THE UNIVERSITY OF THE WESTERN CAPE

In the Best Interest of the Child: Food Choices and Body Mass Index of Adult and Children Living in Urban Peripheral Townships in Cape Town

By

BELEBEMA MICHAEL NGUATEM

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Supervisor

PROF MULUGETA F. DINBABO

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DEDICATION

To late Professor Zacharia Tanee Fomum who said:

"I cannot send you to the mission field unless you have at least a Master Degree"

DECLARATION

I, Michael Nguatem Belebema, hereby declare that the work on which this thesis is based is my original work with the exception where acknowledgements is indicated otherwise and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. The University of the Western Cape may for purposes of academic use produce either the whole or any of the contents in any manner whatsoever.

Signature: ----------Date: ----------30th----------June 2020

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KEYWORDS

- Child
- Body Mass Index
- Food choices
- Rights
- Obesity
- Best Interest
- Khayelitsha and Mitchells Plain
- South Africa
- Cape Town

ACRONYMS

BMI	Body Mass Index
COCT	City of Cape Town
CSG	Child Support Grant
CRC	Convention on the Rights of the Child
DDS	Dietary Diversity Score
DG	Disability Grant
DOH	Department of Health
EAs	Enumeration Areas
FAO	Food and Agriculture Organization
FCG	Foster Care Grant
HBP	High Blood Pressure
GDP	Gross Domestic Product
GHS	General Household Survey
GPAQ	Global Physical Activity Questionnaire
HSRC	Human Sciences Research Council
ICESCR	International Covenant on Economic, Social and Cultural Rights
ISD	Institute for Social Development
LMIC	Low and Middle-Income Countries
MRC	Medical Research Council
NIDS	National Income Dynamics Study

NSNP	National School Nutrition Programme
OG	Old Age Grant
PNAE	National School Meal Programme
PSNP	Primary School Nutrition Programme
RDP	Reconstruction and Development Programme
RIA:	Research ICT Africa
SALDRU	The Southern Africa Labour and Development Research Unit
SANHANES	South African National Health and Nutrition Examination Survey
SFPs	School-Feeding Programmes
SEM	Social-Ecological Model
StatsSA	Statistics South Africa
SCT	Social Comparison Theory
RTJ	Rawls Theory of Justice
UWC	University of the Western Cape
WHO	World Health Organization
YRBS	Youth Risk Behaviour Survey

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ABSTRACT

Background: The increase in overweight and obesity worldwide is described as a global health epidemic. A great proportion of this epidemic is now found in low- and middle-income countries with higher levels of prevalence, particularly in emerging economies. In sub-Saharan Africa, South Africa ranks high in the prevalence of obesity at all levels. Since the inception of democracy in 1994, the government is yet to overcome the burden of poverty and inequality routed in its apartheid past. Apartheid systematically and unjustly disintegrated and segregated black Africans and people of Colour, denying them access to economic opportunity, thus leaving them on a dependency status. Khayelitsha and Mitchells Plain are the relics of apartheid policies. Obesity and associated diseases are highly correlated with gender dynamics, economic conditions, nutritional status, poverty, and urbanisation. It is increasingly evident that poor urban dwellers, especially women and children are at risk of obesity-related factors such as diabetes, hypertension, and heart diseases. The increasing incidence of obesity especially amongst children is concerning. The prevalence of child poverty is in South Africa is a cause for concern. Over 18.5million children are in South Africa, 64% of which are dependent on CSG. With poverty and inequality affecting millions of households, access to food and quality food has reached crises level. Yet, it is a basic human right that has received little empirical response amongst policymaker in South Africa. The South African food system is complex, poverty is endemic and poor households are most vulnerable to unhealthy eating habits. This research critically analysis the link between food choices, overweight and obesity in adults and children living in urban peripheral communities in Cape Town. The study was designed to interrogate the kinds of food eaten by urban peripheral dwellers, their socioeconomic status and how the policy of the BIC addresses the problem of child obesity in South Africa.

Aim: This research aimed to empirically explore the relationship between BMI and food choices of adults and children living in urban peripheries in Cape Town. The study also aimed at evaluating the BIC in urban townships in Cape Town in the context of child obesity, to understand the views of the children and to understand how poor households are ensuring the BIC in relation food access, food availability and child protection from obesity. The study further aimed at comparing the and contrasting the socioeconomic dynamics of the two population to understand the progress and gaps in their economic and health status.

Method: Empirical data were collected from households in Khayelitsha and Mitchells Plain using a two-stage sampling technic to identify clusters and households. A sample of about 4300 individuals in 1052 households was sampled. A 24H dietary recall was used to capture food types of the population. The World Health Organisation guidelines for BMI adults and children were applied through the study. A BIC Index was developed to assess the right to food from the views of the child.

Results: First, the study found significant differences in the socioeconomic and demographic profiles of the population. Poverty and the risk of falling into poverty were higher in Khayelitsha than in Mitchells Plain. Two-third of the population (65%) of adults we found to be overweight and obese. Overweight and obesity amongst children was 29% and 68% of children reported that they buy food at school or on their way to school. Over 83% children stated that their parents give them money to take to school. There was a significant association between children buying food and parents giving money at X^2 *91.4643, P<= 0.000. C*arbohydrate represents 40% and sugar 35% of food types children eat away from home. In terms of the BIC, 43% of the children

affirmed that their best interest is considered at home, 31% said their best interest sometimes considered and 26% said their best interest is never considered.

Conclusion With the current state of obesity in South Africa and the study area, in particular, this study adds to the numerous voices for an intervention strategy to address the obesity problem in the country. Children remain vulnerable to unhealthy food types like their parents. Given the evidence of a difference in the two populations, government policies for poverty alleviation, socio-economic development of communities, and access to basic services must consider that there is a gradual departure from poverty while others fall into greater levels of destitutions. The current school feeding scheme should be redesigned to feed children with food high in micronutrition considering that there is already a high level of carbohydrate consumption at the household level. Lastly, for the BIC, there must be continuous monitoring and evaluation in terms of food access and food availability in poor households. The study concludes that there is a need to develop a framework on the BIC outside custody. Developing the Best Interest Standard from a social science perspective and including overweight and obesity in the list of risk factors will improve monitoring and reporting for the best interest of the child.

Chapter 1

INTRODUCTION TO THE STUDY

1.1 Introduction

There is an international wakeup call for the monitoring of the rising trends of overweight and obesity worldwide. In the World Health Organisation (WHO) 2015 report, worldwide obesity has doubled since 1980. More than 1.9billion adult ages 18 and older were overweight in 2014 of which 600million were found to be clinically obese (WHO, 2015). The focus of this research was to assess the prevalence of overweight and obesity in adults and children living in Khayelitsha and Mitchells Plain. The research was set out to evaluate how the food choice of urban peripheral dwellers contribute to their health status, measured using Body Mass Index (BMI) and the population's socio-economic circumstances. The study builds on the concept of Human Rights to food and argued that the poor eating lifestyle of parents is a consequence of childhood obesity and therefore impacts the Best Interest of the Child (BIC).

Empirical data were drawn from two racially distinct populations for the study but which have observably homogenous socioeconomic characteristics. The study examined the demographic and socioeconomic profiles of the populations. It further identified the food choices and food sources of the population. First, it assessed households' profiles of the study area and quantitatively examined the extent of the prevalence of overweight and obesity amongst the adult population. Secondly, it assessed the children's food choices in the context of social justice and critique on the application of the current principles of the Best Interest of the Child (BIC) framework in South Africa. The objective was to understand children's immediate environment and household conditions to ascertain if poor households are capable of implementing the BIC principles as provided by the Convention on the Rights of the Child 1989, Constitution of South Africa 1996, and the South African Children's Act 38 of 2005.

This chapter provides a general overview of the study by way of introducing the study, giving a contextual background of the study and its significance. The chapter situates the study in the current geopolitical strata of the Cape Town and shows the implications of apartheid policies on population health after more than 20year of emancipation from the system. To do so, an overview of the population is provided in terms of geographical location, population, education, economic status, health status, to guide the reader to the study. Lastly, the significance, aims and objectives, the research questions and the chapter outlines are discussed.

1.2 Background of the study

Obesity is described as a global health epidemic that continues to pose serious health challenges and contributes significantly to the prevalence of NCDs and impacts on the economic and social wellbeing of people worldwide (Kengne, et al., 2013; Wang and Beydoun, 2007). The incidence of obesity affects not only developed countries, but current trends continue to show increased prevalence in Low and Middle-Income Countries (LMIC)(Bigna and Noubiap, 2019; Gowshall and Taylor-Robinson, 2018; Okop, 2017). Over 2.1billion people, 30% of the world population is overweight and obese (WHO 2015). It is becoming increasingly clear that many of the LMICs, already strapped into poverty and malnutrition face a double burden of malnutrition and undernutrition; on the one hand, and obesity and NCDs threats on the other (Popkin and Slining, 2013; WHO, 2016).

The challenge of reducing obesity in the world for the past three decades has yielded no positive result as there is no evidence in any country that obesity is reducing (ng et al., 2014). This calls for policy reforms to ensure that obesity is targeted from the childhood level.

Several reasons have been posited for contributing to the global spread of the pandemic. According to the WHO (2015), though the reasons for the spread of obesity needs to be fully understood, empirical evidence shows that obesity is a function of overconsumption of energy-

dense food types and the excessive accumulation of body fat that poses a risk to health. People suffering from overweight and obesity are at risk of contracting Non-communicable Diseases (NCDs) such as hypertension, dyslipidemia, Type 2 Diabetes (T2D), heart disease, stroke, sleep apnea as well as cancers of the endometrium, breast, prostate, and colon (Cecchini et al., 2010).

The epidemic of overweight and obesity diverts scarce resources for the management and prevention of diseases and impacts on population ability to be productive at the workplace and decreased turnover (Tugendhaft and Hoffman, 2014). The cost of obesity and associated diseases impact on individuals and the State and reduces the population's social and economic wellbeing. It is estimated that the global cost of overweight and obesity in 2014 translates to up to Two Trillion Dollars ($2trillion) and constitute to global GDP of 2.8% (Dobbs et al., 2014).

Obesity is a corollary of malnutrition, undernutrition and poor eating lifestyle. It is highly associated with urbanization, poverty, and inequality. Worldwide malnutrition status is rapidly falling and South Africa is one of many countries affected by this global trend. While children are the most vulnerable to malnutrition and undernutrition, the changes in the global food system are creating a paradigm shift toward highly processed energy-dense food (Vandevijvere, et al., 2015).

Furthermore, despite numerous attempts at overcoming the scourge of overweight and obesity, little is known especially from a South African context on the application of policies that are directly or indirectly linked to fighting obesity. Given that the South African government has established certain legislative frameworks for food and nutrition security, the majority of these legislations relating to food and food access are largely focused on food security in terms of access. These legislations fall short of addressing nutritional quality. Without an appropriate policy framework to address food and malnutritional quality and access, poor households in urban peripheries will continue to bear the brunt of malnutrition, overweight and obesity.

A major concern is an increase in the prevalence of overweight and obesity in children (WHO, 2008). Child obesity is also on the rise worldwide. Lobstein, et al. (2015) state that the rate of worldwide child obesity has risen substantially in less than one generation. In the US, average child weight has risen to more than 5kg in more than three decades. In 2014, 42 million children under the age of 5 were reported to be clinically obese (WHO, 2015). The policy response to child and adult overweight and obesity has received very minimal attention.

In Africa and in many developing countries where fatness is perceived as evidence of good living, there is likely to be a very limited response from policymakers. Nutritional policies have to be able to substantially improve child and adult health and reduce overweight and obesity. Evidence from Limpopo province in South Africa shows that out of 72% of people who were found to be obese, only 14% acknowledge they were clinically obese (Ramukumba, Wright & Hoffmann 2013). This kind of evidence of the adult perception of overweight and obesity still needs to be tested nationally to ascertain the level of adult perception of their weight and obesity and to inquire whether such perceptions are linked to their state of poverty, educational background or if it is associated to cultural stereotypes and social exclusion.

More so, there is little or no evidence in South Africa with respect to children's perception of obesity. Children's perception of overweight and obesity has not been critically assessed yet there is growing evidence of child obesity in South Africa. Targeting child overweight and obesity should form part of South Africa's government policy on the BIC as stipulated in the Children's Act 38 of 2005.

1.2.1 Obesity and associated factors

Overweight and obesity are not isolated conditions that can be treated or studied independently. Obesity is linked to human behavior, economic and social conditions of a community, peoples, cultural factors, and nutritional knowledge. In terms of human behaviour, perception of body

size, cultural and traditional believes systems are important contributing factors of weight gain (Bosire, et al., 2020; Mchiza, et al., 2020). Association of this poor perception of body image is not only common to develop countries but is deeply entrenched in the rural communities and townships in South Africa (Okop, 2017).

Nutritional knowledge plays a key role in managing overweight and obesity. Nutritional imbalances, unhealthy eating habits, sedentary lifestyle and lack of physical activity. Several studies have pointed to the impact of nutritional insecurity, imbalances manifested in the overconsumption of energy-dense food types without a corresponding energy expenditure (Boatemma et al., 2018; Muzigaba et al., n.d.; Vorster et al., 2005a; Weker et al., 2011; Wenhold and Faber, 2008; Williams and Suchdev, 2017). Thus, where such knowledge is absent, the probability of an increase in weight is unavoidable.

Moreover, the incidence of weight gain is further worsened by various socioeconomic conditions of the households within a community. In sub-Saharan Africa and South Africa in particular, socioeconomic disadvantage population are most vulnerable to the obesity epidemic (Akpa et al., 2020; Matos et al., 2020). With high levels of poverty and inequality in South Africa, access to food and nutritious food, access to a safe environment for physical activity are major obstacles even to various intervention methods to reduce obesity (Akpa, et al., 2020.).

Food Choices and Body Mass Index (BMI) in adults and children are seen as an 'important channel that would enable poor households to live a healthy life and, ultimately lead to societal transformation and higher economic growth at the national level and international level. However, several studies on obesity clearly show a growing global epidemic creating increase social dysfunctions (Kengne, Echouffo-Tcheugui, Sobngwi & Mbanya, 2013; Kruger et al., 2005; Prentice, 2005; Puoane et al, 2002; WHO, 2008; Ziraba, et al., 2009). It is associated to diseases contributing to the cause of many health problems including heart disease, stroke,

diabetes and some types of cancer and poses a serious public health challenge worldwide (de Onis et al, 2010; DOH, MRC & OrcMacro, 2007).

Obesity is on the rise in South Africa and is amongst one of the highest in the African continent. Obesity affects all age groups. The challenge is that the majority of citizens do not seem to perceive obesity as a health risk or problem (HSRC & MRC, 2013). For example, Skaal & Pengpid (2011) in their survey of healthcare and non-healthcare workers in South Africa found that about 37.5% were obese and 9.5% were severely obese but that more than 55% of them perceived their weight as being normal whilst 56% (health care workers) and 61% (non-healthcare workers) were satisfied with their current body weight. In general, little is known about the outcomes of BMI measurement programs, including effects on weight-related knowledge, attitudes, and behaviours of children and their families in South Africa. As a result, no consensus exists on the utility of BMI screening programs for children, the youth and adults. Several researchers in the field have concluded that insufficient evidence exists in relation to people's self-perceived health status and actual measurements (e.g. Kengne, Echouffo-Tcheugui, Sobngwi & Mbanya, 2013; de Onis et al, 2010; Ziraba, et al., 2009).

1.2.2 Household Poverty

The implication of poverty on the health of the poor in poor communities is not new. In the United State of America, cholera deaths during outbreaks in 1832 and 1854 were found to affect the poor disproportionately leading to the enactment of the \metropolitant health Law to improve Sanitary conditions in the Metropolis (Chokshi, 2018). Poverty and unhealthiness are described as the root cause of rural china ((Zhou et al., 2020).

Statistics in 1995 showed that South Africa suffered food poverty at a rate of 47% (Rose and Charlton, 2001). Darmon, Ferguson & Briend (2002) observed that food poverty is the result of economic constraints on households. A recent study in South Africa scientifically linked

household asset poverty and proposed that changing the status of poverty in South Africa will require policies that improves income assert through employment generation programmes. This has high bearings on food choices of households living in urban peripheries. Cater & May (1999) argue that using the household income-based poverty measure is deficient and impervious to differentiate in intra-household inequalities. They argue that the average food intake of an individual comes closer to measuring poverty and wellbeing. Recent studies show that obesity in South Africa is not limited to adults. Pienaar (2015) found that obesity amongst children aged 6 to 9 years increase by 4.2% over three years. According to the study, obesity increased amongst boys than among girls, a phenomenon that completely deviates from common perceptions that females are susceptible to obesity than males. Understanding the perceptions of children and their parents could contribute to our understanding of the relationship between food choices, overweight and obesity amongst those living in urban peripheral townships in South Africa.

This study, therefore, seeks to assess the relationship between food choices and Measured Body Mass Index (BMI) in in the context of the right to food in South Africa. It was designed to scientifically develop evidence that will contribute significantly to understanding the right to food as a basic human right but more to evaluate these rights from the point of view of the children's best interest focusing on children living in peri-urban townships in Cape Town.

1.2.3 Significance of the study

Obesity and associated diseases are placing a burden on healthcare systems globally. In South Africa, cognisance of the pervasiveness of poverty and inequality, children and adults living with obesity face a double burden (Seidell and Halberstadt, 2015). Bjornstad & Nadeau (2014) have classified childhood obesity as a double burden to households. Children suffering from overweight and obesity have a higher probability of being obese in adulthood and are at risk of NCDs such as hypertension diabetes mellitus, osteoarthritis, and coronary heart diseases in the later stage in life (Berry et al., 2018; Korn et al., 2013; Scott et al., 2013).

Government expenditure in the past 10years has risen to more than R23billion for treating illnesses directly linked to obesity. It is estimated that expenditure on non-communicable lifestyle diseases treatment will soon exceed that of infectious diseases (Mapumulo, 2015).

From 2008 to 2013, obesity amongst South African women was recorded as the highest in sub-Saharan Africa (Ng, et al., 2014) and over one-third of women in South Africa age 15 and above were found to be clinically obese using a nationally representative sample (DOH, 2015).

Furthermore, evidence from the National Income Dynamics Study indicates that 39% of women were classified in 2015 as obese compared to 11% of men (DOH, 2015). With respect to children, Shisana (2013) found that 18% of children 2 to 5 years were overweight and 6 to 14 years old, overweight and obesity combined was 13% which exceed the global average of 10%.

Overweight and obesity, especially amongst the poor and economically disadvantaged in Khayelitsha and Mitchells Plain, poses a significant threat to the long-term health and wellbeing of the children and adults. The burden of disease, the increasing cost of health care, and the dependence on social grants will only compound the burden of obesity. Day and Gray (2016a) states that policy formations to address the problem of morbidity and mortality are either inadequate adequate or have completely deteriorated in South Africa. There is insufficient evidence in the literature relating to the contextual challenges of different socio-economic groups relating to food consumption patterns and behaviours in the South Africa context.

Few policy actions taken to reduce child vulnerability such as the Child Support Grant have contributed significantly to reducing child poverty. However, the policy is sufficient to completely eradicate child malnutrition. This study explores the significance of the food choices of adult and children in relation to the Best Interest of the Child. The study addressed some of the gaps in the literature and provide evidence-based information on the reasons for this obesity pandemic, thereby supporting and strengthening current government efforts to improve the health status of

the poor in South Africa.

1.3 Problem Statement

The implication of food choices on health is not new yet sufficient attention has not been given to investigate the links between food choices and obesity. The growing number of children affected has become a cause for concern. In addition, the impact of adults and caregiver's food choices on children's health is under-researched in South Africa. Studies have shown that food choices, perception of fatness, poverty and the growing urban peripheries, are impacting on the health of urban peripheral dwellers in the form of overweight and obesity.

Studies have shown that obesity is a growing global epidemic (Kengne, Echouffo-Tcheugui, Sobngwi & Mbanya, 2013; Kruger et al, 2005; Prentice, 2005; Puoane et al, 2002; WHO, 2008; Ziraba et al 2009), which is turning into a new social problem. The WHO (2015) and other scholars (Lobstein et al., 2015; Ng et al., 2014; Wang and Lobstein, 2006; H. Yatsuya et al., 2014) have acceded to obesity as a global epidemic. These studies have also shown that obesity is no longer a developed country problem but now affects all countries of the world. In addition, obesity and overweight have cross the boundary of being an adult issue to affecting children and in some cases whole families. In 2013, WHO report states that 41 million children were obese worldwide and more than half of them (31million) living in developing countries.

Even though studies have been carried out on obesity and overweight worldwide to determine both its scientific and psychosocial cause and effect, there is still limited empirical research in sub-Saharan Africa and South Africa in particular that explains the logical and underlying factors leading the current rise in overweight and obesity in South Africa (Dinbabo, et al., 2019; Kengne et al., 2013; Matthiessen et al., 2008; Ng et al., 2014; Onis et al., 2010).

Overweight and obesity are associated with diseases contributing to the cause of many health problems including heart disease, stroke, diabetes and some types of cancer and poses a serious

public health challenge worldwide (Asfaw, 2005; de Onis et al, 2010; DOH, MRC & OrcMacro, 2007, Hill, 1999). A major concern is a dramatic and continuing increase in the prevalence of overweight and obesity in children (WHO, 2008). (Onis et al., 2010) state.s that "in 2010, overweight and obesity were estimated to cause 3·4 million deaths, 3·9% of years of life lost, and 3·8% of disability-adjusted life-years (DALYs) worldwide"(Onis et al., 2010, p. 1).

The paradox, however, is that while recent reports show a fall in poverty rates, undernutrition and improve healthcare worldwide, there is an observable rise in body weight in the countries where undernutrition and hunger are reported to have fallen significantly within the last two decades (Onis et al., 2010).

Obesity is on the rise in South Africa and is amongst one of the highest in the African continent. The may South Africans do not seem to perceive obesity as health risk (HSRC & MRC, 2013). This sociocultural perception of body weight is driving and impacting on the population. Puoane et al. (2002) carried out a study on the prevalence of overweight and obesity in an urban township in Cape Town and found that over 71% of females compared to 23% of men suffered from abdominal obesity. The results further showed that generally, 53.4% and 18.7% of females and males respectively were reported obese. In addition, Skaal & Pengpid (2011) in their survey of healthcare and non-healthcare workers in South Africa found that about 37.5% were obese and 9.5% were severely obese but that more than 55% of them perceived their weight as being normal whilst 56% (health care workers) and 61% (non-healthcare workers) were satisfied with their body weight.

The policy response to the problem of obesity is yet to reflect the growth rate of this eminent heath risk, and not much is known about the results of BMI measurement programs, which includes understanding weight-related knowledge, attitudes/behaviours of youths and their families in South Africa. As a result, no consensus exists on the utility of BMI screening

programs for children, the youth and adults. Several researchers in the field have concluded that insufficient evidence exists in relation to people's self-perceived health status and actual measurements yet such knowledge is not translated into policy reforms (e.g. Kengne, Echouffo-Tcheugui, Sobngwi & Mbanya, 2013; de Onis et al, 2010; Ziraba et al 2009).

The policy response to targeting obesity in South African does not substantially measure up to the problem. (Igumbor et al., 2012) state that children under 16 are not allowed to be exposed to food classified as "non-essential to a healthy lifestyle" to a healthy lifestyle under the Foodstuffs, Cosmetics & Disinfectants Act 54 of 1972 as Amended in March of 2010. Several other pieces of legislations have been put in place to regulate food access and food quality in a bid to protect consumer health. However, implementation of these legislations and policies are short of responding to the problem. Even though certain foodstuffs have been identified and declared unhealthy they still dominant in the South African market (Igumbor et al., 2012). Igumbor et al., (2012) concluded that multinational and national food industries are aware of the health risk of their products and have developed interventions that are not a response to changing their product content but have focused on consumer behaviour which outcome is yet to be evident in the population.

Given that behavioural change and not the absence of knowledge of the disease could be the key factor driving obesity in South Africa, this study takes a look at the problem from a right-based approach. The study contended that if the same rigour given to the protection of children in custody circumstances is applied to protect children from obesity, the long-term outcome will be significantly beneficial.

Train a child in the way he should go, and when he is old he will not turn from it (Proverb 22:6)

Overweight and obesity in South Africa is still perceived as an adult problem. There is no legal framework that currently protects children from becoming overweight and obese. In addition,

legislation regulating the food industry rarely focus on children nor does it consider obesity as a health risk for children. Moreover, South Africa is a country where fatness is glorified and obese children are admired as evidence of good living. It is therefore imperative to investigate the association of parental food choices and child overweight and obesity in Khayelitsha and Mitchells Plain. This study contributes to the knowledge of the link between poverty and obesity in urban townships in Cape Town. It further shows the absence of a strong legislative framework that seeks to protect children from overweight and obesity and how the best interest of the child framework can contribute in ensuring that children are protected from poor food choices. The study hypothesized that parental food choices, obesity, and the absence of a strong legislative policy for preventing child obesity are the key drivers of unhealthy lifestyles amongst school-going children which infringe on their right to health.

1.3.1 Aim of the research

The aim of this research was to empirically explore the relationship between BMI and food choices of adult and children living in urban peripheries in Cape Town. It also aimed at comparing the food choices of children by identifying the kind of food children eat at home and away from home and to evaluate the right to food in the context of the Best Interest of the Child.

1.3.2 Specific objectives

The study seeks to:

- To measure the prevalence of overweight and obesity in Khayelitsha and Mitchells Plain;
- Identify an appropriate theoretical and conceptual framework for the study;
- identify the kinds of food that are consumed by urban peripheral dwellers;
- evaluate the children's right to food in the context of the Best Interest of the Child;

- identify critical differences between the two population in the context of its socio-economic and health status;
- identify the relationship between food choices, self-perceived health status and actual BMI measurements;
- measure children food choices outside of the home and parental control;
- Propose policy recommendation that response to child overweight and obesity in South Africa.

1.3.3 Research questions

- How different is the population of Khayelitsha and Mitchells Plain in terms of their socioeconomic and health status?
- What kinds of food are consumed in the study area and what are the implications on the health of the population?
- What is the relationship between food choices, self-perceived health status and actual measurement (Body Mass Index) scores?
- What is the effect of parental influence on children's food choices?
- Does the Best Interest of the Child policy in South Africa addressing child obesity?
- What are the critical policy gaps in addressing child overweight and obesity in South Africa?

1.3.4 Delimitations of the Study

This study was carried out to test the relationship between food choices and BMI in poor communities in Cape Town. Thus, the main point of departure as stated in the methodology and

the research objectives as well as in the description of the study area, this research is limited to Khayelitsha and Mitchells Plain in Cape Town South Africa. Though the study provides a description of the theoretical model applied through the study in association with the concept of justice, the study was not designed to develop such legal framework for preventing obesity amongst children as stated in chapter eight. In this context, the main issues discussed were limited to South African policy on child protection corroborated by international laws, treaties and conventions.

1.4 Chapter Outline

This study is divided into ten chapters which are presented as follows:

Chapter I introduces the study and makes clear the gap between Food choices and Body Mass Index (BMI) in adults and children. Thus, it highlights the context and rationale of the study. It also states the problem statement, research questions, hypothesis, the aims and objectives.

Chapter II presents an overview of background information about the case study area, i.e. Mitchells Plain and Khayelitsha. The objective was to provide the reader with a background of the study area which helps inform the context of poverty and inequality highlighted through the study.

Chapter III gives the various perspectives of the literature consulted on the current knowledge on Food choices and Body Mass Index (BMI) and presents a discussion of these perspectives. It aims to give a background to the study and build a logical framework for the research.

Chapter IV provides the theoretical and conceptual framework of the study. This chapter provides various perspectives of the Social Ecological Model (SEM) and Social Comparison Theory as well as Rawls Theory of Justice. The chapter provides a clear and logical understanding of the relationship between food choices, BMI, and peoples socio-ecological and socio-comparative influences.

Chapter V focuses on the research methodology and the analytical tools that have been employed throughout the thesis. In general, the chapter presents the methods used for determining the analysis of data, interpreting results that answer the various research questions, and testing the research hypothesis in the study.

Chapter VI presents the socio-demographic profile Khayelitsha and Mitchells Plain. The chapter introduced household characteristics, analysis of access to basic social services, determinants of food choices is made, an analysis of weight management practices and assesses the overall health status of respondents. It also showed the differences between the two populations.

Chapter VII is an assessment of overweight and obesity in the case-study area. The presents the findings on the prevalence of obesity, the relationship between food choices and BMI, and weight management characteristics of the populations.

Chapter VIII generally focused on child obesity, children eating habits, and examined children's food choices away from home and its associated risk. The chapter also builds on the principle of the BIC.

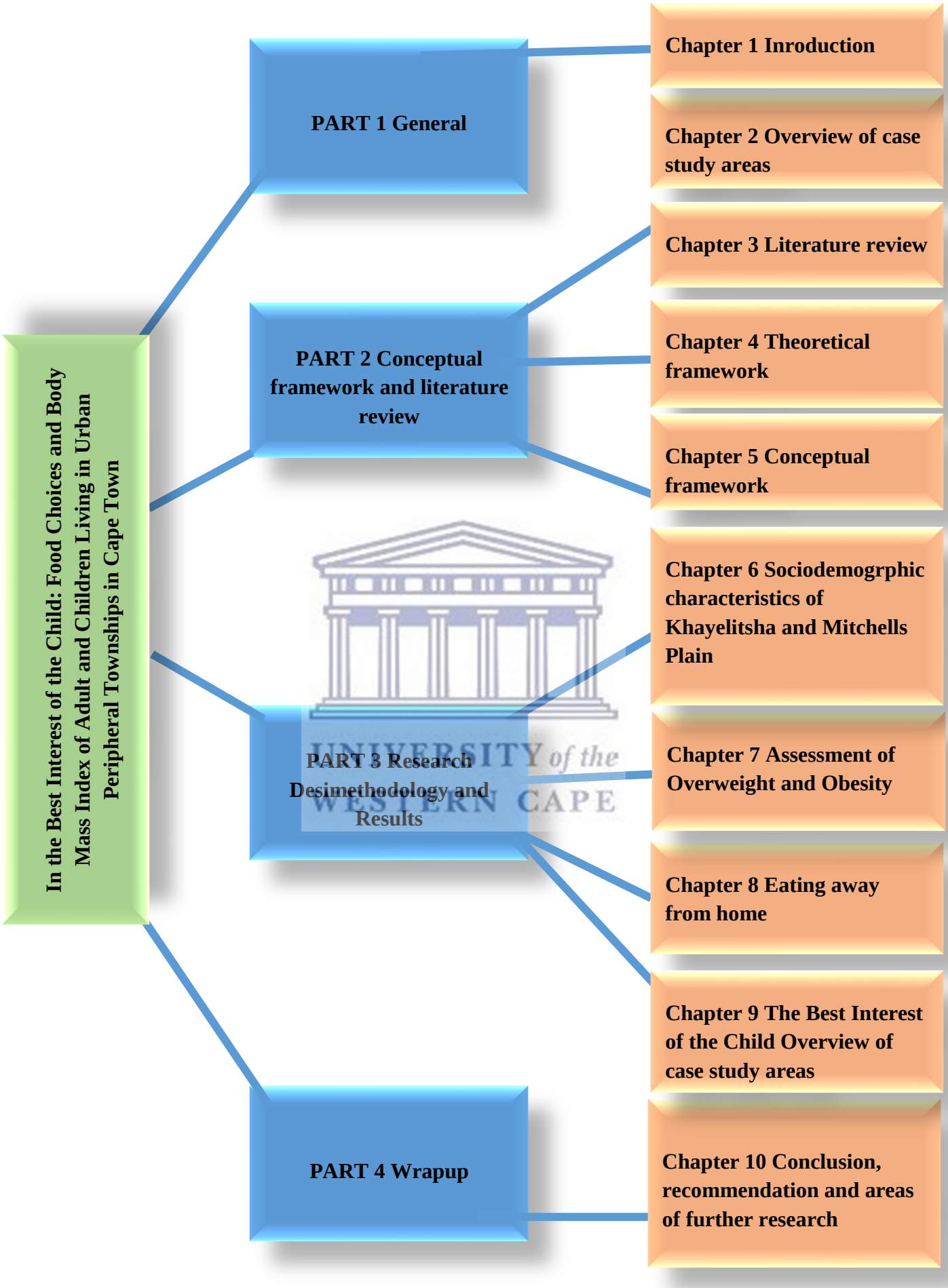
Chapter IX is based on an analysis of the best interest of the child. The chapter examined the CRC, the South African Constitution, The South African children's Act 38 of 2005. The main objective was to quantitively develop the BIC index that assesses the child's rights to food.

Chapter X has provided the conclusion of the study, the research summary, the research gaps and the contribution of this research to knowledge.

1.5 Conclusion

This chapter has provided a general overview of the research in the form the background, the context of the study, the rational and significance, the problem statement and aims and objectives including the main research questions and chapter outline. It briefly developed from a global

perspective of obesity, showing the linkages between obesity and associated causal factors, which are not independent of human and cultural behaviours of people and their socioeconomic and geographical location. The chapter briefly reviews current and past studies on the obesity pandemic and how it relates to this study as a situational context. It also provides the rationale for the study, the statement of the problem of weight gain in globally and South Africa in particular to show the significance of the study and the motivations thereafter. In addition. It defines the research question; the research aims and objectives as well as the outline of the study as a measure to guide the readers. Chapter 2 develops a historical and socio-political transformation in the case study area. The chapter informs an in-depth literature review that spans from food security and obesity globality down to the South African context. Then, it establishes the links between current socioeconomic conditions and policies affecting the health and wellbeing of these communities.



Chapter 2

OVERVIEW OF CASE STUDY AREAS

2.1 Introduction

Khayelitsha and Mitchells Plain are two large urban peripheral Townships located in the outskirt of Cape Town's City Centre. The two Townships were created by Apartheid government as a strategy to limit and if possible prohibit completely the influx of Black Africans and coloured people to the what was known as "White South Africa"(Cook, 1986). The implementation of the Group Areas Act of 1957 marked the beginning of racial segregation that has made Cape Town the most racially segregated city in the whole of South Africa (Lemon, 1991; Saff, 1998; Watson, 1999). Apartheid created systemic social disintegration through its policy of segregation. This later translated into high levels of poverty and inequality(May and Govender, 1998), whose impact on the health of the poor is yet to be fully measured(Rose and Charlton, 2002a).

The impact of apartheid policies is yet to be fully eradicated in South Africa generally and in Cape Town in particular. Khayelitsha and |and Mitchells Plain were the first move of the Apartheid government in cape town to implement the Group Ares Act which allowed for the government to relocate Black Africans and Coloured people away from the City (Christopher, 1990; Saff, 1998). Early census results indicated that by 1960, over 60000 Black Africans were living in Cape Town. At the creation of the Khayelitsha, about 30000 Black Africans were moved to Site C in Khayelitsha as the first cohort of the implementation of the Group Areas Act of 1950 (Cook, 1986).

This chapter focuses on the Black and Coloured residential areas of Cape Town to establish the links between current socioeconomic conditions and policies affecting the health and wellbeing of these communities. (Skuse and Cousins, 2007) describes the creation of Khayelitsha as making an unhealthy place. Highlighting the background of Khayelitsha and Mitchells Plain gives insight

into the current prevalence of overweight and obesity in association to NCDs and racial segregations of the past which has culminated to increase health inequalities.

2.2 Khayelitsha

2.2.1 Location and settlement history

Khayelitsha is located about 36 kilometres outside of the City of Cape. The township has a surface area of about 38.71 square kilometres (Western Cape Government 2013; City of Cape Town, 2013). Khayelitsha shares a common boundary with Mitchells Plain to the west, Macassar to the East and Mfuleni to the North. It is commonly identified within the region described as the Cape Flats. Similar to Mitchells Plain, Khayelitsha is part of Cape Town Municipality which spans from the Table Bay to False Bay in the Western Cape Province of South Africa.

The name Khayelitsha means "New Home" in isiXhosa language. At the declaration of the creation of the township, there already existing over 206 482 Black Africans residents in Cape Town of which 23 083 were migrant workers predominantly from Eastern Cape Province or former Transky regions (Cook, 1986; Lemon, 1991).

The Group Areas Act of 1950 was used by the apartheid government to facilitate racial segregation policies (Standing, 2003; Petersen et al., 2020). The predominantly Black African community was created by the apartheid government under the Group Areas Act in 1950 with the objective to segregate people of colour from the inner city. According to DeGuzman et al. (2013) and Landrine and Corral (2009) racial segregation exacerbates negative health outcomes amongst the marginalised population. Blacks have been found to have the worst health outcomes compared to other racial groups (Christopher, 1990; Jacobs and Du Plessis, 2016). The Act provided for city planners to delineate the city according to the racial and economic status which led to the creation of a predominantly Black neighbourhood and Coloured neighbourhoods. Lemon, (1991) state that there was a strong correlation between skin colour and economic status. People with darker skin

colour were relocated in Khayelitsha and had a lover and deplorable living conditions. Despite the political shift that South Africa entered into since 1994, communities like Khayelitsha is yet to be come out of the clutches of apartheid policies. The township remains one of the poorest and marginalised in the City of Cape Town(Du Toit and Neves, 2007; South African History Online, 2016).

Figure 2-1 Khayelitsha in the Map

Source: Map of Khayelitsha and surrounding townships (Source: Chief Directorate Surveys and Mapping, Department of Land Affairs) (Legg, 2010)

According to Statistic South Africa, (2011) Khayelitsha is clustered into of 28 sub-places which covers several enumeration Areas. Khayelitsha has 12 local wards governed by three local government sub-councils. Whereas Legg (2010) reported that household sizes were 5.6, reports from the City of Cape Town and Statistics South Africa report that there were over 118 800 households in Khayelitsha with an average household size of 3.30 members (City of Cape town, 2013; StatsSA, 2020). This household size has increased over time. Current average household

size is estimated at 5.6p person (Legg, 2010). But more to it is that about 54% of the population live in shack and backyard dwellings which depict the level poverty and inequality and segregation that the people have been trapped into for over four decades (City of Cape Town, 2013)

Post-apartheid Khayelitsha has sprawled in the Cape Flat covering approximately 50 km^2 of densely situated formal and informal settlements that spreads right to the costal boundaries. Formal dwellings are comprised brick houses (Legg, 2010). There also is a proliferation of government brick hose also call RDPs housing (City of Cape Town, 2008). The majority of Khayelitsha population (62%), live in informal settlements comprise of shacks built of corrugated iron, plastic, rejected woods from construction sites erected mostly on municipally serviced land (Legg, 2010).

2.2.2 Khayelitsha population profile

The demographic profile of Khayelitsha is critical to understanding the dynamics of poverty and inequality, food security and health status of the population. The demographic profiles look at the household characteristics in terms of gender, age, race and language (StatsSA, 2013). The Khayelitsha township is densely populated which could have a huge implication on the population health. Population density, neighbourhood walkability are critical indicators of population health (DeGuzman et al., 2013). Research has shown that there is a strong correlation between population health and population density (Lovasi et al., 2009).

Census in 1960 revealed that the population of Khayelitsha was about 60000 black residents and was estimated to grow by 6.8% to 180400 by 1980 (Cook, 1986). According to Statistics South Africa, the population of Khayelitsha is estimated 391,749 according to the census 2011 data (StatsSA, 2011). Discrepancies concerning statistical reports of Khayelitsha are not only limited to household characteristics. According to Census 2001, Khayelitsha population was estimated at 329 000 (StatsSA, 2001), in 2011 census, Statistics South Africa estimated the population to be 391,749 (StatsSA, 2011) thus indicating a growth of about 62 749 in 10years.

One of the major factors for the increase in the population of Cape Town and the Western Cape, in general, is in-migration. Dinbabo et al. (2018) state that the biggest influx of migrant to the Western Cape is from Eastern Cape Province. Jacobs and Du Plessis (2016) found a strong migration stream from the Eastern Cape to the Western Cape with a significant proportion of the migrants' age 25 to 29 and largely uneducated coming to seek jobs. This has contributed to the swelling of the Khayelitsha township population. Khayelitsha has a density ratio of 42.5 and a population density of 10120 persons /km^2. Since the mid-1950s the population of Khayelitsha has been growing exponentially. Despite Stats SA reports, there are still controversies as to what the actual population size of the township is. Some studies hold that the population is about a million people live in Khayelitsha (Seekings, 2013).

Since the enforcement of the 1950 Group Areas Act that led to the creation of Khayelitsha for Black Africans, the population remained predominantly 90% Black Africans. Since its creation, the township has sprawled over a 50km^2 landscape with a mixture of formal and informal dwelling types(Cook, 1992, 1986; Legg, 2010). Formal housing is characterised of small brick build type material or cement blocks popularly referred to as RDP houses. The Reconstruction and Development Programme (RDP) were initiated in 1994 as one of the first democratic policy initiatives by the new ANC government to begin taking people out of poverty and destitution and homelessness (Legg, 2010). Informal housing account for 62% of housing types in Khayelitsha (City of Cape Town, 2008; Legg,2010; Dinbabo, et al., 2017). Informal housing types constitute shacks built on municipal land and in most cases do not have access to municipal services such as refuge collection water and electricity (Residential Growth Monitoring System for the City of Cape Town, 2008). Majority of this population are migrants from the Eastern Cape Province Dinbabo et al., 2018)

Khayelitsha has a relatively young population with about 49% under the age of 25 years. The age group 25-65 constitute about 48% of the population. Gender distribution of the population is not

different from that reported nationally. patterns indicate that 51.1% are females while males make up 48.90% of the population (Dinbabo, (2017). According to Statics South Africa (2011), female-headed households account for 50% of the households. Over the years, South Africa has seen an increase in female participation in the labour market which contributes significantly to the wellbeing of households. Table 2.1 below shows the population of Khayelitsha by race and age. Khayelitsha is predominantly Xhosa speaking and about 95% of the population are from the Eastern cape or were born to parents from the Eastern Cape. Other languages include a very maigre Sesotho at 1.73% and Afrikaans at 1.64% speakers.

Table 2-1 Population by race and age

KHAYELITSA BY RACE AND AGE

Age	African	Coloured	Asian	White	Other	Total
0-4 years	12%	12%	9.60%	7.60%	8.00%	11.90%
5-14 years	16.30%	16.60%	14.70%	14.40%	4.20%	16.20%
15-24 years	21.40%	18.10%	22.40%	17.70%	28.80%	21.40%
25-64 years	48.70%	50.70%	52.20%	55.70%	58.60%	48.80%
65 years and older	1.60%	2.70%	1.10%	4.60%	40.00%	1.60%
Total	98.6%	0.6%	0.1%	0.1%	0.6%	100%

Source: Census, 2011

2.2.3 Public service provision and facilities

When the name Khayelitsha is pronounced within the Western Cape province, and in Cape Town, in particular, the first impression is its informal housing as stated above. The challenge poses by the proliferation of shacks and slum type housing, makes it difficult for the government to provide basic services to the population such as water, sanitation, electricity (Nattrass and Walker, 2005). Whereas those who live in formal houses are most likely to access water in their houses. Table 2.2 shows that 61% of residents have access to piped water in their houses or on their yards. About

71% have access to water system toilet such as flushing toilet, 4% use sceptic toilet, 3.4% use chemical toilet while 6.6% use bucket toilets and 10% of the population have no access to toilets. In the majority of the shack dwelling communities, majority share communal water pipes within a 200metere distance.

Table 2-2: Sanitation in Khayelitsha

SANITATION IN KHAYELITSHA		
Type of toilet facility	**N=118 803**	**%**
Flush toilet (connected to sewerage system)	85 149	71.70%
Flush toilet (with septic tank)	4 878	4.10%
Chemical toilet	4 056	3.40%
Pit toilet with ventilation (VIP)	666	0.60%
Pit toilet without ventilation	693	0.60%
Bucket toilet	7 875	6.60%
Other	3 585	3%
None	11 901	10%
Total	118 803	100%

Source: Census, 2011

Service delivery in the form of water, electricity, toilet system and sewage removal are key elements of population health. The government of the Western Cape has continued to progressively manage service delivery for this urban periphery to the extent that about 80% of the population now have access to waste removal services once a week. Household energy usage has improved (StatsSA, 2020). Minujin and Nandy, (2012) state that household access to energy for cooking is an important socioeconomic indicator of household wellbeing. The population make use of electrical energy for cooking and lighting. Other sources of energy include gas, paraffined and wood (Dinbabo et al., 2017). Paraffine is used as a heating system since it is cheaper than

electricity. However, it is also one of the major causes of shack fires in Cape Town informal settlements.

2.2.4 The Socio-economic structure of the population

Khayelitsha has one of the highest rates of unemployment in Cape Town. Some studies have found that 54 to 60% of young people and more specifically women are unemployed in Khayelitsha (Brijlal and Jere, 2019; Cooper et al., 1991). Education and employment have a strong correlation. About 30% of the population matric qualification. where there are low levels of education unemployment increases. In Khayelitsha, the high unemployment rates are partly because of the low or no education at all. Cooper et al. (1991) note that 39% of women in Khayelitsha only had primary education, 54% had secondary education. Unemployment among these women was 45%. For women who found some form of employment, 66% were Domestic worker and 86% were unskilled.

Unemployment overall stands at 38% is one of the key social problems in Khayelitsha with about 70.2% of the labour force being economically inactive. Seekings (2013) states that the youth unemployment rate was heist amongst Cape Town's Black townships (Seekings, 2013). Education is the key structural barrier to employment as only 30% of the population have acquired a matric qualification. Matric qualification remains the basic requirement for low-skilled, entry-level jobs.

Unemployment in South Africa has soared over the years and residents of Khayelitsha are bearing the brunt of it. Income poverty levels are high and leave the population highly impoverished. About 38% of the population was unemployed in 2011 and about 73% of households having income less than R3200 per month. In addition, 18% had no source of income (Census, 2011). Results from Census 2011 and other research findings show that average household income in Khayelitsha was R1600 by 2011 (Seekings, 2013; Western Cape Government, 2013). This has caused increased dependence on governments social assistance programme either in the form of Child Support Grant (CSG) or Foster Care Grant (FCG). The CSG is a huge social assistance strategy in South Africa

Supporting over 12million children and constitute 63% of children in the nation in 2018 (Patel et al., 2019b, 2019a). The CSG currently supports about 13million children in South Africa (DSD 2019). The CSG previously stood at about R350 per child per month, Foster Care Grant (FCG) was up to 890 in some case, Old Age grant(OAG) and Disability Grants(DG) were both R1500 per month (Hall, 2013; Kelly, 2016; Seekings, 2013). However, these amounts have increased over time especially the CSG which now stands at R410 (DSD, 2019).

Khayelitsha's economic activity relies on informal trading. However, several businesses are also hosted in the busy and formal and informal settlements areas. The main shopping centres are located in Site C Plaza, Site B Shopping Centre, and the Khayelitsha Shopping Centre. The of the business environment be it the informal or formal sector, there is clear evidence of diversity in the markets. The area is the fifth-largest contributor to GDP of Cape Town (Dinbabo et al., 2017; Treasury, 2012).

2.2.5 Mitchells Plain

The creation and history of Mitchells Plain is not too different from that of Khayelitsha discussed above. The establishment of The Group Areas Act of 1950, legalised the use of force to remove and relocate to a fixed area based on their race and financial status (Platzky and Walker, 1985). Mitchells Plain is one of the remnants of the apartheid government's racial segregation in South Africa. It was created in the 1970s when Coloured people and their families were forcibly removed from their lands and relocated to the present site. This peripheral township is characterized by several social disintegrations with the family and the communities at large. It is reminiscent of poverty, inequality and destitution. Family disruptions, gang violence, drug addiction, unemployment are the mainstay of Mitchells Plain (Haefele, 2011; Yu and Nieftagodien, 2007).

2.2.6 Location and settlement history:

Mitchells Plain is located about 20km from Cape Town's city centre. Mitchells Plain was designed to separate and keep people of Colour far from the rest of the City. According to the City of Cape

Town (2011) Mitchells Plain's residents were kept from the Northern and Southern Suburbs predominantly White neighbourhoods. Its boundary to the west is Philippi. The area is situated west from the Philippi- another Black African suburb, and south from the False Bay coastline. The East of Mitchells Plain is Khayelitsha, which are both separated by the Swartklip Road. From the North Mitchells Plain, the boundary is the R300 highway and part of Philippi (City of Cape Town, 2011). Mitchells Plain lies in the wider belt of the Cape Flats and is currently home to the Coloured population in Cape Town

The Group Areas Act of 1950, created system segregation and discrimination in South Africa. Platzky and Walker (1985) state that individuals were forced to relocate to the fixed area. This gave the apartheid government greater access and control of the people and enforced their racial discrimination against blacks and people of colour against their human rights and dignity(Dubow, 1989; Maylam, 2017; Van den Berghe, 1966).

The apartheid government promoted and maintain a system that ensured division, by developing group areas 'townships' to maintain control and security desired by the government(Maylam, 2017; Turok, 2001). In doing so, communities emerged with a strong racial divide. It is therefore surprising to see that drawing a random sample of 4000 people as in the case of this study over 95% Coloured in the case of Mitchells Plain and Black Africans in the case of Khayelitsha. The new townships areas consisted of individuals of the same racial group. The creation of Mitchells Plain created a system of dependence on the government for social assistance. The population had been moved from their sources of livelihood. The new residential areas developed with negative socioeconomic conditions that aggravated into poverty and a high unemployment rate which resulted in little growth within the community(Turok, 2001). Each area had been designed to purposely isolate its residents from other racial groups. Mitchells Plain is a legacy of the apartheid era Group Areas Act of 1950 and it is viewed as a stereotypical showpiece for the goals and

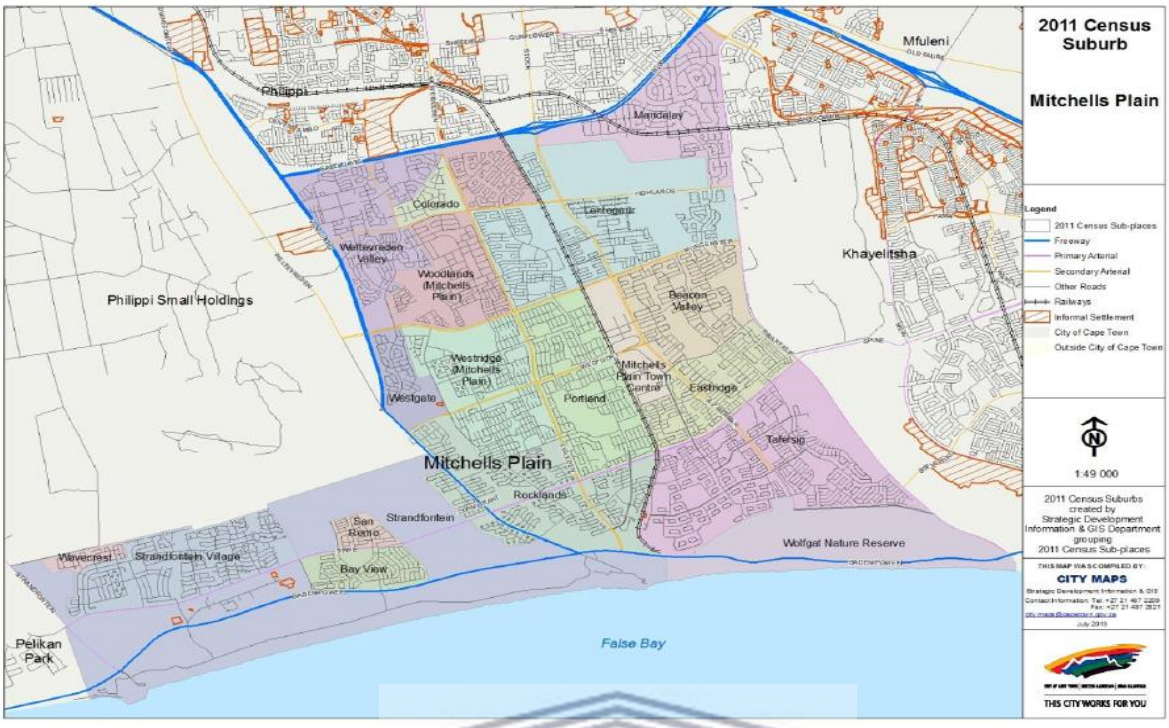
restrictive measures put in place by the National Party. It resulted in a class-bound, dormitory community for Coloureds (NA, 2015).

2.2.7 Physical and administrative structures

The map of Mitchells Plain below shows the geographical location and boundaries of the township. It is divided into 19 Sub Places according to Census 2011(StatsSA, 2012). Mitchells Plain is large and has three sub-councils. A sub-council is defined as a geographical area within the city that is comprised of between three and six neighbouring wards(City of Cape Town, 2013). Subcouncils are smaller units of administration that has very close proximity to the people of the area. There are a total of 24 Subcouncils which make up the City of Cape Town's municipal structure. A sub-council be made up of more than a few wards.

- Sub-council 12 is characterised by 9 sub-areas, namely, Mitchells Plain Town Centre, Westgate, Rocklands, Tafelsig, Eastridge, Westridge, Portlands, Beacon Valley and Wolfgat Nature Reserve.
- Sub-council 23 is characterised by 5 sub-areas which include Woodlands, Weltevreden Valley, Colorado, Mandalay and Lentegeur.
- Sub-council 19 is characterised by 5 sub-areas which include Strandfontein, Strandfontein Village, San Remo, Bay View and Wavecrest (City of Cape Town, 2012).

Figure 2-2: Map of Mitchells Plain



Source: Census, 2011.

2.2.8 Housing characteristics

During apartheid, access to land and ownership was determined by race and economic status. Because of its policy of segregation and discrimination, the minority White population owned and had access to a vast territory of land while the majority of people bound to their homelands or township located in urban peripheries. The segregation of non-white South Africans meant let to overcrowding of black and coloured townships proliferated with mushroom backyard dwellings. The political reforms of 1983 did not help transform the township areas but rather led to increasing social protest for lack of social services in the townships. The spatial segregations enforced several oppressive legislations including the Natives Land Act27 of 1913, Group Areas Act 41 of 1950, and the Prevention of Illegal Squatting Act 52 of 1951. Implementing these policies was an outright legal instrument to persuasively deny people their basic human right.

The Constitution of South Africa states in its Section 26 the right to adequate housing:

"1) Everyone has a right to have access to adequate housing.

2) The state must take reasonable legislative and other measures within its available resources to achieve the progressive realisation of this right.

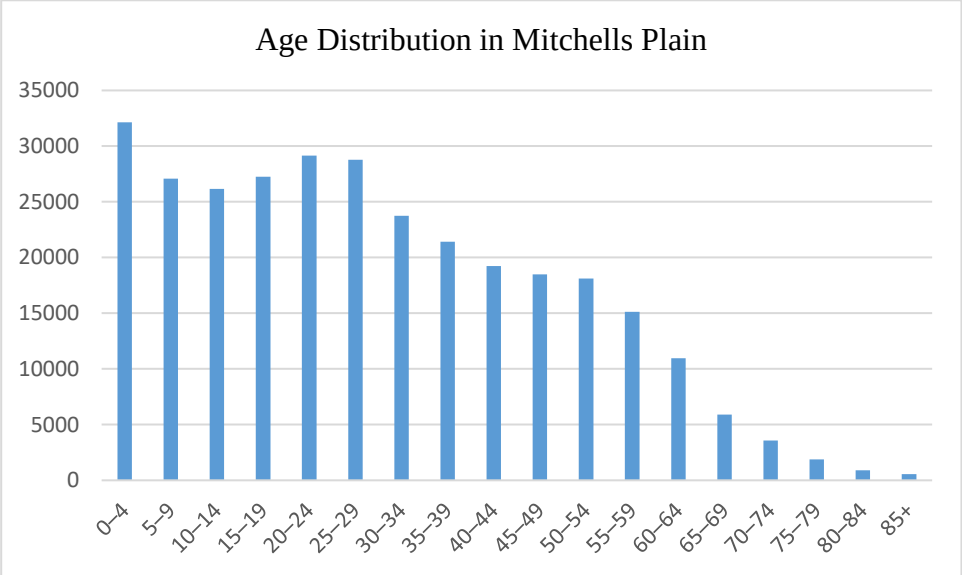
3) No one may be evicted from their home or have their home demolished without an order of court made after considering all the relevant circumstances. No legislation may permit arbitrary evictions" (Constitution of the Republic of South Africa, 1996)

Department of Human Settlements reports that 4.3 million houses and housing opportunities have been delivered since 1994. In the 2014 General Household Survey, results show that about 15.3% of South African households live in RDP houses. In Mitchells Plain, 94.9% of residents live formal dwelling and 3.6% live in informal dwelling types such as shacks and backyard Wendy houses (StatsSA, 2014). While much improvement has been done since post-apartheid era, housing remains a major challenge for the residence of these areas.

2.2.9 Mitchells Plain population profile

The population of Mitchells Plain is predominantly Coloured, speaking Afrikaans and English languages. Given its surface area of about 43.76km^2 and a density of 7100/km^2(StatsSA, 2011) According to StasSA (2011) report, there were about 310 485 people living in Mitchells Plain in 2011, Whereas, in 2001, census results showed that Mitchells Plain population was 398 653. This is a significant drop in the population. Similar to Khayelitsha, population figures for Mitchells Plain are inconsistent. A study carried out by The Unit for Religion and Development Research, the University of Stellenbosch in partnership with Transformation Africa Population shows that Mitchells Plain population in 1996 was 251,121 and in 2001 the population grew to 283,185, an increase of 32,064 in six years period. The Western Cape Government (2013) reported that the population of Mitchells Plain was 398,653 indicating that the population has rather decreased since 2001. It is not clear why Statistics South Africa's population figures drop in the 2011 census after about 10years. The implication of changing population figures could have serious adverse effects on public service strategic planning and service delivery.

Figure 2-3 Age distribution



Source: Author's analysis of census data taken from Frith, A. (2011)

Age is a key determinant of population health. In figure 2.3 above, the histogram shows that the population of Mitchells Palin significantly youth population. Children below 15years account for 27% of the population, while those within the working-age 15-64 make up 68% of the population. The population above 64years was just about 4%. This explains part of the reasons for the high unemployment rate. There is a large population of working age but who cannot find a job. However, reports from StatSA (2011) states that half of the population, that is, 50.2% (155 853), consists of individuals between the ages of 25-64 years (Census, 2011). The youngest group within this population makes up 10.4% (32 148). Though this study looks at overweight and obesity in adults and children, the main age group of interest was 5-11 years old. This group falls within the census category of 5-14 years old and makes up about 17.1% (53 248) of the population of Mitchells Plain in 2011. All adults 18 and above were included in the study and were eligible for BMI measurements.

Mitchells Plain is more female populated than males. Females consist of 51.4% (159 452) and males constitute 48.6% (151 032), as seen in the table above. According to the 2001 Census, females constituted 51.7% and males made up 48.3%. This shows that the gender distribution in Mitchells Plain has, over time, been relatively stable.

There were 67 995 households in Mitchells Plain in 2011 with an average household size of 4.57 persons. Statistic South Africa defines a household according to the number of the person(s) living together, sharing food, and other amenities (Census, 2011). Of the 67995 households, about 37% are female-headed households.

It is already stated in this chapter that the population of Mitchells Plain population is predominantly Coloured people. Table 2.4 below shows that Coloured people account for 91% (281 828) of the population, while Black Africans make the second largest group with 7.3% (22 732) (Census, 2011). The other groups, namely Asian, white and other are relatively small in comparison to the Coloured community, consisting of 0.6% (1926), 0.2% (580), and 1.1% (3427) respectively (Census, 2011).

Table 2-3 Population by race

Mitchells Plain population by race						
	Black African	**Coloured**	**Asian**	**White**	**Other**	**Total**
Number	22 723	281 828	1926	580	3427	310 484
Percentage (%)	7.3	90.8	0.6	0.2	1.1	100

Source: Census, 2011.

2.2.10 Public services provision and facilities

Accessibility to clean water is an essential factor in maintaining a healthy lifestyle. According to the Western Cape Provincial Treasury (2013), water supplied or made available to residents of the communities should be regarded as safe, to reduce the spread of illnesses within a community.

Most of the residents in Mitchells Plain have access to water inside their homes (95.9 %), while 0.7% of residents do not have access to water. Residents who have access to piped water inside their yards make up 2.7%, whereas those with water outside their yards account for 0.7% (Census, 2011).

The use of energy is a crucial component as it is needed in individuals' everyday lives; energy is frequently used for cooking, heating, and lighting purposes. There are multiple sources of energy; these include, natural and man-made. However, the uses of these different energy sources present risks that relate to individuals' health and safety (Western Cape Provincial Treasury, 2013). Electricity is recorded for three main functions in the Census 2011 report, namely lighting, cooking, and heating. The majority of the residents use electricity for those three functions.

Sanitation is important to ensure the good health of individuals by making sure that human waste is disposed of appropriately and safely. It is important, therefore, that access to working toilets is provided to citizens. The failure of providing workable sanitation systems can lead to health illnesses which may be serious (Western Cape Provincial Treasury, 2013).

Table 3 below depicts the types of sanitation systems available in Mitchells Plain. It shows that most of the population's toilets are connected to a sewerage pipe and can dispose of their waste using a flush mechanism whereas others do not have access to human waste disposal.

Table 2-4: Sanitation

Mitchells Plain's Sanitation

Type of Sanitation	Number	Percentage (%)
Flush with connection to a sewerage pipe	64929	95.5
Flush with connection to a septic tank	462	0.7
Bucket toilet	966	1.4
None	999	1.5

Source: Census, 2011.

Refuse removal, like sanitation, is important for health-related issues of inhabitants. Moreover, removing waste allows the environment in which citizens live to be clean thereby ensuring the safety of their health. When waste is not removed regularly, it may lead to dumping (Western Cape

Provincial Treasury, 2013). Most of the residents in Mitchells Plain have garbage collected by the City of Cape Town Council (99.5%).

Mitchells Plain is home to a few health institutions, it hosts 8 clinics which can be located in its different sub-areas. Aside from its clinics, it has two general hospitals and one psychiatric hospital. Mellomed Hospital Mitchells Plain has an oral health centre which is a dental healthcare organisation run by the University of the Western Cape Dental Faculty. In addition to Melomed Hospital and Mitchells Plan District Hospital, it has a Midwife Obstetric Unit (MOU). In addition to its hospitals, the area is home to 25 dental practices, 5 physiotherapist practices, 10 psychologist practices, and has an established rehabilitation facilitation centre (Mitchells Plain Local Directory, 2016).

There are numerous educational institutions in Mitchells Plain for school-goers. There are 74 schools within the 9 areas of Mitchells Plain. Primary schools make up the majority of the educational institutions which account for 43 schools, followed by 17 secondary schools, 6 pre-primary schools, and 4 LSEN (Learners from special education needs school) institutions. There is a single TVET institution in Mitchells Plain called False Bay College (Mitchells Plain Local Directory, 2016).

The City of Cape Town set up a recreation centre in District 3, called the Mitchells Plain Family and Youth Centre (CoCT, 2014). This district includes Mitchells Plain, Colorado, Tafelsig, Khayelitsha, among others. The centre boasts facilities like the main hall, smaller hall, courtyards, basketball court as well as a computer room (CoCT, 2014). A study, which ultimately resulted in the creation of this centre, indicated that inhabitants of this district are active. It showed that the residents, during their free time, are involved in physical activities. Specifically, it indicated that 37.8% of the residents engage in physical exercise often, whilst 32.8% are involved in sports and other recreational activities (CoCT, 2014). Most of the children are engaged in physical activities when they feel bored and 70.7% are involved in sport and recreational activities, while another

63% often engage in physical activities (CoCT, 2014). Additionally, there are many other sporting activities and clubs in Mitchells Plain which are available for the residents, which include: boxing, chess, cricket, cycling, darts, gymnastics, karate, rugby, running, soccer and tennis (Mitchells Plain Local Directory, 2016). Moreover, there are 11 sports complexes or fields within Mitchells Plain. This shows that the community of Mitchells Plain has many physical and recreational centers and clubs within which to participate.

There are 17 community organizations in Mitchells Plain, according to a local directory. Most of the activities of the organizations are aimed at the development of the community itself, with regards to family counselling as well as drug counselling, shelters, and educational development. They include Autism Connect, Beacon valley Community Frail Care Centre, Cape Town Drug Counselling Centre-Mitchells Plain, Colleen's Place of Hope, FAMSA-Mitchells Plain, Heaven's Shelter House, International Foundation for Education and Development SA, Jireh Community Projects, Khulisa Social Solutions MP, Mitchells Plain Islamic Society, Mitchells Plain Network Opposing Abuse, Mitchells Plain Skills Centre, Nicro-Mitchells Plain, Read to rising, Rocklands Youth Café, Thembani Haven of Care Organisation Network and Youth Unemployment Prevention Project (Mitchells Plain Local Directory, 2016).

2.2.11 4.1.6. The socio-economic structure of the population

The income distribution of the residents of Mitchells Plain is spread between receiving no income and earning more than R102 401 monthly. These statistics are based on those who are eligible to enter the labour force, who are those between the ages of 15 to 64 years of age (Census, 2011). A total of 70% of the Mitchells Plain population earn between R1 601-R2 560, with equal proportions of 20% each allocated to the earning brackets of R3 201- R6 400 and R6 400-R12 800 respectively; 10.4% of the population is recorded as households with no income. These would most probably account for households that do not have fixed or regular incomes. It can only be

assumed that this figure would be related to informal market activity as well as those households who are possibly surviving on grants (Census, 2011).

Regarding the academic achievements of the adults in Mitchells Plain, 48.7% of adults achieved some secondary education, 28.6% completed their matric, while 1.1% had no schooling. Those who achieved a tertiary education account for 5.9% of the population. Based on the statistics, it shows that more than half of the population obtained a secondary education.

The labour force in Mitchells Plain who is able to work makes up 212 250 of the residents. From this group, only 46% (129 363) has been confirmed as employed, leaving the remaining proportionately unemployed figure at 24% (31 218) for this area (Census, 2011). The distribution according to economic sectors shows that there are three main segments that describe the division of labour in Mitchells Plain. They include the manufacturing sector which accounts for 26% of the employed population, whilst retail and wholesale trade make up 21.8% and community social and personal services account for 20.5% (Census 2001; Statistics South Africa, 2003).

The highest group is composed of sales, services, and clerical workers who account for 29.7%. The second-largest occupational sector comprises unskilled labour which makes up 19.8%. Trade workers make up 17.8% while professional and semi-skilled workers account for 28.6%. Managerial positions account for the smallest number of workers, at 4.1% (Census, 2001; Statistics South Africa, 2003).

The commercial activity in Mitchells Plain is closely connected to Khayelitsha to the extent that their economies are linked (Wolfgang, 2005). Due to their large population numbers, the two locations have a high purchasing power and have managed to create a high commercial site as well as smaller commercial sites (Wolfgang, 2005). Mitchells Plain has the most developed commercial site in the central business district. The informal business sector incorporates a retail plaza (a small shopping centre) at the train station which includes major transport interchanges. Some of the

challenges faced within the commercial activity in Mitchells Plain which contribute to the decline of formal business are the high gang activity as well as the lack of control over the informal trade sector in Mitchells Plain (Wolfgang, 2005; Murcott, 2012). Another challenge is that the residents shop outside of Mitchells Plain in the competing areas like Bellville, Cape Town, and Claremont. The informal sector is experiencing restrictions in this area, and one way to combat this is to formalize their enterprises (Wolfgang, 2005).

Chapter 3
LITERATURE REVIEW

3.1 Introduction

This chapter is structured to provide a broad overview of food choices and BMI. Reviewed a wide range of literature on the subject from a global perspective to the South African context. This broad review was necessary to situate the study within an appropriate framework.

Obesity worldwide has reached a crisis stage (Ng 2014). Several studies have been carried out which point to the risk of increasing Body Mass Index (BMI) and BMI related diseases. Women and children are most susceptible to obesity due to the effects of poverty, inequality malnutrition (Puoane et al., 2002; Kruger et al., 2005; DOH et al., 2007; Kim, 2008; de Onis et al., 2010; Kengne et al., 2013; Martorell et al., 2000; Ziraba et al., 2009). Researchers, civil society, and international organizations such as the Food and Agricultural Organisation (FAO), the World Health Organisation (WHO); Governments, and Stakeholders have contributed substantially in highlighting some of the problems of weight gain locally and internationally.

Nammi et al. (2004) describe obesity as a multi-factorial disorder that is associated with several health risk indicators such as diabetes, hypertension, and certain cancers. In addition, overweight and obesity are associated with socioeconomic factors, cultural dynamics, lifestyle, and environmental factors. Due to the complexities associated with overweight and obesity, viewing obesity from a multidisciplinary perspective- nutritionists, health practitioners, sociologists, agriculturists, anthropologists, economists, physiologists, and geographers, provides a better understanding of overweight and obesity, consumption behaviours, and associated risk factors (Contento et al., 2006; Devine et al., 2003; Morton et al., 2006). These social-ecological characteristics of overweight and obesity make treatment and prevention complex.

In addition, the complexities of the human body weight gain are further exacerbated by rural-urban migration, leading to a change in lifestyle towards a more sedentary way of life caused poverty and inequality. Moreso, urban special planning and distribution and food tend to the increase cost of living. Khayelitsha Malhotra et al. (2008) high prevalence of obesity in women in urban areas in South Africa. The study noted the lack of physical exercise and poor nutrition as a key driving factor. Turok and Borel-aladin (2014) explored the link between urbanization and living conditions in South Africa in ten years. The study found that despite urbanization creating opportunities for employment the provision of houses to accommodate the growing city population has not kept pace with the growing urban population leading to an increase of shack dwelling which impacts food access, hygiene, and sanitation, vulnerability to poor health.

This review focuses on global trends in obesity, global trends in child obesity, poverty and inequality in South Africa and its association to food choices, food access, and overweight and obesity, nutritional status and finally show that the absence of a legislative framework to address the problem is radically absent in the obesity discuss in South Africa.

Furthermore, the review highlights the scarcity of research on children's access to food and how the policy of the Best Interest of the Child (BIC) has not been sufficiently implemented in South Africa to mitigate the problem of weight gain in children. Likewise, the study shows that despite various multidisciplinary approaches to the problem of overweight and obesity, the concept has not been sufficiently studied in South Africa concerning children's socio-economic rights.

3.2 Food security perspectives

3.2.1 Global Food Security

There is evidence that a relationship exists between overweight, and obesity on the one hand and food security/insecurity, food access, poverty, inequality (Adams et al., 2003a; Dhurandhar, 2016; Eisenmann et al., 2011; Mohammad et al., 2016; Ryan-Ibarra et al., 2017). Food Security is studied

from different dimensions (Adams et al., 2003 ; Dhurandhar, 2016 ; Eisenmann et al., 2011 ; Mohammad et al., 2016; Ryan-Ibarra et al., 2017). The literature on food security suggests that the concept is multidisciplinary. It spans into social, economic, political, and cultural related perspectives. In addition, it is measured both at macro and micro levels (Maxwell et al., 1992; Story et al., 2008; Timmer, 2005). These broad perspectives of food security discuses certain key concepts in terms of definition, policy, theory, and the measurements of food security. This section begins by providing a synoptic review of the history and development of the concepts. That is, where it started, how it has evolved, and where it is, after the 2015 targets of the Millennium Development Goal.

The food security debate has been ongoing for several decades. Over these years, different intuitions and governments have made great strides in conceptualizing and theorizing food security issues to try to find common workable solutions to problems of food insecurity as well as its association to poverty, health, nutrition, malnutrition, overweight, and obesity, which are all corollaries of the broad food security problems. Shaw (2007) developed a historical perspective of world food security since 1945.

The first international attempt to recognize and address the problem of food security was at the International Conference in 1943 to form the United Nations Food and Agricultural Organisation (FAO). Food security was conceptualized then as freedom from want of food and form part of four fundamental human rights.[1] The conference which was strongly influenced by the technological development on nutrition and its relevance on human health and wellbeing had as "objective to defined as insuring 'an abundant supply of the right kinds of food for all mankind', hence the

[1] The United Nations Conference on Food and Agriculture, convened by President Franklin D. Roosevelt at Hot Springs, Virginia, USA in May/June 1943, during the Second World War, led to the creation of the Food and Agriculture Organization of the United Nations (FAO). In his State of the Union address on 6 January 1941, before the United States entered the war, President Roosevelt had identified 'four essential freedoms': freedom of speech; of worship; from want; and from fear – 'everywhere in the world' (Rosenman, 1950).

importance of dietary standards as a guide for agricultural and economic policies concerned with improving the diet and health of the world's population" (Shaw, 2007, p. 24).

It is intriguing to note that after the ambitious speeches of United States President Franklin D. Roosevelt and the FAO then newly elected director, Sir John Boyd Orr, in the 1943 Conference, one would have expected the food problems of the world to decrease substantially. Yet, food security seems to live with humanity and an increasing loss of hope for the poor for their want of food. "There has never been enough food in the world since before the Second World War", (Boyd-Orr, 1943; FAO, 1946) a statement that has been proven to the contrary since technological advancement has increased world food production substantially. The paradox, however, is that increase in food production does not automatically translate to food access to all.

In early 1945, the world was addressing food problems based on two factors; first, the Second World War had caused shortages of food around the world which needed to be addressed. Secondly, hunger and malnutrition were top on the agenda of the FAO targets and were scientifically construed as critical for health and wellbeing. At the Quebec conference of 1945, members agreed to:

> raising levels of nutrition and standards of living of the peoples under their respective jurisdictions; securing improvements in the efficiency of the production and distribution of all food and agricultural products; bettering the condition of rural populations; and thus contributing toward an expanding world economy [and ensuring freedom from hunger and malnutrition](Shaw, 2007, p. 9).

Since the main issue in the 1974 Conference was the availability of food at all times, sufficient to feed the world sustainably, by 1983, the FAO realized the need for economic and physical access to food (FAO, 1983). Further development of the concept was established after the World Bank

Report of 1986 on Poverty and hunger (World Bank, 1986). According to the report, a clear distinction had to be made between chronic food insecurity and its association to poverty, income inequality or low-income levels, structural poverty on the one hand, and transitory food insecurity caused by a natural disaster, conflicts and economic stagnations or economic collapses (FAO, 2006). Additionally, even with the most popular food security definition below, Dilley and Boudreau (2001) arrive at a similar conclusion when they looked at food security and vulnerability and hazardous risk factors, especially for programs design and interventions.

There is a widely acceptable FAO definition which includes the availability and access to nutritious food at all times. *"Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life"* (World Food Summit, 1996, p.1). Inversely, food insecurity exists when the above is to the contrary. Pinstrup-Andersen et al. (2001) argue that despite the relevance of the FAO definition and its usefulness in measuring food security, the inclusion of nutritional security should as well be combined with hygiene and sanitation at household levels. Whereas Dilley and Boudreau (2001) argue that albeit the objective of targeting the vulnerable population, in the context of food security, vulnerability assessment should be more prudent in identifying the exogenous factors associated with food insecurity and its outcomes such as famine, hunger, and malnutrition. Other studies have shown that current food security definition is limited first in terms of production and secondly on economic access (Amir, 2013; Dilley and Boudreau, 2001).

Food and population scepticisms have also closely followed food crises and vis-versa. Reference is made to the Malthusian pessimism of 1789, Sir William Crookes's of 1890, the food crises caused by the first and second world wars of 1919 and 1945 (Shaw, 2007), as well as the most recent food crises of 2008. According to (Timmer, 2010) the food crises of our generation (1972/73 and in 2007/08) provides lessons on how policies on food production and distribution

ought to be managed. Food crisis to larger extents focused on production and distribution especially when it comes to the shortage of food in the developed world. Neoliberal thinking seems to suggest that most of the world's poor people have lived and continue to live under crisis conditions for decades not having enough food and nutrients and the only possible solution is you can only buy what to eat (Amir, 2013; Guthman, 2008a, 2008b).

Evidence from the 1945 International Food Survey showed that measurement of the amount of calorie intake per individual did not include most of the then less developed countries. Yet a generalization was established on the world's calorie intake. Setting a benchmark in the context of the developed countries leaves a huge gap in the measurement of what is considered a food crisis only from a developed country perspective. A proper approach to contextualizing food crises is needed especially nutritional crises. This study builds on the localization of food access and food security issues in the context of South Africa where inequality is pervasive.

Generally, however, most of the food security discusses are multidimensional, and therefore fixing one does not fit all. Food security spans into agriculture, poverty, and health, nutrition, and malnutrition, regional and international trade, which are all very broad concepts. Its social dimensions relate to behavioural and other psychosocial related issues such as perceptions. These issues have been discussed both from international to local levels (Godfray et al., 2010; Maxwell, 1996; McMichael, 2009; Pinstrup-Andersen et al., 2001). This research does not attempt to look at the entire scope of food security but has focused on a micro-level food security issue that is, as it relates to access to food and micronutrients in association with current overweight and obesity trends in south Africa.

In the year 2000, the United Nations came up with the Millennium Development Goals (MDG). The MDG's aim to reduce the proportion of people living in poverty and hunger by half and reduce by two thirds the mortality of children under five year of age. According to FAO (2013) from 2011

to 2013, 842 million people in the world suffered from chronic hunger. According to the report, one in eight persons in the world is not getting enough food sufficient to conduct an active life.

In 2015, South Africa succeeded to meet its MDG target of reducing the proportion of people who suffer from hunger. From a target of 15%, the country achieved a 12% reduction of hunger while undernutrition drop to less than 5% (Statistics South Africa, 2015, p. 43). However, from the World Food Summit perspective (whose goal is to eradicate hunger in all countries by substantially reducing the number of people who are undernourished by half their present level by 2015. South Africa is yet to meet that target. According to the FAO

> "About 795 million people are undernourished globally, down 167 million over the last decade, and 216 million less than in 1990–92. The decline is more pronounced in developing regions, despite significant population growth. In recent years, progress has been hindered by slower and less inclusive economic growth as well as political instability in some developing regions, such as Central Africa and Western Asia"(FAO and IFAD, 2015, p. 1).

Food security and nutritional security are critical components in ascertaining how a person or people can live healthily. Even though these are two parallel concepts, their point of convergence turns to relate to underweight, overweight, and obesity which are not mutually exclusive.

According (Gundersen et al., 2009) studies on the association of food insecurity and overweight and obesity have produced mixed results. Though some studies have found evidence that correlates food insecurity and an increase in body weight (Casey et al., 2006; Dubois et al., 2006). Other studies have shown a strong association of these concepts(Adams et al., 2003b; Casey et al., 2006). However, finding showing that food insecurity is not associated with obesity should not be conclusive especially amongst children (Gundersen et al., 2009). Different researchers have applied different methods and strategies to draw inferences on the association of food security and

obesity. In the context of this study, we assess the association of food choices and BMI in association with other socioeconomic factors to understand the nature of food security in the study areas and the underlying factors driving overweight and obesity.

3.2.2 Food and Nutrition Security in South Africa

South Africa is an emerging economy that is food secure at the country level. According to (Müller, 2018, p. 1) "The strength of the [agricultural] industry was particularly visible through the country's 2017 agricultural exports, which exceeded $10-billion for the first time in the country's history''. The country is one of Africa's net exporter of agricultural commodities, thanks to its mechanised large-scale farming. Despite these increases in food production, the country continues to experience food insecurity such as malnutrition, stunting amongst children, overweight, and obesity over time (John-Langba, 2015). These pieces of evidence malnutrition, stunting, overweight, and obesity which are some of the key indicators used for measuring food and nutritional security (Shisana et al., 2014; Symington et al., 2016).

Obesity has increased to more than 50% and women are most susceptible. Over 25%b of children under the age of 5 are classified as stunted and the majority of black South Africans bear the burden of food insecurity (Statistics South Africa 2017; Aliber 2015; May & Timaeus 2015). A similar finding was also raised by researchers especially after the 2008 global recession (Altman et al., 2009; Jacobs, 2009) These pieces of evidence show the prevalence of malnutrition, stunting, overweight and obesity which are some of the key indicators used for measuring food and nutritional security (Shisana et al., 2014; Symington et al., 2016).

One of the many factors associated with food insecurity is that many South Africans remain landless, especially Black South Africans who were disadvantaged from participating in the economy during the apartheid era (Berry, 2002, 2002; Delport, 2019). Current government policies are changing rapidly to ensure inclusive participation in the economy through access to land for the Black majority (Fukuda-Parr and Taylor, 2015; Mbajiorgu, 2019; Pereira and Drimie, 2016).

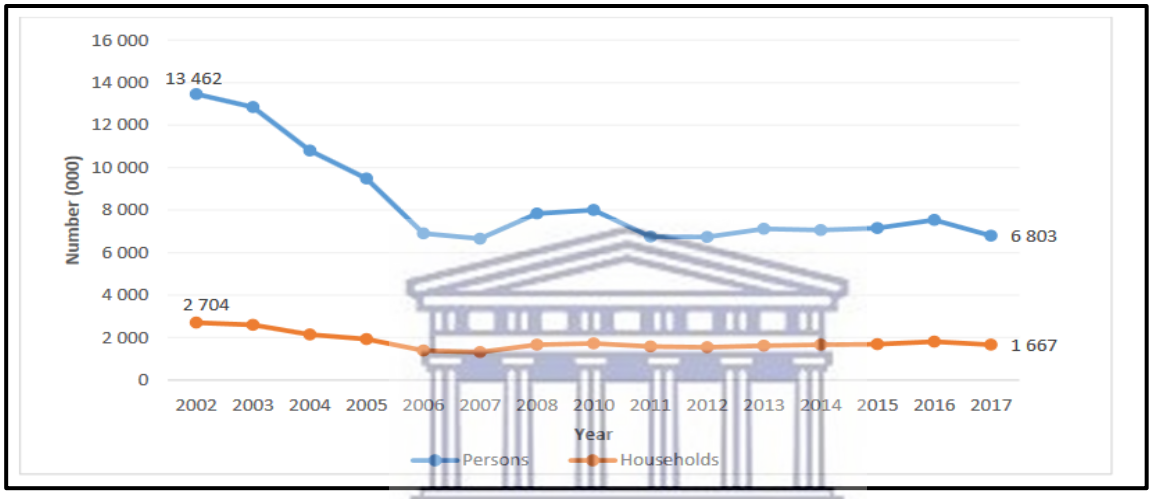
South Africa's food security problems do not arise from the absence of basic food and nutrition but from the lack of access and affordability caused by gross inequality and poverty in poor households(Atman et al., 2009; Labadarios et al., 2011a; Rose and Charlton, 2002a; Wenhold and Faber, 2008). In this review, three elements of social reality associated with food insecurity in South Africa: poverty, inequality, and unemployment are identified. It is important to review these three pillars of food insecurity in a bid to understand the interactions of these trinities of death in South Africa and its implication on poor households. The association of poverty, inequality, and unemployment remain one of the biggest social and economic challenges faced by the South African population.

Since 1994, despite several attempts by the government to reduce the level of poverty, inequality, and unemployment, the three pillars of death- poverty, inequality, and unemployment [my emphases], have remained pervasive. The majority of Black South Africans continue to struggle to meet their basic household food needs (Labadarios, 2009), partly because of an increase in food prices, interest rates, energy tariffs. According to Altman et al. (2009) increase in employment will play a significant role in addressing food insecurity problems. But the challenge of reducing unemployment in South Africa is almost becoming an impossibility as the unemployment statistics continue to soar. Statistics South Africa's (2019a) economic outlook in the Fourth Quarter of 2019 showed that unemployment increases by 29% and according to Mwangi, (2020) for the first time since 23008, unemployment figures remained unchanged. (Oosthuizen, 2020). According to increasing income security through employment as expanding current social assistance schemes will greatly mitigate the impact of food insecurity on the vulnerable (Altman et al., 2009).

Structural poverty in South Africa's household is a major cause of food and nutrition insecurity at the household level (Human Science Research Council, HSRC, 2007). Food insecurity in South Africa is highly associated with people's socioeconomic wellbeing. Given the state of poverty and inequality in South Africa, many South Africans are yet to escape from the clutches of

intergenerational poverty (Bird, 2013). Household food insecurity in South Africa is structural and caused by widespread chronic poverty and unemployment. states that food insecurity in South Africa is characteristic of household food insecurity. Given the current dynamics in the growth trajectory of the economy, proposing a model that depends on economic growth can only increase the burden of hunger and malnutrition in South Africa. There is a need for a coordinated approach to poverty alleviation that involves all sectors of the State.

Figure 3-1 Households with persons vulnerable to hunger



Source: StatsSA (2019, p.1)

Table 2.1 shows that in the period 2002 to 2017, more than 6million South Africa experienced some form of hunger both at the household level and at an individual level, down from 13million in 2002 (Statistics South Africa, 2019b). Despite this remarkable progress in food production, it remains unclear why many South Africans are still trapped in food poverty (Atman et al., 2009). Household food security remains a major challenge and its implication on the health of poor households living in urban townships in South Africa and Khayelitsha and Mitchells Plain, in particular, is still to be fully assessed.

Section 27 of the Constitution of South Africa provides for the right to adequate food and nutrition at all times (Constitution of South Africa, 1996). However, studies continue to show that despite

South Africa being a net exporter of agricultural commodities, one is made to believe that the country is sufficient food secure (Babu et al., 2014; De Cock et al., 2013; Labadarios et al., 2005). In 2004, the Human Science Research Council (HSRC) estimated that 14% of the South African population was more likely to be food insecure, while 25% of children below 6years were found to be stunted (HSRC, 2004). Given this backdrop, several studies have cast doubt as to whether the current system is sufficiently enforceable to address the back lock of food insecurity created by the country's historical experience.

Evidence from the first South African National Health and Nutrition Examination Survey (SANHANES-1), reveal that at the time of the survey just about 45.6% of the population was food secure (Pereira and Drimie, 2016).

> Hunger was prevalent in 26.0% of the population. The largest percentage of participants who experienced hunger was located in rural formal (37.0%) and urban informal (32.4%) localities, reflecting both a rural and urban dimension. Demographically, the Black African race group had the highest prevalence of food insecurity (30.3%), followed by the Colored population (13.1%), and then the Indian/Asian population (8.6%). Of those at risk to hunger, the Black race group again had the highest risk at 30.3%, followed by the Indian population (28.5%), the Coloured population (25.1%), and then the White population (9.4%) (Pereira and Drimie, 2016, p. 4).

These pieces of evidence call for an urgent and coordinated approach to the food insecurity problems in South Africa. It is in the context of its complexities that May, (2017) describe it as complex wickedness. Food security problems worldwide and in South Africa in particular are incoherent, indeterminate, and unclassified. There are bits and pieces of legislation, rules, and regulations administered by several government departments such as the Department of Agriculture, Social Development, Health and Trade, and Industry. This complex terrene of the

food industry has created a complex web making it difficult for the poor to access food are affordable prices within their limited resources.

In addition, despite the human right approach to food security for all, enforcement of those rights poses economic challenges for the government (Hendriks, 2014; May 2017). One of the key messages for this research is to state upfront, the need for a well-structured legislative framework that will be enforceable at level regardless of its economic and political implications to ensure that poor South Africans have access to food at all times in the right quantity and quality.

The overall goal of food and nutrition security policies in South Africa is to "…achieve household food and nutrition security and support individuals in accessing adequate individual dietary intakes to meet their needs at different stages in the human life cycle"(Hendriks, 2014, p. 7). However, as demonstrated within this study, it is clear that South Africa's current food and nutrition-related policies are far from reaching these objectives.

3.2.3 South Africa's Food Security Policy Framework

The South Africa food policy framework is built on the international principles of human rights set out by the United Nations in 1948, the African Charter on Human and People's Rights, the 1996 Constitution of the Republic of South Africa, and other international bilateral and regional agreements as well as local legislation. Articles 25 of the Universal Declaration of Human Rights 1948 and the International Covenant on Economic, Social and Cultural Rights (ICESCR) 1966 clear spell out the right to food as a basic human right. Article 11(1), of ICESCR provides the bases for the right to food. It is the right to having adequate food at all times which culminate in an adequate standard of living. In addition, the right to food in South Africa is further enforced by the Bill of Rights enshrined in the South African Constitution of 1996. According to the Bill of Rights, the onus rest on the State to ensure that all persons regardless of their race, gender have access to sufficient food and nutrition. In chapter four of this study, the liability on the state is further examined.

The challenges by governments in respect of the UN Convention and national food policy implementation are enormous and in the context of South Africa, there is currently no such coordinated approach to enforce food policies (Hendriks, 2014). Since the Native Land Act of 1913 which provided a framework for food security in South Africa, neither the Act nor the preceding pieces of legislation policies were sufficiently coordinated to ensure food security. There is yet to be a formal enforcement mechanism in South Africa that is aimed at enforcing food policies (Boatemma et al., 2018; Delport, 2019; Hendriks et al., 2016). In this context, therefore, this research seeks to highlight the fact that given the already porous systems and lack of a clear legislative framework (Hendriks and Olivier, 2015) that addresses the problem of food access, hunger, malnutrition, overweight and obesity are likely to continue in their upward trend in South Africa.

Boatemma et al. (2018) undertook a review of South Africa's food policies from 2002-2017 and found that existing policies have aided the production of food, capacity building, and school feeding schemes for children in primary school. However, these attempts to implement food security programs such as the School Feeding Schemes, as well as social grants are not sufficient to eradicate current problems of food insecurity in South Africa. Food insecurity is still widespread in the country, especially at household levels. Policy gaps and the lack of coordinated approach to enhance access especially for formally disadvantaged groups are limited.

3.2.4 The Institution of the Integrated Food Security Strategy (IFSS)

The IFSS was established at the time when most households in rural areas were in dear need of food assistance. At the end of the apartheid era where many South Africans were living in destitution and high levels of poverty and inequality, the IFSS was one of the multidimensional policy frameworks that targeted rural households. According to (De Cock et al., 2013, p. 1). The vision of the IFSS was "to attain universal physical, social and economic access to sufficient, safe and nutritious food by all South Africans at all times to meet their dietary and food preferences for

an active and healthy life." This makes it incumbent on the State to bear the brunt of implementing and subsequently eradicating poverty in South Africa specially to ensure food security.

Moreover, the IFSS was part of government strategy in achieving the Millennium Development Goal by 2015 set out by the FAO. This worldwide strategy through the MDG sought to significantly reduce the scourge of food insecurity, hunger, and malnutrition by half at national levels for member countries (see chapter one for details). Two of the five pillars of the IFSS is related to (1) nutrition and food safety and (2) safety nets and food emergency. The IFSS was however not efficient as the policy framework was not sufficiently independent with a clear mandate and budget to ensure its implementation and productivity in the form of food security.

3.2.5 Food Access and Nutrition

Reports on South Africa's access to food showed that access to food for many poor households has improved. However, according to the South African Year Book (2017), this improved seemed to have stalled from the year 2011. The household food security access scale for South Africa showed that households with inadequate or severely inadequate food access decreased from 23% to 21% between 2010 and 2017 (South African Year Book, 2017). Despite the improvement in access to food, the majority of poor South Africans continue to suffer from the effects of malnourishment. According to the South African National Food Consumption Survey (NFCS) of 2000, the food types easily accessed by poor communities are severely lacking in basic micronutrients (Labadarios et al., 2005).

Malnutrition has largely been studied within the context of hunger and disease and how it contributes to infant mortality. According to WHO (1997), 54% (6.3 million) of mortality of under five-year-old children was associated with malnutrition. Not much attention is given to child malnutrition based on the overconsumption of high energy-dense food types.

Poverty, malnutrition, and disease are almost inseparable. It will take a strong socio-economic and socio-political changes to break the bond of this various cycle. According to (De Onis et al., 1997) malnutrition is the function of nutritional imbalance of protein, iodine, and vitamin A which trigger growth imbalance, especially amongst children. It is the imbalance of the supply of protein-energy and body demand. Several studies have established that malnutrition leads to two outcomes: wasting, stunting, and underweight on the one hand, and overweight and obesity on the other (Romieu et al., 2017; Royo-Bordonada, 2016; Shisana et al., 2014a; Symington et al., 2016).

Global nutritional status is falling rapidly and South Africa is not immune to global trends. The (De Onis et al., 1997) report paints a very bleak picture of the current world nutritional status. There exit international and national evidence that shows that nutrition and diet play a critical role in children and affect the overall quality of life towards adulthood. A study of the relationship between malnutrition-underweight and stunting carried out in Jamaica indicates that childhood stunting was highly associated with a reduction in adult size.

Changes in the global food system and increased energy supply are considered to be among the major drivers of the obesity pandemic in the form of affordable and available obesogenic, ultra-processed foods (Vandevijvere et al., 2015). For Swinburn et al. (2011), the "overconsumption of energy leading to obesity is a predictable outcome of market economies predicated on consumption-based growth". Stronger economic forces, together with cheaper high-density foodstuff made possible by new technological changes are resulting in overconsumption and increasing obesity.

Another key global driver of increased population weight is linked to the rapid rise of multinational corporations and their heightened influence on decisions that shape global trade and food production. Changes in global food systems take the form of fast food consumption, persuasive marketing, expansion of processed foods, and the increase in the intake of energy-dense foods (Swinburn, et al., 2011). Freer food trade between countries and reduced import barriers has

resulted in the increased distribution systems of products such as cheap vegetable oils and refined fats in developing countries and their consumption by low-income families. The growth of convenience stores and multinational food chains has replaced fresh food markets as the dominant food source in parts of Africa, Asia, and South America (Popkin et al., 2012).

A study conducted in Mexico on the impact of the increased export of highly processed low nutrient foods from the United States indicated that the incidence of overweight and obesity almost tripled between 1988 and 2006 (Freudenberg, 2014). This has resulted in a 'nutritional transition' defined by Popkin (1998, p.6) as shifts that occur in human nutrition as a direct result of changing agricultural patterns and socio-economic status which result in dire consequences for availability and access to fresh food at low cost.

3.3 South Africa's Nutritional Status

The nutritional status of an individual or a community is based on several factors that interact with each other (May, 2017; Shrivastava et al., 2014; Statistics South Africa, 2019b). In determining the nutritional condition of a population, factors such as diet assessment, health, and diseases associated with dietary intake, the social-economic status of the population, geographical location as well as household characteristics must be taken into consideration when determining the nutritional status. It is therefore critical to understand the socio-economic and political situation of a population when carrying out a nutritional assessment to determine levels of vulnerability and design programs for interventions. According to Faber and Wenhold (2007) using one approach to assess nutritional status can lead to misleading findings. The use of dietary intake should not be used independently in measuring nutritional status but rather level of malnutrition, overweight and obesity are key determinants of a person's nutritional intake. A nutritional assessment helps in the assessment of nutritional disorders in children and adults. For example, malnutrition in children is highly associated with stunting for children and obesity for adults.

Faber and Wenhold (2007) state that measuring nutritional status should include dietary intake, anthropometric assessments of body size, biochemical and clinical methods. Such a combination of methodological techniques has the potential of generating a meaningful interpretation of the results in conjunction with people's socioeconomic status. This research adopts such a wide methodological technique in assessing the nutritional status of Khayelitsha and Mitchells Plain. To archive this, the study reviewed the nutritional status of South Africa which has a direct bearing on the population on Khayelitsha and Mitchells Plain.

In 2002, the South African Government instituted the Integrated Food Security and Nutrition Programme (IFSNP) as one of its measures to address the problem of malnutrition in the country (Drimie and Ruysenaar, 2010). This Social Cluster program had a goal to completely eradicate malnutrition, hunger, and food insecurity by the year 2015. Malnutrition is highly associated with child mortality. In 2001, Schroeder estimated that more than half of the death of children aged 6-59months in developing countries and sub-Saharan Africa in particular was associated with malnutrition (Schroeder, 2001). To address the problem of malnutrition, hunger, and food security, the Department for Social Development, working in collaboration with IFSNP, implements a National Food Emergency Scheme which targets vulnerable South Africans especially those living in rural areas. In addition, interventions such as The National School Nutrition Programme and the National School Feeding Programme are being implemented at school levels. However, since these programs only focus on children attending Early Childhood Development Centres (ECDs and those in primary schools, children without any formal education are left out.

Malnutrition is highly associated with child mortality. Steyn et al. (2006) state that under and over-nutrition coexists in many poor South African households and is associated with the death of more than half of children under five years in developing countries. Faber and Wenhold, (2007) made two critical suggestions as possible intervention strategies to address poor nutrition in South

Africa: increase in the variety of nutritious food for households and communities, and secondly, develop health intervention programs to address the malnutrition on children.

3.3.1 National School Feeding Program (NSFP)

The National School and Feeding Program (NSFP) of South Africa were developed as a policy intervention strategy to address the problem of malnutrition in children. Feeding schemes have been used by Governments, NGOs, and International Organisations such as the UN World Food Programme which has as objective to address the problem of hunger in a crisis, enable households and communities to be able to meet their household foods (Briggs, 2008). In 1994, the Government of South Africa introduce the NSFP also known as Feeding Scheme, to address the problem of malnutrition and hunger especially amongst the black population that had suffered from severe discrimination during the apartheid regime.

Since the implementation of NSFPs, many studies have evaluated the impact of such programs have had a significant impact on improving the nutritional status of children and its impact on educational performance and the cognitive wellbeing of children. It has also contributed to reducing hunger generally and malnutrition in particular. Malongane and Mbhenyane, (2017) assessed the nutritional status of children in Capricorn District in Limpopo and found that children who received food from the NSFP were found to have improved and acceptable nutritional status, measured by the level of their anthropometric assessments.

According to Malongane and Mbhenyane (2017) school attendance increase for children who receive food from the NSFP. In addition, Meyers et al. (1989) assessed the participation of children from low-income households in a School Breakfast Programme. The study found that children who participated in the breakfast program experience a significant change in their school performance. (Napier et al. (2009) assessed the nutritional status of children from three groups of selected schools in Gauteng Province in South Africa. The results were consistent with previous studies on the impact on school feeding on children's nutritional status.

However, over the years, evidence continues to suggest that nutritional standards for SFP is beginning to drop. Nhlapo found evidence of nutritional deficiencies after a random survey of SFP in South Africa (Nhlapo et al., 2015). In the 40% food met the standards for aged 11-18 years while just about 10% of meals met the standards for calcium and zinc. For children 711years old, only 30% of the food met the iron standards. A recent evaluation of the school nutritional environment suggests that children are exposed to unhealthy foods in the school environment (Okeyo et al., 2020). Chapter seven of this research address some of the gaps in the literature with respect to children buying food and eating away from home.

3.4 Prevalence of overweight and obesity

3.4.1 Global trends of overweight and obesity

Obesity is one of the biggest issues affecting the current world population. A few decades ago, obesity was largely associated to develop countries. Such perspectives and beliefs have long been cabbaged due to rising trends of obesity worldwide. In the early 20th Century, the World Health Organisation (WHO) drew the words' attention to the increase Body Mass Index (BMI). Several studies have therefore been carried out over the last 20years and more, to study the trends of world overweight and obesity globally (Akpa et al., 2020; Onis et al., 2010; Popkin and Doak, 1998; Seidell and Halberstadt, 2015; H. Yatsuya et al., 2014). Popkin and Doak, (1998) assessed world obesity trends by analysing several nationally representative sample data. To identify the forces affecting these trends, the study found evidence that the then low and middle-income countries such as Brazil, China, Russia, Mauritius, Kuwait, and Western Samoa were experiencing high levels of obesity. Albeit these evidence of obesity in the late 1990s and 1990, many countries were still oblivious of the disease.

By 2014, worldwide obesity had risen to 1.9 billion adults classified as overweight and obese. About 600million (13%) were obese (WHO 2016). It was also stated found that from 1980 to 2014, the prevalence of obesity worldwide had doubled. Between 2000 and 2010 overweight and obesity

amongst children increased by 31% in the prevalence of early childhood. According to de Onis et al. (2010), overweight and obesity in children were forecast to reach 31% worldwide by 2020.

Global obesity trends vary by country and by region. In a study conducted by Yatsuya et al. (2014), to understand the trends of overweight and obesity worldwide, the study found that 61% of Americans, 54% of Europeans, 46% of Eastern Mediterranean 46%, 13% of South-East Asians, and 26% of Africans, were overweight and obese. The low prevalence observed in Africa (26.9%) does not exonerate Africans from the effects of the pandemic.

WHO report of 1990 was timely to sensitize world leaders and the world population of the risk of obesity (WHO, 1997:17). The report showed that obesity was highly prevalent in urban areas. Other WHO research found that 62% of the American population were overweight and obese, 14% of East Asia were overweight and obese and just about (WHO, 2008). Bentham and Collaboration (NCD-RisC), (2017) undertook a study of world obesity from 1975 to 2016. The study analysed 2416 population-based measurement studies in 128·9 million children, adolescents, and adults. The authors state that obesity increase amongst men from 31million in 1975 to 281million in 2016. Women living with obesity grew from 69million in 1975 to 390 million in 2016. These results have a long change with increasing globalization and change lifestyles, especially in Africa.

3.4.2 Trends and prevalence of obesity in Africa

The obesity pandemic is a major public health concern in Africa. Ng et al. (2014) found that in North African Countries, Libyan women had the highest obesity incidence at 57.2%, whilst 30.2%of Libyan men were classified as obese. Asfaw (2006) found that South African and Senegalese obese patients were far more likely to face the risks of arthritis, asthma, diabetes, and heart diseases than their lean counterparts.

Evidence in sub-Saharan Africa shows that obesity was more prevalent amongst adult males in the Central African Republic 13,2%, compared to Angola with 18% of women were obese (Ng et al.,

2014). In Botswana, about 50% of women were clinically diagnosed to be overweight and obese at the same period in which 13.5% of South African men were found to be obese compared to 42% of South African women. Botswana, (Letamo, 2011) found a significant association between women with obesity and their socioeconomic status, their age, level of education, living in the city, and being married. In Egypt, about two-third of women are overweight and obese.

According to Asfaw (2006), obese patients in Africa are at risk of noncommunicable diseases such as asthma, diabetes, arthritis, and heart diseases. South Africans were found to be more susceptible to heart diseases than obese patients in Senegal. Adeboye et al. (2012) examined the pattern of obesity in Africa. The study confirmed other findings that shows a higher prevalence of obesity in urban areas. With an increase in urbanization in Africa, the reveal that changing food consumption patterns, access to processed foods, and less physical activity were associated factors to weight gain in Africa's urban areas. In addition, Kengne et al. (2013) accessed the relationship between obesity and diabetes mellitus in Africa over ten years from 2002 to 2012. They found a strong association between the increase in diabetes and obesity. This parallel relationship showed that physical inactivity and dietary change were significant factors that intensified insulin resistance (Kengne et al, 2013).

Poverty and inequality are contributing factors to obesity in most developing countries. Ziraba et al. (2009) analyzed national health survey data from seven countries in sub-Saharan Africa and found that in the period 1993 to 2005, obesity was higher in poorer households by 35% in the ten-year period compared to wealthy households. This finding contradicts global trends which indicate that more wealthy households in low- and middle-income countries tend to be overweight. In Adeboye, Giovanna, and Rolland (2012), a positive relationship between obesity and higher socio-economic status was established. This may suggest that while obesity was rising in general, richer households were able to curb its increase compared to poor households. The results were similar regarding the education variable. Whereas all the studies reviewed focused on different aspects of

health, they all confirm that obesity is rising rapidly in Africa (Adeboye et al., 2012; de Onis et al., 2010 and Ng, et al., 2014). The above authors also agree that there is an established link between obesity, nutrition transition, and some chronic diseases like hypertension and diabetes.

3.4.3 Trends in child overweight and obesity

The increase in the number of obese children has also drawn the attention of policymakers and researchers worldwide. Overweight and obesity have risen substantially amongst children over the past four decades. Despite scarce data on child obesity in middle and low incomes countries, evidence from available data portrays a sharp rise in the prevalence of child obesity (Lobstein et al., 2015). This poses a serious global health problem. In a recent study (Bentham and Collaboration (NCD-RisC), 2017) found that in just 40years, there has been a 10-fold increase in obesity amongst children 5-19, that is, from 11million to 124 million in 2016. In addition, 216 million children of the same age bracket were estimated to be overweight.

3.5 Obesity in South Africa

Several studies on obesity have been carried out in South Africa especially since early 2000. Many of these studies have looked at the pandemic from different perspectives, such as determining the trends, government response, urbanization as a major contributor, food security, nutrition and health transitions (Friel et al., 2007; Igumbor et al., 2012; Kruger et al., 2005, 2006; Pirgon and Aslan, 2015; Thandi Puoane et al., 2002; South Africa and Institute of Race Relations, 2013; Vorster et al., 2000, 2005b).

Overweight and obesity will continue to linger in the South African Public Health report as long as strong policy decision is not taken to address the pandemic. In the late 1970s, obesity prevalence for South African women was becoming a cause for concern. As of 1990, the prevalence of obesity in South Africa showed 44% of women compared to men 7% at BMI ≥30 (Popkin and Doak, 1998).

Some of the findings on these studies and more have only pointed to the increasing evidence that South Africa's population is undergoing nutritional and health transition that needs urgent policy interventions. In addition, some of the findings have shown an increasing trends in childhood obesity. Mollentze (2006) made a call for action as early as 2006 for a speedy intervention in childhood obesity. Given that several clinical evidences of obesity now exist at national level, many researchers have also contributed in providing evidence at local community levels with varying samples to measure the extent of the pandemic (Ngwenya and Ramukumba, 2017; T. Puoane et al., 2002; Temple et al., 2001).

Furthermore, another dimension of studies carried out in South Africa has focused on age disparity in the prevalence of the disease. A wide variety of research has focused on obesity prevalence at schools (Armstrong et al., 2006a, 2006a; Case and Menendez, 2009; Van Der Merwe and Pepper, 2006).

However, the extent to which South Africans see obesity as a health risk is concerning. South Africans are known to have adopted a tranquil attitude towards personal weight gain and other health-related issues(Draper et al., 2019, 2016). According to Statistics South Africa, (2013) in circumstances with less serious health conditions the majority of South Africans undertake self-medicate rather than consult a health care provider. One of the major reasons advance for this kind of approach and attitude to health care is poverty and inequality. Treatment is "too expensive' or 'health services are too far' (inaccessible) or 'not necessary/problem not serious enough" (Statistics South Africa, 2013, p.94).

According to Skaal and Pengpid (2011), a similar attitude was prevalent among health care workers. There is need for a change in attitudes with regards to weight gain and weight management. In a survey of healthcare workers and non-healthcare workers, the authors found that 55% of healthcare workers considered their weight to be normal compared to non-healthcare

workers. About 61% of none-health care workers were satisfied with their body weight despite 37% of the sample being clinically obese and 9%% were severely obese.

Devanathan et al. (2013) concurred when they found showing that despite 76% of black women in the Durban city of South Africa being clinically obese, only about 27% perceived themselves as having a large body image. The study further showed that about 99% of obese women associated thinness with HIV/AIDS. In Northern Cape Province of South Africa, a similar attitude was prevalent and reveal that of the 72% of respondents who were obese, only 14.6% acknowledged that they were clinically obese (Hoffmann 2013). Most of the respondents in this study reported obesity-related illnesses like hypertension (24.3%), T2D mellitus (8.4%), and arthritis (6.3%) whilst some perceived obesity as a symbol of wealth and comfort in life and beauty.

Despite clear evidence that points to the rise in overweight and obesity in South Africa, the challenges posed by people's perception of the disease and its impact on health, poses a huge challenge to fighting the pandemic Devanatha et al. (2013) and Hoffmann. (2013). Studies by the South African National Health and Nutrition Examination Survey (SANHANES-1) conducted in 2013 show that more than 63% of South African women were obese. The findings of SANHANES-1 added 69% of men were happy with their body weight' (HSRC and MRC, 2013). Furthermore, children who are 0 to 14 years were found to experience increase body weight. Girls were significantly heavier 27kg compared to boys 24kg. Girls were marginally taller than boys with the height measured in centimeters (cm) (HSRC and MRC, 2013). Reflecting on the overall findings leads to the conclusion that obesity is on the rise in South Africa and amongst one of the highest in the African region, affecting all age groups.

3.5.1 Determinants of overweight and obesity

Several factors contribute to weight gain and increase body sizes and these factors are not limited to specific countries. There are multiple interactive causes such as lifestyle and behaviors that play a role in the global increase of overweight and obesity(Mchiza et al., 2020; Shisana et al., 2014b).

While many studies have identified some of the major factors contributing to overweight and obesity globally and locally (Kruger et al. 2005; DOH 2006; Kruger et al., 2006; Prentice 2006; de Onis et al. 2010; Jones-Smith et al. 2012; Kanter and Cabellero, 2012; World Health Organization - WHO 2014; WHO, 2016), this study has only considered a selected but relevant few indicators.

Dietary inconsistencies: Evidence of poor eating habits are associated to increase body weight (Al-Rethaiaa et al., 2010; Oellingrath et al., 2013; Zeng and Zeng, 2018). Poor eating habit is related to undernutrition and overnutrition (Williams and Suchdev, 2017). Dietary consumption and energy imbalance are highly associated with overweight and obesity. It is also related to eating disorders in dietary consumption and energy expenditure. Poor dietary habit is the consistent consumption of food low in dietary fiber, micronutrient or the over dependence on carbohydrate related products. It involves the over consumption of sugar sweetened and food high in fat content without a counter energy expenditure in the form of physical exercise, or dietary supplements (DOH 2006; Cecchini et al., 2010). Poor eating habit is associated with increased risk of high blood pressure, coronary heart disease, stroke and diabetes mellitus as well as increase mortality rates worldwide (National Institute of Health 2000; National Strategy 2015).

Besides global trends and of increasing body size described above, there are multiple interactive causes and behaviours that influence the global increase of overweight and obese populations. A great deal of literature is available on determinants of overweight and obesity both in developed and developing countries. These include de Onis et al. 2010; DOH 2006; Guiliford et al. 2003; Jones-Smith et al. 2012; Kanter and Cabellero, 2012; Kruger et al., 2006; Kruger et al. 2005; World Health Organization - WHO 2014; Prentice 2006; WHO, 2016. A number of possible explanations have also been put forward which will be discussed below.

A major factor associated to increased body weight relates to the mismatch between dietary consumption and energy expenditure. Eating habits, which include both under- and overeating, of

foods low in fiber, sugary drinks, and with high-fat content are attributes of unhealthy eating (DOH 2006). Poor eating habit contributes to increase risk of death globally. In the US, unhealthy eating contributes to 678,000 deaths each year (CDC, 2012; National Institute of Health 2000; National Strategy 2015).

In most parts of Africa, the larger body size is viewed as a symbol of beauty and fertility and is a general traditional stereotype throughout the continent. Socio-cultural beliefs and practices also appear to influence body size in countries such as Jamaica, where obesity in women is viewed as favorable and associated with maternity and nurturing, whilst in East Asia and the Pacific increased body weight is associated positively with increased socio-economic status (Kanter and Cabellero 2012).

Several studies have revealed that women are more likely to become obese compared to men (Prentice, 2006). This was however ascribed to the variance in physical activity, sociocultural dynamics, and biological changes and differences (Kanter and Cabellero, 2012). NCD Risk Factor Collaboration, (2016) conducted a global survey of 200 countries and targeting 19 million people to underscore the gender disparities in obesity amongst adults. The evidence showed that world obesity increased from 3% to 10% in the period 1975 to 2014. Obesity in women increased by 8% and men 3% in the same period. Loring and Robinson (2014) 7 argue that obesity in women is largely associated with their lack of participation in physical activities, which is also due to cultural and traditional gender inequality. Traditional and cultural norms prevent women from participating in several social and economic activities thus discouraging teenage girls' and women's participation in organised physical activity (Kruger et al. 2006).

South Africa is known for high prevalence in gender-based violence, drug-related crime and general insecurity surrounding most of the poor communities (Jank, 2013). Participating in physical activity depends on the neighborhood and the level of security, for women and children

participating in physical activities for women and children in urban areas include safe places to exercise, particularly in low income, disadvantaged areas.

While many studies confirm that BMI rises with increased age amongst both male and female adults, there is a significant correlation between increased body fat and the postmenstrual period for girls (Kruger et al. 2009).

Socio-cultural factor: Eating habits are not solely interpersonal, but are also cultural and socially influenced. In chapter 3, social-ecological model and social comparison model were applied to this study to provide such an understanding of the socioecological environment of obesity. are cited as factors that play a significant role in obesity levels. The role of culture and cultural preferences are associated with overweight and obesity among different groups in society. DeAnglis (2008) defines culture as shared beliefs, values, learned and practiced by a particular group which are generally transmitted to the next generation and influence one's thinking and action mode (Kanter and Cabellero 2012). Thus, the role of culture in obesity prevalence must not be underestimated. Food is a critical part of human existence and therefore household food consumption behavior become symbolic and gradually integrate into the society. For example, in many African countries and South Africa in particular, larger body size is viewed as a symbol of beauty and fertility and as evidence of good living. These cultural behaviours are now traditional stereotype throughout the continent. Socio-cultural beliefs and practices also appear to influence body size in countries such as Jamaica, where obesity in women is viewed as favorable and associated with maternity and nurturing, whilst in East Asia and the Pacific increased body weight is associated positively with increased socio-economic status (Kanter and Cabellero, 2012).

Demographic factor: Gender and Age: Several other studies have shown the correlation between gender, age, and obesity. Women are more susceptible to gain weight compared to their male counterparts (Prentice, 2006; Kanter and Cabellero, 2012). However, with the realities of globalisation, the trends of more men becoming obese are growing fast. Women have been

severely disadvantaged for long and these disadvantages have contributed in establish a norm for women culturally such as not participating in sporting activities (Loring and Robinson (2014). In addition, urban and peri urban areas have greatly limited women's participation in physical exercise due to the insecurities sounding many urban peripheries. While many studies confirm that BMI rises with increased age amongst both male and female adults, there is a significant correlation between increased body fat and the postmenstrual period for girls (Kruger et al. 2009). In this context, the Theory of Justices was applied to this study to show the injustices of society that continue to create an unfair environment for women and children live a normal life. Several communities have now become an environment for the strong. Moreso, to highlight the need for justice in protecting against obesity through policies that will contribute to social justice for women and children suffering from the pandemic.

Economic factor: A review of the literature reveals a rather multifaceted link between income and obesity. Although obesity is on the increase globally, Mullie et al. (2011), referring to a study conducted in 76 countries, found that obesity increased along with the GDP of a country. This study, together with many other research efforts, revealed that greater obesity rates in high-income countries are generally found amongst lower socioeconomic status groups, whereas in lower-income developing countries overweight persons are more likely to enjoy higher socioeconomic status (Guiliford et al. 2003). This finding was confirmed by Jones-Smith et al. (2012) who analyzed national trends in overweight and obesity status using the DHS wealth index and education and cross-sectional data on women from 37 developing counties. The data revealed that in 27 cases there was a positive link between higher socioeconomic status and the prevalence of increased body weight (Jones-Smith et al. 2012). Furthermore, the data revealed that an increase in body mass was aligned to increases in income levels and that the prevalence of overweight persons in high and upper-middle-income countries was double that of lower-income areas (WHO, 2008).

3.6 The Concept of urbanisation

Urbanisation is increasing worldwide especially in developing countries. Since 1950, the world urban population has grown from 751 million to 4.2 billion in 2018(United Nations, 2018). Emerging economies are experiencing large rural-urban exodus which has a significant impact on urban sprawls. In 2018, the United Nations Department of Economic and Social Affairs reported that 55% of the world's population currently lives in urban areas. The report projected that the world urban population is likely to increase to 68% of which about 90% of the increase will occur in Africa and by Asia by 2050 (United Nations, 2018).

McGranahan, & Satterthwaite (2014) undertook a critical review of the concept of urbanisation. The authors began by citing some of the conceptual flaws in defining urbanisation. Some of these conceptual confusions as described by the authors come from the differentiation of what is urban and what is urbanisation, the use of population size, administrative status, and population characteristics that is the difference between urban and rural areas. Given the already complex dynamism of the growth of cities and the neoliberal conception of development and underdevelopment, population growth estimation for a rural area in a developing country are conceptually and statistically different when a town is being classified as urban.

The Department for Economic and Social Affairs at the United Nations Population Division, understanding these complexities in drawing a fine line between cities and towns, urban and rural concluded the socioeconomic process of transforming or converting and [even just mere renaming or providing a new status in a one's rural area into an urban status [my emphases] can be described as urbanisation (UN, 2019). It may include the shift in the demographic structure, changing lifestyle, occupation, and culture.

Urbanisation impacts on the spatial distribution of urban land use between public and private entities as well as the general public. In addition, with respect to the built environment, new development housing as well as the spatial distribution of economic resources, the transport

network, and in some instances the creation of a new urban rurality (Belebema, 2019). According to the UN (2019) report, the urban share of the population is measured by the percentage of people living in urban towns and cities. For purposes of context in this study, this later perspective remains and will remain the main determining point of departure for policy development especially in Sub-Saharan Africa.

Urbanisation is also generally conceptualised as a shift from rural to urban land space as population migration takes place (McGranahan, & Satterthwaite, 2014; Awumbila, 2017). The urban spatial expansion especially in emerging economies like South Africa is a critical development indicator necessary for urban spatial planning and development. In sub-Saharan Africa, which is often referred to as the world's fastest urban region, about 472million people now live in urban towns and cities. The growth of Africa's urban population is estimated at 11% by 2050 (Awumbila 2017). Since urban areas turn to create elasticity in job creation opportunities and offer a collection of multi-sectoral skill and unskilled level avenues for employment, more rural or semi-rural areas will continue the drift towards the urban area for livelihood. Whilst Macintyre, Ellaway, and Steven (2002) states that urbanisation creates a doubles burden of over- and undernutrition in destitute households.

3.6.1 2 South Africans Population on the move

South Africa's urban population has been on the rise since the 1980s while leading to a decrease in the rural population. The rural population decreased from 46% in 2001 to 36% in 2016 (Dinababo, et al., 2017). The majority of the migration in South Africa occur between rural and semi-urban and urban towns and cities. In the Western Cape, 30% of the population of the City was born outside the province, and the majority coming from the Eastern Cape Province. Nearly 60% of the poor live in rural areas. High levels of poverty, unemployment, poor service delivery are the main drivers of rural to urban movement. About 60% of poor people live in rural areas

which are 2.2 times the ratio of poor urban dwellers (Statistics South Africa, 2011; Dinababo, et al., 2017).

From a UN perspective, data shows that South Africa is more urbanised than rural. According to the UN Report in 2014, about 64.3% of the country's population (34.17 million people) live in urban areas, compared to 35.7% (18.9 million) rural dwellers in mid-2014. It is further stated that the country's urban population is likely to reach 77% (49million people) of the projected 63.4million in 2050. These growth in urban populations in South Africa are higher than the Southern African average and that of sub-Sharan Africa (BusinesasTech, 2014). Rural-urban exodus is the major cause of the current increase in urban population (Dinababo, et al., 2017). Urbanisation has a major impact on the destination towns and cities as well as on the rural area or region of origin. Urbanisation resulting from migration is leading to urban sprawls for many cities in Africa and South Africa in particular. These movements have a significant impact on the health of the migrants caused by changing lifestyle, built environments and other socioeconomic challenges.

3.6.2 The Impact of Urbanisation

Keeping the worlds' population is a global challenge for public health. The burden of communicable and NCDs has increased rapidly over the last two decades especially in developing countries. Globalisation, urbanisation and the rapid nutritional transition to the westernised diet, overconsumption of food high in saturated fats, sugar-sweetened beverages and sedentary lifestyle are found to be highly associated to increasing levels of obesity and cardiovascular diseases (Boutayeb and Boutayeb, 2005; Joshu et al., 2008). Evidence from developed countries has shown a strong association of urban sprawl and an increase in overweight and obesity (Ewing et al., 2003).

In the UN 2014 Report According to the United Nations more than half of the world now live in urban areas. [2]

An additional critical aspect of the rapid increase of obesity worldwide is that it is saturated in urban areas and that rural/urban migration plays a pivotal role in the rising global obesity pandemic. Many studies suggest that the availability of and easy access to food in urban centers is a significant determining factor in the incidence of increasing body weight (Ziraba et al., 2009). One of the reasons put forward for this increase is that energy expenditure typically decreases due to more sedentary lifestyles in urban settings (Cabellero, 2007). Urbanisation produces new household consumption patterns and dietary habits which go hand in hand with increased body weight and which constitute a major risk factor for NCDs (Mokhtar et al., 2001). A comparison of rural/urban consumption patterns of African populations reveals that traditional diets of urban households are abandoned and exchanged for western diets typified by a decrease in the consumption of fibre and increased consumption of fat and carbohydrates (Bourne et al., 2002).

Increased urbanisation is linked to the increased consumption of low nutrient, high fat, energy-dense foodstuff. Higher incomes in urban areas and the increased availability of and accessibility to convenience meals at fast food outlets result in overconsumption, while the urban environment is less conducive to physical activity (Swinburn et al., 2004). This is due to pollution, unsafe neighbourhoods, the design and form of urban suburbs, and the lack of sidewalks (Lopez and Hynes, 2006). Revolutionary changes in the media have resulted in excessive television viewing in urban households and the advertising of food in a variety of formats (Contento et al., 2006).

It is within this backdrop that adults and children trapped in poverty and inequality in Khayelitsha and Mitchells plain are most vulnerable to unhealthy food choices, susceptible to overweight and

[2] United Nations, Department of Economic and Social Affairs, Population Division (2019). World Urbanization Prospects 2018: Highlights (ST/ESA/SER.A/421)

obesity. Current policies put in place do not sufficiently address the obesity crisis in South Africa. There is no legislative framework for the protection against overweight and obesity in adults and children in South Africa.

3.7 Conclusion

Evidence of food insecurity has continued in South Africa despite the country being nationally food secure. Globally food security has remained a challenge for government, and civil society as a whole. Polices of food security face multiple obstacles with regards to enforcement. Many governments find it difficult to strike a balance between markets and food security policies which if enforces will grant greater access to the poor and vulnerable in society. In South Africa in particular, food security problems have been described as and wicket. This complex terrene of the food industry has created an impure, complex, and wick system (May, 2017) making it difficult for the poor to access food at affordable prices within their limited resources. In addition, despite the human right approach to food security for all, enforcement of those rights poses economic challenges for the government. Addressing the BIC in food policy is limited to providing social grants which are themselves insufficient to meet the needs of vulnerable children. With the rising levels of child obesity in South Africa, there is yet to be a clear policy guideline that seeks to ensure that children are not only protected from crime, but also from hunger, stunting, and obesity. One of the key messages for this research is to state upfront, the need for a well-structured legislative framework that will be enforceable at level regardless of its economic and political implications to ensure that poor South Africans have access to food at all times in the right quantity and quality.

Given that there are shreds of evidence that points to the rise in overweight and obesity in South Africa, the state of food insecurity manifested in malnutrition, overweight and obesity stunting in children, this research seeks to contribute to knowledge through a critical interrogation of how the BIC response to the problem of child obesity in South Africa. In addition, does the current policy

framework sufficiently address the problem of weight gain in South Africa. Chapter four develops the theoretical and conceptual framework of the study. The chapter amalgamated the theory of justice, the social-ecological theory, and social comparison theory. The objective was to show the critical role of justice in the form of human rights and the BIC in the ecology of obesity and parent and child environment.

Chapter 4

THEORETICAL AND CONCEPTUAL FRAMEWORK

4.1 Introduction

"Overcoming poverty is not a task of charity, it is an act of justice... Like Slavery and Apartheid, poverty is not natural. It is man-made and it can be overcome and eradicated by the actions of human beings." **— Nelson Mandela**

The relationship between food choice and body mass index is complex and requires multiple theories to provide insight into food choices, food consumption processes, and behaviours. Food consumption behaviour is associated with various socio-political, economic, and cultural constructs that demand various theories to give it meaning (Pinstrup-Andersen, 1993). First, food consumption and food access are centred on the broad concept of food security, which in itself is complex, and requires the integration of theories and concepts to gain knowledge of its impact on humanity. Human and economic behaviours are integrated concepts and affect the way people make food choices decisions or how they access food resources to meet their food and nutritional needs. But where there are structural injustices in relation to food access, food availability, or being in possession of available means to access food and nutrition, the poor fall prey in the hands of the powerful. This provides a theoretical and conceptual framework for understanding the relationship between food choices and body mass index in adults and children and to show a right-based approach to addressing the obesity problem in Khayelitsha and Mitchells Plain. It Linked human and children right to justice, food, and health of people living in townships in Cape Town. The objective was to understand the association of BMI and food choices in urban townships in Cape Town.

4.2 Theoretical framework

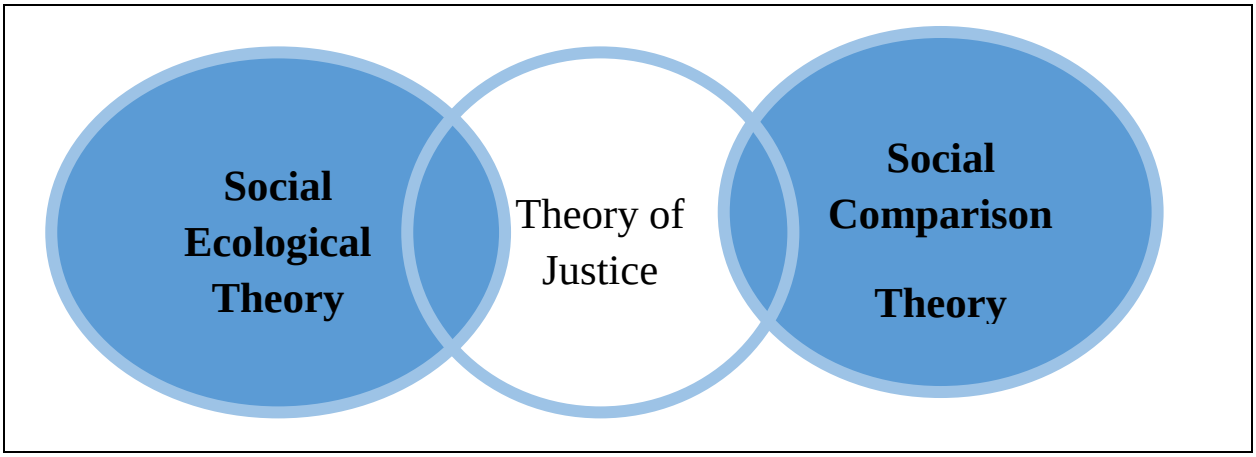
The interdisciplinary nature of the concepts of malnutrition, overweight, obesity, and food insecurity cannot be explained outside their socioeconomic, political, and cultural linkages (Berkes et al., 2000; Levin et al., 2013). This jigsaw characteristic of the concepts makes it suitable for multiple theoretical examinations. Though the chapter attempts to provide such a theoretical background of the subject, it should be stated that a complete framework is impossible at this level. But the aim however was to find their meeting points and take advantage of these points of convergences to promote greater socio-political and legislative engagements to reduce the increase of child and adult obesity in South Africa. In this context, Higginson, McNamara, SRX Dall (2017) concluded that there is, there is need to develop human-specific behavioural theoretical model of body mass regulation that takes and use the information on a holistic view of the subject into account. "We need to work with clinicians, psychologists, and physiologists, among others, which will help to incorporate the human-relevant details to build better theory. This could elucidate what aspects of the environment drives over-eating and weight gain and provide an evolutionarily informed solution to the obesity epidemic" (Higginson, McNamara, SRX Dall, 2017, p.1).

The study applied three theoretical approaches: Social Comparison Theory, Social-Ecological, and Theory (SET) and Rawls Theory of Justice. Social- The theory of justice as postulated by John Rawls is therefore advanced as a central theme to food justice for poor households in South Africa. Within this context, the theory was found as relevant in understanding and contextualizing food choices decision making.

Another aim of this chapter was to provide a background to the right based approach to food and to show that in the context of the current study, no greater emphases have been given to address the problem of overweight and obesity as associated with food choice, determined by the social and economic status of the population. It establishes the existence of a lack of strong legislative

framework and policies that could pave the way to reduce overweight and obesity in adults and children in South Africa and Khayelitsha and Mitchells Plain in particular.

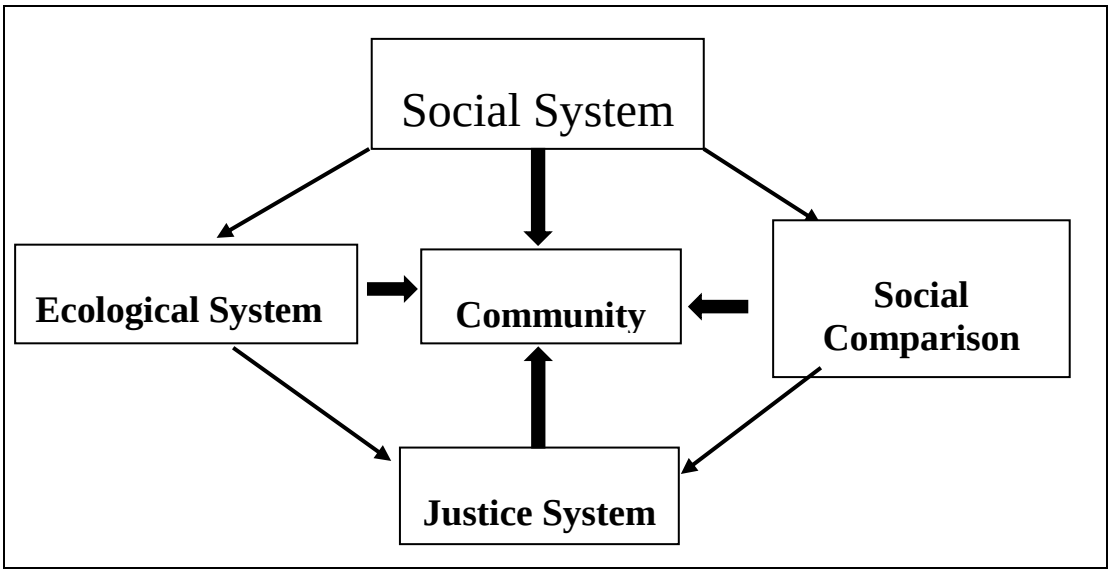
Figure 4-1 Justice as a central theme of the ecological systems



Source: Author's hypothetical model

Figure 4.1 shows the interactions between a social system and other systems in the natural and social-ecological systems. Thus, there exist social-ecological systems, Social Comparison, and Social Justice Systems. According to Colding and Barthel (2019) excluding one system could lead to great disruption in the human ecological framework. Berlow (1999) found that within the biological or natural ecology, excluding an individual or individuals in a community because of presumed insignificance causes great disruption. In this context, the author held that everyone in the community is critical for the existence and development of the community.

Figure 4-2 Social-ecological interactions



Source: Author's hypothetical model

Figure 4.2, the ecology of humanity seeks to uphold the wellbeing of all in any community of people. However, where there is injustice in the human ecology the weak in comparison to the strong tend to suffer. The role of the state becomes critical as the custodian of the justice systems to ensure equitable access to resources. This relationship between the State and ecological system is elaborated below under the Theory of Justice.

4.2.1 Social-Ecological Theory

4.2.1.1 Overview of the theory

The Social-Ecological system theory was first developed in the field of ecology in the 1960s (Holling, 1973). However, the theory did not gain sufficient attention until the late 19990s when the concepts of human development and environmental justice began gaining credence in the field of social sciences (Berkes et al., 2008; Colding and Barthel, 2019). Social ecology or social-ecological system is the integration of the natural and human environment. The concept was first used in transdisciplinary research in the Beijer Institute of Ecological Economics in 1998 (Colding and Barthel, 2019). The project which was titled "Dynamics of Ecosystem-Institution Linkages for Building Resilience" was the first scientific attempt to establish a linkage between social-

ecological Systems as a response to generate knowledge of complex adaptive feedbacks. Identifying these critical linkages in social-ecological systems, provided knowledge on human and natural environmental adaptability and resilience (Colding and Barthel, 2019).

In natural sciences, the conventional definition of ecological systems (ecosystem) is the interactions of ecosystems and the various food chains. Colding and Barthel (2019) states that the social-ecological system was first defined as a system-

> "...consisting of two interacting subsystems: the biological (epidemiological ecosystem) and the social (social and economic conditions of life of the society) subsystems where the biological subsystem plays the role of the governed object and the social acts as the internal regulator of these interactions" (Cherkasskii, 1988; cited Colding and Barthel, 2019, p. 1).

The above definition of Charkasskii provides the bases for understanding the interactions between social systems and the natural ecological system. One of the limitations of Charkasskii's definition is that it's limited to social and economic systems and considers the economic systems as a governed object instead of a system in its writ. In this context, this researcher holds that though the is an independent natural ecosystem, the interactions of the different ecological systems as stated above make a complete system of interactions between natural, social, political, and cultural systems. This amalgamation of the social system to the natural ecological systems has as a central element-justice and injustices within the systems. It for this reason that I chose to consider the theory of justice as central to the social-ecological systems and the social comparison systems.

Berkes and Folke (1998) developed the concept as an analytical framework for the study of the linkages between ecosystems and institutions. According to Hodbod and Eakin (2015), social-

ecological systems adapted into the food security systems is aimed to achieve first, food security for all and at all stages as well as to understand the dynamics of maintaining the ecology of food security where human influence in terms of policy objectives and policy design remains a major challenge. In this context, and in the view of this research, overweight and obesity in adults and children coexist within the social-ecological system of society. In Hodbod & Hallie (2015) adaptability and resilience, social-ecological systems is a concept of adaptability of the natural environment as viewed in natural sciences and social ecology of society as viewed by the economic, cultural, technological political, and social spectrum of society (Delport, 2019; Hodbod and Eakin, 2015).

4.2.1.2 Social-Ecological model and social systems

Given the complexities of the social-ecological systems, there exist several social-political or social economic and socio-cultural interactions that need to be taken into considerations to understand the social-ecological systems and their effect on population health. In the social-ecological discussion, and with respect to children's right to food and health, this domain is yet to be exploited to assess the interactions between the ecology of law whether in terms of human rights law, natural law, statutes and case law and the social-ecological system.

Levin (2013) argue that ignoring the interactions of the social-ecological system, defined as the interactions between humans and nature is likely to lead to poor policy decision and policy formation to meet the needs of vulnerable people in a social the system. Cognisance of the social interactions in every ecosystem is the existence of the "weak and the strong", "they have and the have nots". Berlow (1999) states that in ecological systems there are strong and week interactions. The application of the principles of weak and strong in the natural ecosystems to the social-ecological system may lead to undesirable conclusions to justify unemployment, injustice, and inequality. While the natural systems may be well established within the confines of strong and weak, all humans are declared equal before the law (UN, 1948) therefore injustice and

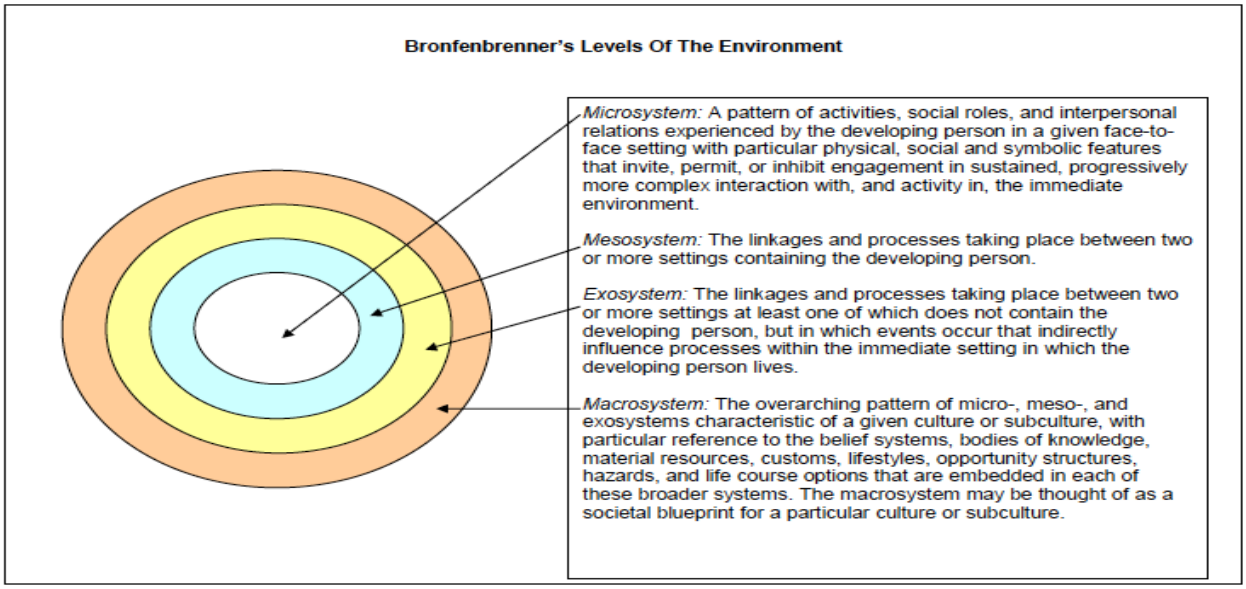
marginalization, whether they be cultural, economic, social, and political, are unacceptable in the social ecology. To better contextualise the ecological system in the present study, Bronfenbrenner's Social-Ecological Model was applied to understand the relationship between obesity in adults and children. Bronfenbrenner's model identified four levels of interaction of the social-ecological system theory.

4.2.2 Example of Social-Ecological Theory

Bronfenbrenner's Social-Ecological Model

Bronfenbrenner's theory of Social Ecology was first developed within the context of understanding human development and behavior (Bronfenbrenner, 1989). Social-Ecological System Theory (SEST) seeks to explain that human behavior is a function of different systemic interactions, operating at varying degrees, that tends to influence human behavior and contributes to the decisions that humans make on their daily choices. According to Piscopo, (2004), considering a range of environmental elements that interact with people in the course of their life, humans are influenced not only by their attributes in making choices but are influenced by other social-ecological factors. According to (Trew et al., 2006) there are multiple levels of influence within the social-ecological system. The model defines the different levels of interaction in figure 3. below.

Figure 4-3 Bronfenbrenner's ecological model



Source: Piscopo, (2004)

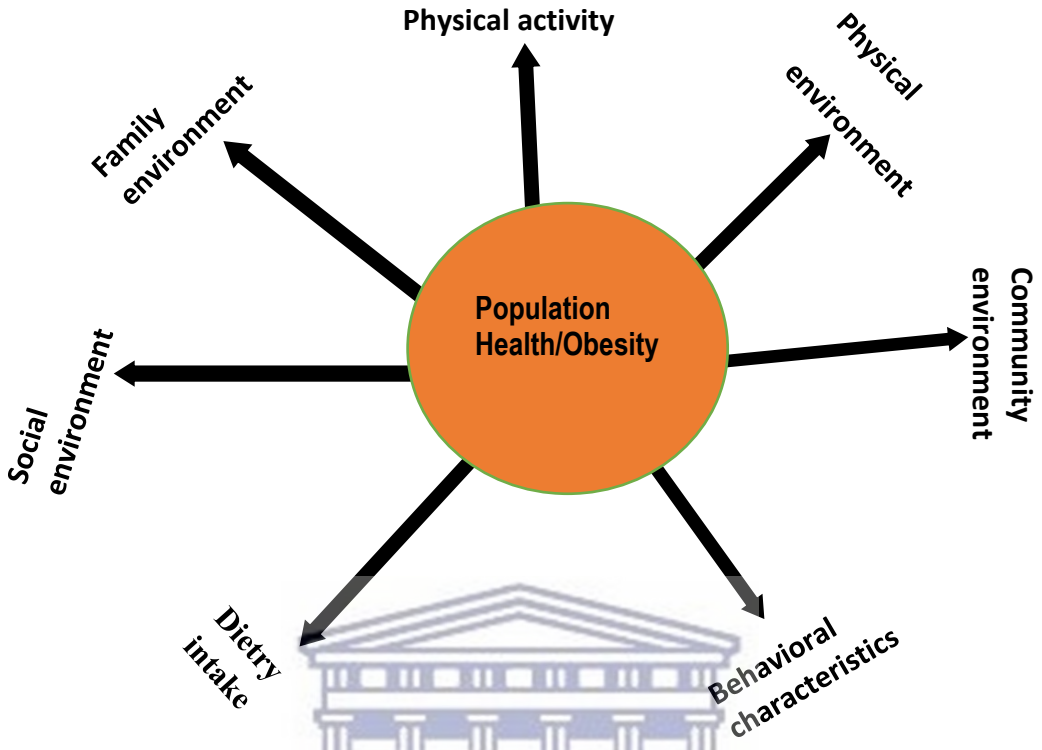
Bronfenbrenner's ecological model acknowledges that individual personal character threats influence their choices to a certain degree but also stated that other ecological factors- the microsystem, mesosystem, exosystem, and macrosystem form the levels at which the SEST impacts on human behavior (Piscopo, 2004). Other researchers have applied the SEST (Story et al., 2002) to identify different multilevel factors that influence behaviors. Haven identified the relevance of the model, it was found relevant in this context to contribute to our understanding of human behavior especially in the context of food security and food choices. While food access and food availability may not be interpersonal the choice of food does and therefore when all other factors of decision making are addressed, people are most likely to make their choices of food.

The ecological model has been used to study the development of children. In Bronfenbrenner (1994) to understand human development, one needs to understand the entire human ecological system with which growth occurs. Going by this perspective, therefore, one of the objectives of this research was to situate the obesity pandemic within the context of this political and social environment.

Thus, addressing overweight and obesity in adults and children requires an understanding of the ecology of obesity within a particular framework. In South Africa for example, unemployment, poverty, and inequality are highly associated with weight gain, besides cultural and other economic disadvantages. An ecological system could have a negative or positive effect on the ecological community. A negative outcome in an ecological system presupposes that there exists an imbalance in the distribution and access to resources. The ecological model has been applied internationally to study attitudes, lifestyle child bullying at schools (Jimerson et al., 2009). In the ecology of obesity (Gordon-Larsen, 1997), children and adults may exhibit different but similar patterns. While parental influence is a critical element in the ecological framework of children, children are not and may not necessarily influence parental lifestyle.

Population health is a function of the ecological environment of the population or community. In figure 3.4 population health or unhealthiness are the results of the changes that take place in the ecological system of the population. Chapter seven and 6 of this thesis dealt with the association of the various factors within the ecological systems of Khayelitsha and Mitchells Plain and shows how these factors influence the eating habits of children and adults.

Figure 4-4 The Ecology of Obesity



Source: ***Author's hypothetical model modified*** **from** (Gordon-Larsen, 1997, p.11)

4.3 Social Comparison Theory

In 1954, social psychologist, Leon Festinger, developed the Social Comparison Theory (SCT). The theory is based on the fact that people evaluate their lives, abilities, opinions through comparison with others who share similar characteristics. In the design of this study, we ask such questions that determine social comparison within the community. How do people view their weight or body sizes compared to their peers of the same age and compared to people of the same community? The theory has provided an understanding of how social comparison in a homogeneous population can be perceived. According to Goethals and Darley (1987) SCT does not focus on individual evaluation is also used to assess group comparisons. However, over the years, several researchers have used the theory to understand human behaviour including obesity

and body image evaluations (Corcoran et al, 2011).

In Fisher et al (2002) the researchers evaluated grad 7 to senior college students using social comparison theory by caring out body image comparison. The study found a significant difference between male and female student's body images related to muscles, weight. In the study, female students expressed excessive or abnormal weight levels along the weight/non-weight continuum and low muscle/non-muscle dimension whereas male respondents emphasized low weight and high muscularity respectively.

The authors concluded that there was a higher dimensional weight loading for students with body sites associated with excessive weight loading with the potential to "indicate a basic cognitive organizational basis for the significant association between elevated comparison tendencies and body image disturbances" (Fisher et al (2002, p.575). Whereas, Krayer et al (2008) seem to suggest that promoting comparison might be protective to some people when allowed to critique on sociocultural norms on which comparison is founded.

However, SCT is not without criticism. Critics of SCT are of the view that though the theory may have contributed to positive self-enhancement in some people, White et al (2006) argue that recurrent social comparison is associated with destructive emotions and behaviors like guilt, regrets, lying and self-protectionism. However, Festinger argues that such negative emotions are due to "unidirectional drive upwards" (Festinger, 1954, p.124). Human beings tend to push for better living standards of their perceived superior comparison which could be their immediate human comparison or the environment, attempt to conform. This concept of comparison was tested in the survey question. Household members were asked to evaluate their health status and actual body mass index in comparison with their immediate environment. The results are presented in chapters six and seven. The evidence suggests that though individuals may be influenced by their environment, there is a degree of awareness and caution when it comes to health-related comparison. The table below shows the different variables that are likely to lead to social

comparison in Khayelitsha and Mitchells Plain. People within a community are likely to undertake silent or open comparison of their health status, income levels, educational attainment employment status as a measure of their level of social standing. It is vital to undertake a comparative analysis of people that are already classified as being of the same social class to estimate if there are any changes or differences within thin ecological systems. In chapter six a comparison of demographic and socioeconomic characteristics is made.

Table 4-1 Comparative variables

Race	Health status	Gender	People	Age2	Education	Income	Social Support	Employment	Sector
Black	Obese	Male	Children	15-25	No schooling	No income	Child Grant	Employed	Public
White	overweight	Female	Adults	26-35	Grade R		OAG	unemployed	Private
Coloured	normal weight			36-45	Primary		DG		self-employed
Indian	underweight			46-55	Secondary		CDG		
	Thinness			55+	Tertiary		WVG		

Source: Author's conceptual model of comparison

4.4 Rawls Theory of Justice

"Considering that, in accordance with the principles proclaimed in the Charter of the United Nations, recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world" (Peable ICESCR, 1966).

John Rawls's theory of justice was first published in 1971 as a philosophical ethics in which Rawls discussed the issues of distributive justice within the social justice ideology (Rawls, 2009). Rawls

who emanated from the Kantian philosophy stream which was a form of social contract school of thought makes use of the Kantian philosophical thinking to develop his theory of justice. Rawls's theory is a political theory that also bears strong social science linkages. Like many other theories, Rawls theory was highly criticised and led to several changes from its original conception in 1971. A modified version of the theory published in 1985 was now focused on "Justice as fairness"(Rawls, 1991).

Before Rawls's theory, Thrasymachus develop his definition of justice from the idea of Socrates. According to Thrasymachus, "the just, is nothing other than the advantage of the stronger" (Stauff 2001.p.63). In Thrasymachus viewpoint, justice is in the hands of the powerful who can make laws and to their advantage. Stauff argued that in Thrasymachus perspective, cities have ruling groups that make laws and those laws must be obeyed by their subjects, thus holding that the law of the city is just and legal. These perspectives are what, as will be seen later in this chapter, that Rawls's theory of justice attempts to deviate from (Stauffer, 2001). Rawls's theory of justice is based on the principle of fairness within a social contract theory of Thomas Hobbes[3] that naturally exists between the state and its citizens (Boucher and Kelly, 2003; Dinbabo, 2011a). Rawls postulate that to achieve fairness in society, communities must be structured in a way that the greatest possible liberties and freedoms [my emphases] be given to people without infringing on the rights of others.

Rawls's theory seeks to provide a succinct understanding of the role of the state as the custodian of justice. The power of the state to ensure fairness and justice towards the weak (the poor and most vulnerable in society). Rawls's objective was to redress the utilitarian stance in the conceptualisation of justice. This formed part of the two core elements of Rawls theory, that is,

[3] Thomas Hobbes was an "English philosopher, scientist, and historian, best known for his political philosophy, especially as articulated in his masterpiece Leviathan (1651). Hobbes viewed government primarily as a device for ensuring collective security. Political authority is justified by a hypothetical social contract among the many that vests in a sovereign person or entity the responsibility for the safety and well-being of all"(Britannica, 2020, p. 1).

first justice should be viewed as a basic human right- the principle of equality and secondly the difference principle and fairness. The second principle explains that there must be an equal opportunity that is accessible and available to all in society. Such social structure is what the general mass will consider as fair and just. A fair and just distribution of economic advantages and opportunities (Julian, 2002).

4.4.1 The Concept of Justice

The term justice is widely used in society today and so within a different context, the meaning of the term is defined. This theoretical background to the concept of justice and injustice and how it impacts on human wellbeing and dignity form part of the core principles of Rawls' theory of justice. Different scholars have attempted to provide a definition of justice but its complexity and its multidisciplinary context make this impossible to find a standard definition (Buettner-Schmidt and Lobo, 2012; Novak, 2000a; Rawls, 1991; Reisch, 2002).

Given the complexities of the term justice, there is yet to be a universal approach to the concept of justice. Different legal systems and traditional as well as cultural systems have evolved in their definition of justice. A historical account of the concept of justice indicates that several theoretical approaches have emerged to establish a standardized definition of the term. The proponent of social contract holds that justice is derived from what is commonly accepted amongst community members (Boucher and Kelly, 2003; Buettner-Schmidt and Lobo, 2012; Dinbabo, 2011a; Sen, 2006). Whereas John Locke views justice as emanating from natural law or natural agreement, John Stuarts utilitarianism approach to justice believed that just is what is in the best interest [of a person, a people, a community, whether there be minority nor majority, poor or rich- my emphases](Boucher and Kelly, 2003). Thus, within the concept of justice, one must pay attention to the following conceptual paradigms of justice and how it has evolved.

Table 4-2 Definition of terms

Concepts	Meaning
Social contract	This is a philosophical ideology that holds that there is a binary relationship between the state and its subjects. The state protects the rights of the subjects and the subjects seed certain of their rights to the state.
Natural law	Natural law is a concept of justice that holds that natural law is universal and fair. It is independent of human influence or man-made law usually of a political order, the state or legislature.
Natural justice	Principles of natural justice are rules established by the Courts as being the minimum protection of the rights of an individual against the arbitrary procedure that may be adopted by a judicial, and administrative system or authority.
Distributive justice	Distributive justice concerns the fair and equitable allocation of resources.
Restorative justice	It seeks to build bridges between victims and offenders as a major to restore communal harmony

Source: Authors compilation

The table may not be exhaustive but prides a summary of the concept and its development over time. Two concepts are relevant for the purpose of this thesis; the concept of Social Contract and the concept of justice. "Justice is the first virtue of social institutions, as truth is of systems of thoughts" (Rawls, 2009, p. 3). The concept of justice itself is broad and spans within the framework of fairness, equity, right, and mercy. These values are the very essence and virtues of social institutions and the family as the nucleus of social institutions in society. Social institutions are established in an ecological environment and therefore are most likely to be affected by institution or removal of social structures within the ecosystem that forms a unique contribution to the social cohesion in the social space (Holling, 2001; Stokols, 1992; Virapongse et al., 2016). It is on this premise that this research integrates the three theories to explain the complex issues that surround

the problem of food choices and obesity amongst adults and children in urban peripheries in Cape Town.

Rawls explains his principle of "Justice as Fairness" buy first assuming a community exists in which men are rational in their thinking as to what they consider to be just and fair. It is also assumed that in such a society there is a clear order in the functioning of the society (Rawls, 2009; Sen, 2006). Rawls calls it the public conception of justice. He argued that despite the existence of a conflict in society if there is agreement about a common sense of justice that is, they understand that:

> Existing societies are of course seldom well-ordered in this sense, for what is just and unjust is usually in dispute. Men disagree about which principles should define the basic terms of their association. Yet we may still say, despite this disagreement, that each have a conception of justice. This is, they understand the need for, and they are prepared to affirm a characteristic set of principles for assigning basic rights and duties and for determining what they take to be the proper distribution of benefits and burdens of social corporation (Rawls, 2009, p. 5).

The term justice is also broadly construed to mean the attainment of that which is just from a layman's point of view. In other words, the concept of justice define by Rawls includes other sub-concepts such as morality, ethics, religion, law, equity, and fairness. The theory of justice is conceptualised under two broad conceptual frameworks: first social justice and secondly procedural justice which deals with the rule of law.

Rawls's principle of justice which was a first attempt to provide a right-based approach to distributive justice argues for the right of the vulnerable in society and the role of the state in providing and ensuring an equitable distribution of state resources (Cohen, 1987). According to Rawls principle of justice, justice guarantees the right of persons, the morality the society, and equal liberties.

Two key principle or philosophical standpoints of Rawls theory is that the theory of justice seeks explains fundamental human right as a principle of justice and assumed that justice guarantees the morality of any acceptable society. Secondly, John Rawls places the State as the custodian of basic liberty and freedoms in a just society (Dinbabo, 2011a; Rawls, 1991, 2009).

Rawls draws from the Social contract perspective of kante, Locke, and Rouseau and argues that the principles of justice are the choices of rational citizens of the society (Miller, 1991; Rogers, 2004). In developing his theory of justice, Rawls made use of the philosophical ideologies of Jeremy Bentham. Bentham's moral philosophy was later developed by Mill who coined it Utilitarianism. Utilitarianism is based on rules and decisions of society and the state that has the greatest good of society. In Rawls theory of Justice, Rawls draws from the utilitarian perspective of justice. The main thesis of Rawlsian ideology was first based on the Veil of ignorance. Utilitarianism is a social just principle that ranks the general wellbeing of society in terms of what is good or bad, just or unjust. Blackorby et al., (2002) describe these utilities as social alternatives where one is a function of another or vis-a-visa such social alternatives according to their goodness. Rawls originally posited all things being equal, the best society is one that is founded on the principles of justice as decided by the people living in a rational society. The assumption is that there is equal opportunity to choose and to make right choices behind the well of ignorance in which they are not influenced by their social status, economic advantages, personal [characteristics, cultural upbringing, environmental circumstances and social networks-my emphases]

In the perspective of Rawls, utilitarianism, the principle of utility produces the greatest happiness to the greatest number of people which is not limited to individuals in the society but also to the organisation of society as a whole (Dinbabo, 2011a; Rawls, 1991). Rawls argues that the theory of justice promotes equality for all individuals and there is no justification for inequality except where such injustices are to prevent a greater injustice in the wider spare of society. In this respect,

Rawls provides the bases for measuring political power over the citizens or the power of the strong over the weak in a social environment. However, some have argued that there is no difference between Rawls's theory of justice based on rationality behind the veil of ignorance and utilitarianism which centers on the greatest happiness or greater wellbeing of society (Rogers, 2004). But in the health context, whether the approach is Rawlsian or Mill, the overall objective of justice is fairness to all regardless of their history, social status, and economic and political affiliations. Justice is a principle that ensures that all citizens have equal access to healthcare, access to nutrition, and economic advantages.

Given the context of the present study which is centred on food choices, overweight, and obesity in adults and children in Khayelitsha and Mitchells Plain, the theory of justice fits into the frame of child justice in South Africa and social justice generally.

4.4.2 Social Justice

The definition of social justice is one of the most contemplated and debated issues since the creation of the term (Atweh, 2007; Jayanathan Govender, 2016; McMillin, 2018). Generally, like all other social theories, finding a conceptual definition is fundamental in understanding the concepts and theories of justice and injustices(Atweh, 2007). But in a case where such a meaning is intangible, researchers have had to manoeuvre around the term to find meaning while not losing its purpose.

Social justice is construed as focused on distributive justice, but more so, it looks at how the disadvantages are shared within communities, in this case, access to opportunities and resources that could change the lives of the poor and needy(Atweh, 2007; Reisch, 2002). Whereas Miller (1991) argued that there is no central system of distribution, one cannot refute the role of government and its institutions as a central system in the distribution process or the execution of justice. “Social justice should therefore level all men in regard to the rights given with their humanity since the Creator has equalized them by nature; man fulfils the intentions of his Maker

by acting according to the norm of this justice"(Burke, 2010, p. 5). Levelling every men as equal is a basic principle of non-discrimination set out in Article 2 & 3 of the Universal Declaration of Human Rights (UN, 1948).

Social justice was first defined in the context of justice where individuals exercising their objective role in society and receive the benefit of their actions (Delgado et al., 2015). This system of social justice was carried out in most western countries. In the United States of America, social justice was defined in the context of diversity and equity. Atweh (2007) states that since justice, equity and equality have different levels of importance and interpretation, equity was sometimes conceptualised as judging whether a certain action of an individual or the state was just. Thus, we find equity imbedding justice and equality. The broader definition of equity however is an equal opportunity, a conceptual definition that falls in line with the Theory of Justice and the Utilitarian approach of social justice. According to Delgado et al. (2015), social justice is general justice whereas Gottlieb and Fisher(1996) refereed to it as community justice. However, the central theme of social justice is justice that serves a collective of peoples. In this context, social justice has been applied in different social disciplines such as social works (McMillin, 2018), social justice in the environment, social justice in and access to education as well as social justice and food security and food justice(Delgado et al., 2015; Gottlieb and Fisher, 1996; Reisch, 2002; Renton, 2003).

4.4.3 Social Justice in South Africa

South Africa's social justice system has been largely shaped by its history. Apartheid plunged many black South Africans into destitution. It is not surprising that in the early 1960s, the social justice agenda in South Africa was defined in terms of giving freedom to black South Africans.

A social system based on human rights takes into consideration three main issues; the right holders; duty-bearers and a system of accountability (Kent, 2010). As will be seen later in the chapter, these three structures are vital elements in addressing food choices, food access, and food availability

for any population. Kent (2010) states that the right to adequate food is linked to the right to dignity of all persons thus showing that it is practically impossible to isolate human right to food and dignity from its social justice context. The paradox however is that food is a private good that is also commoditized and thus has the potential of making access complex (May, 2017). It is this complexity in the food industry that makes it challenging for the government, civil society, and other stakeholders, with their counterparts in a neoliberal economic system to fail to come to a compromise between human needs and the drive for profit.

4.4.4 Critics of social justice

One of the greatest opponents of social justice was Friedrich Hayek who points out that social justice was a meaningless term. In trying to provide substance to the term, Hayek states that social justice is either virtue of it is not (Novak, 2000b). Social justice has been defined by many authors to ascribe virtue to which in most cases is interpreted as something that an individual possesses. However, most descriptions of the moral virtue of social justice seem to resonate around the impersonal state of affairs unemployment, inequality, and in the case of South Africa, access to land, a living wage, or access to resources that could improve the living conditions of the majority of South Africans. When properly describe, Novak, (2000) argue that Hayek's point of departure of the concept is that it should be properly ascribed to individuals for it to be a virtue. However, since many attribute social justice as the role of the governing authority, the king, or any institution vested with such moral obligation, then virtue is exchanged for power (Novak, 2000b). Miller (1991) complements Hayek's principle of state and virtue when asserts that societies can be virtuous. Novak (2000) argues that the usage of the virtuousness of societies could only be possible if there exists such power as vested on a king or a chief.

Given the institutionalisation of fundamental human rights, the right to food and nutrition is enshrined in International Law and adopted into the South African Constitution. Albeit human right in Africa is dominated by other forms of rights (Shivji, 1989) the right to food is a basic

human right in its own writ. The rationale being that, the custodians of human rights – United Nations, hold that every human right is interrelated yet independent and indivisible. A violation of the right to food and adequate food may likely impair the right to health, education, and ultimately the right to life (United Nations Human Rights 2010). In this regard, it becomes paramount to address the obesity problem from a right-based perspective and from the premise of the principle of justice to the poor.

The right to food at all times, as promoted by the Universal Declaration of Human Rights is the liberty and freedom to access available food at all times. In the view of this research, such liberty in terms of food access is made possible through policies and programs that ensure that the most vulnerable in society are not deprived of quality food and nutrition at all times. The right to food compared to other human rights is highly underreported (McLaren, 2014). In addition, media reporting on the right to food is skewed and does not look at the problem of food and food access holistically. Despite reports on the increase in obesity in South Africa(Armstrong et al., 2006b; Dinbabo et al., 2017; Pienaar, 2015), there is yet to be a comprehensive piece of legislation that addresses food and nutrition-related weight gain problems in South Africa. This highly contested terrene in academic, social, and political discussions is highly compromised in South Africa.

4.5 The legislative framework for addressing overweight and obesity

This section attempts to highlight the need for a legislative framework and policies that will pave the way to fight the scourge of hunger, obesity and malnutrition affecting millions of South Africans, the majority of whom are children, the unemployed, and the aged. Human dignity is a function of one's ability to access employment opportunities, quality of food at all times. Developing a right-based approach in South Africa must necessarily go beyond the constitutional

declaration. The Universal Declaration of Human Rights (UDHR) provides generally that everyone has the right to life (UN, 1948).[4]

Over 795 million people in the world have been diagnosed to be undernourished and malnourished due to the lack of basic micronutrients associated with around 3.1 million annual deaths globally of children younger than five years (McGuire, 2015). The Right to Food is a basic human right that is enshrined in International Law and adopted into the South African Constitution. However, little attention is given to the right to food. Rather, Human right in South Africa is dominated by other forms of rights -Gender-Based Violence, Child education and Child Protection, and so on. In addition, media reporting on the right to food is skewed and does not look at the problem of food and food access holistically. Despite reports on the increase in obesity in South Africa, there is yet to be a comprehensive piece of legislation that addresses the weight gain and food problem in South Africa. This highly contested terrene in academic, social, and politically discusses is yet to receive optimal attention in South Africa. There is need for a strong and effective legislative framework that will ensure the prevention and protection from obesity amongst adults and children.

4.5.1 The rule of law and not the role of law in obesity prevention

"It is better for the law to rule than one of the citizens so even the guardians of the laws are obeying the laws"(Book III, s 1287, cited in Scalia 1989). The premise of the above statement stems from the fact that if the law rules; none will be above the law in society including the guardians of the law. The application of this principle in the context of obesity prevention is likely to create a national benchmark for its application. However, this may not take place without contestations in a democratic South Africa. Thus, given the fragility of the context, it is imperative to ensure that

[4] Section 3 of the UN UDHR 1948

greater depths of understanding be given and all the "clouds" if possible are cleared for a detailed framework to ensue.

Finding an appropriate context and concepts to personalise any legal principle or piece of legislation has never been more daunting than in the context of obesity (Casey and Niblett, 2019). Scalia (1989) attempted to provide a contrast in the contextualization within the very contentious nuances between the "general rule of law" and personalisation. It is incumbent of the law to provide a general rule while judges are called to deal with case-specific attributes of the law which where latent or may have appeared opaque at the time of legislation.

Given that judicial decisions are based on facts, the general rule of law is that the facts provide the bases for the decision regardless of whether such a decision will affect the general public or part of it. Several factual shreds of evidence have emerged both at the national level and community levels, pointing to the effects of obesity on the population of South Africa. Yet limited action is given to address the current obesity and nutritional crises especially amongst the poor. In common law jurisdiction, the judgments of higher courts provide a framework for the interpretation of similar cases in lower courts (Scalia, 1989). In the present context, it can be difficult to sue a particular company for fat content or high sugar beverages in South Africa. No rule of law exists as deterrence, holding both government, legal entities and citizens legally liable for their increase in weight.

> "A lot has been written about the rule of law, particularly over the past 20 years, and it has not made the term clearer. Like democracy and other important public values, what precisely is meant by the term is deeply, perhaps essentially, contested. And yet, though I do not want to engage in a disquisition on the rule of law here. I think it is fairly uncontroversial that, whatever else one wants to say about it, one of the central antitheses to the rule of law is arbitrary exercise of power. That is what the rule of law is supposed, perhaps not solely but perhaps above all, to guard us against [overweight and obesity-my emphases]" (Kraygier, 2014. P.86).

Martin Kraygier defines the rule of law as within the context of polity, stating that the rule of law is an institutional accomplishment has established values for the general public. Emanating from the rule of law is economic development, human rights values, and political systems such as democracy (Kraygier, 2014). The United Nations Secretary-General in 2004 stated that the rule of law is a set of principles of governance that binds all persons, institutions and entities whether private or public as well as the state to be accountable to laws put in place which are in line with international human rights norms and standards (Ellis, 2010; United Nation, 2004). Bester (2017) states that the rule of law is those principles that govern society and which must be adhered to by all to ensure the wellbeing of society. However, the threats on the rule of law in South Africa raises questions as to the country's commitment to the rule of law. The point here is that South Africa is undergoing threats in the independence of the judiciary and that any rule of law, no matter how good it may look like is subject to being challenged at the constitution court. It is important to state upfront that these challenges within the South African legal system before making any recommendation of the existing system.

4.5.2 Children Right Approach

The government of South African through its constitution has adopted international law on food and nutrition as an attempt to redress the legislative gap in the food sector. Though the constitution provides for the right to food and nutrition generally, adding the right to food for children was a landmark victory in a constitutional democracy in South Africa. However, despite the relevance of children's right to food as propounded by the constitution, it remains one of the areas in social science and in law that is still underdeveloped both internationally and in South Africa in particular (Chirwa, 2009; Doek, 2019; Sloth-Nielsen, 2016)[5].

[5] "Both the United Nations (UN) Committee on Economic, Social and Cultural Rights (CESCR), which monitors the implementation of the International Covenant on Economic, Social and Cultural Rights (ICESCR), and the UN Committee on the Rights of the Child (CRC Committee),

Children's right in South Africa has largely focused on child protection, the right to education, the right to health and access to health care services, housing, water, and social security. The government has been commended for her huge spending on social support for vulnerable children as a safety net against child poverty (Dinbabo, 2011a). However, there is numerous empirical evidence that suggests that the Child Support Grant in South Africa is rather a family grant and not necessarily targeting children (Belebema, 2015; Dinbabo, 2011; Hall, 2010; Lund, 2011). Further evidence has shown that CSG is a multipurpose income that addresses household poverty, child education, and food security for the children (Belebema,2015). Greater depth to children's right to food and the right to health is discussed in chapter nine.

4.6 International law and the right to food

International human right law is a fundamental international instrument that obliges that nations and member countries comply with the principles set to protect the rights and dignity of all in the world regardless of their race, nationality. In this regard, the right to food first started to gain momentum at the creation of the Food and Agricultural Organisation (FAO) in 1945. As already stated in Chapter 2 above, one of the objectives of the FAO was to seek to address the problem of hunger and malnutrition worldwide. This objective is spelled out in the preamble of the FAO Constitution of the FAO, to ensure that members commit to provide citizens and noncitizens an acceptable standard of living, ensure the continuous production and distribution of food in an improved and deficient manner while making it accessible to all to achieve universal freedom from hunger for all.

Everyone has the right to food and nutrition. According to the Universal Declaration of Human Rights (UDHR) 1948, the UN Charter provides to the recognition of human and people's right to better living conditions, the right to health and health care services, clothing, food, and social

which monitors the implementation of the Convention on the Rights of the Child (CRC), have paid little attention, if any, to this aspect of the right to food." (Chirwa, 2009, p.1)

services. However, the right to food was given very little attention as a right on its own vein until 1996 when the International Covenant on Economic, Social, and Cultural Rights (ICESCR) was adopted[6].

The ICESCR recognizes the right to food with greater emphasis to freedom from hunger and malnutrition. Albeit this extension of the right to food from the UDHR, the right to food and nutrition has largely focused evidence on child stunting which emerges largely from hunger malnutrition. The right to food and nutrition has failed to address the issue of obesity as critical evidence of nutritional inadequacy[7]. The Rome Declaration of 1996 at the World Food Security Summit reaffirmed the right of all peoples to access to safe and nutritious food, in line with the fundamental right to adequate food.

Table 4-3 Agreements on Food Security Sin 1943

International Agreements on Food Security Sin 1943	
Convention/ Treaty	Description
1943: UN Conference on Food and Agriculture	The United Nations Conference on Food and Agriculture was held from 18 May to 3 June in Hot Springs, Virgina (USA), with the participation of 44 governments. Convened by US President Roosevelt, the Conference decided on the establishment of a permanent organization in the field of food and agriculture.
1945: Food and Agriculture Organization of the United Nations (FAO) is established	The first session of the FAO Conference met in Quebec City, Canada, establishing the FAO as a specialized agency of the United Nations.
1961: World Food Programme is established - A/RES/1714(XVI)	WFP was initially established in 1961 as a multilateral food aid programme with the support of the UN General Assembly resolution: A/RES/1714(XVI)
1974: First World Food Conference	The first World Food Conference was held in Rome on 5-16 November 1974, where governments examined the global problem of food production and consumption.
1979: Plan of Action on World Food Security	The FAO Committee on World Food Security adopted the Plan of Action on World Food Security at its 4th session, Rome, 5-11 April 1979.

[6] Discuss the right to food under the ICESC of the Child separate

[7] This has been discussed in detail in chapter 8 &9

1981: World Food Day established - A/RES/35/70	By adopting GA resolution, A/RES/35/70, the UN welcomes the observance of World Food Day annually on the 16th of October.
1992: First International Conference on Nutrition - World declaration and plan of action for nutrition	In December 1992, the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) organised the first International Conference on Nutrition, in Rome, Italy.
1996: World Food Summit - Rome Declaration on World Food Security and World Food Summit Plan of Action	World leaders assembled in Rome in November 1996 for the World Food Summit. The FAO called the Summit in response to widespread undernutrition and sought to renew the global commitment to the fight against hunger.
2000: UN Millennium Declaration	The Declaration was a new global partnership to reduce extreme poverty and hunger and came to be known as the Millenium Development Goals (MDG). Goal 1 includes a commitment to halve the proportion of people who suffer from hunger by 2015.
2002: World Food Summit +5	The World Food Summit: five years later held on 10-13 June 2002 reaffirmed pledges to end hunger. The outcome document is: "Declaration of the World Food Summit: five years later.
• **2008: UN Secretary General High Level Task Force on Global Food and Nutrition Security (HLTF)**	The HLTF was established by UN Secretary-General Ban Ki-moon in 2008. The Task Force is chaired by the UN Secretary-General and the FAO Director-General is Vice-Chair.
• **2009: Rome Declaration on World Food Security**	World leaders unanimously adopted a declaration pledging renewed commitment to eradicate hunger from the face of the earth during the World Summit on Food Security.
• **2012: RIO+20 - Zero Hunger Challenge**	The Zero Hunger Challenge, an initiative by the UN Secretary-General, invites all countries to work for a future where every individual has access to adequate nutrition and resilient food systems.
• **2012: Food Assistance Convention**	The Food Assistance Convention, an international treaty, was adopted on 25 April 2012 in London. The treaty aims at "addressing the food and nutritional needs of the most vulnerable populations".
• **2014: Second International Conference on Nutrition**	The Second International Conference on Nutrition was held in Rome, Italy in November 2014 and adopted the Rome Declaration on Nutrition, committing countries to eradicate hunger and prevent all forms of malnutrition worldwide.
• **2015: Milan Declaration on Enhancing Food Security and Climate Adaptation in Small Island Developing States**	The Meeting addressed food security and nutrition from multiple angles: the importance of promoting sustainable approaches to agriculture and fisheries and building resilience to climate change and disasters; the benefits of improving rural livelihoods of smallholders and family farmers.
• **2015 : United Nations Sustainable Development Summit : Goal 2**	The UN summit for the adoption of the post-2015 development agenda, a high-level plenary meeting of the General Assembly, was held from 25 to 27 September 2015 in New York. Sustainable Development Goal 2 aims to end hunger and all forms of malnutrition by 2030.

2016: High-level side event on pathways to Zero Hunger	During the high-level side event to the 71st UN General Assembly, conversations about achieving Zero Hunger and the Sustainable Development Goals by 2030 were held.

Source: Author's compilations from cited works[8]

4.6.1 The African Charter on Human and Peoples Rights

The African Charter is one of the major legal milestones in Africa that seeks to drive the protection of human rights in the continent. The African Charter promotes the rights of the child but failed to address the right to food and nutrition as a basic right of the child. The charter does not in any way mention the word food or hunger despite massive evidence of hunger and malnutrition in Africa for several decades. Chirwa, (2009) however states that the right to food is recognised in the charter when the right to life and health are read together. According to the African Charter on the Rights and Welfare of the Child (ACRWC) 1990 also referred to as the African Children's Charter, children have the right to be protected from malnutrition as a measure to achieve the best interest of the child in terms of child health and wellbeing and to ensure the physical and spiritual development of the child. Given that the right to health cannot be attainable without the right to adequate nutrition, it was necessary therefore for international policymakers to view the right to food as an independent and separate right of its own.

4.7 The Right to Food in South Africa

The National Development Plan (NDP) of South Africa outlines the health goals of the country. The NDP envisages "A long and healthy life for all South Africans," by 2030. To achieve this objective the NDP sets out the following Blue Prints for the country's health outcomes by 2030:

[8] Source: https://research.un.org/en/foodsecurity< Date accessed: 19th August 2019>

- Eliminate income poverty – Reduce the proportion of households with a monthly income below R419 per from 39 percent to zero.
- Reduce inequality – The Gini coefficient should fall from 0.69 to 0.6.
- Reduce infant mortality rate by less than 20 deaths per 1000live births
- Improve the life expectancy rate to 70 years for both men and women
- Ensure affordable access to quality health care while promoting wellbeing NDP 2012).
- Haven outline the health vision for South Africa, the National
- Realise a food trade surplus, with one-third produced by small-scale farmers or households.
- Ensure household food and nutrition security. (NDP, 2012)

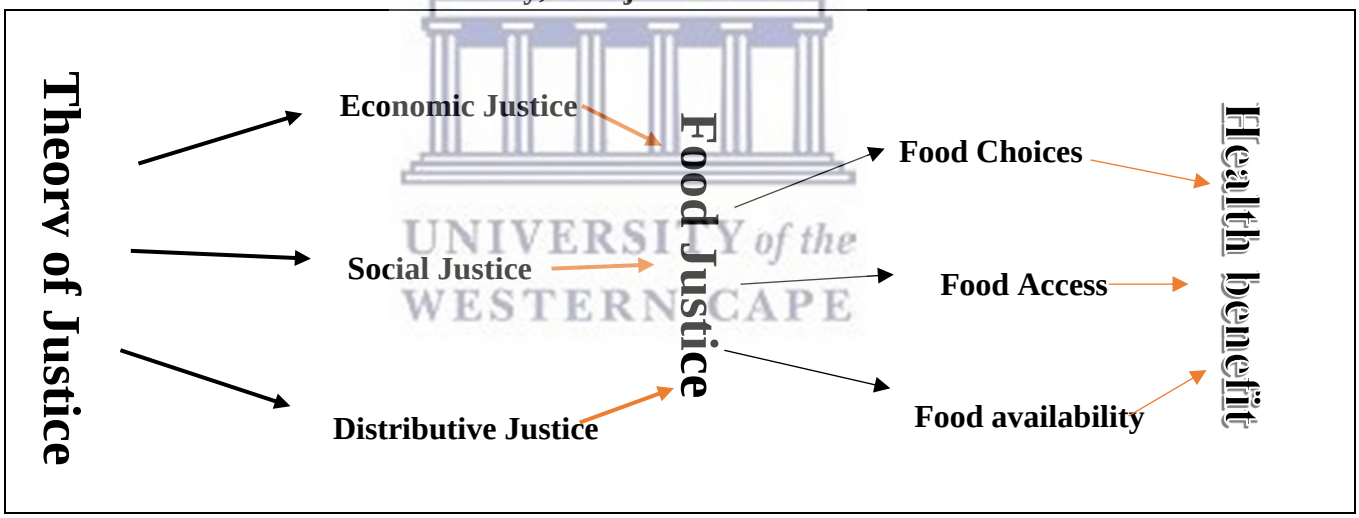
The above ambition of government is to a large extent proposal to address problems not solutions to the existing problems. Overweight and obesity have been recorded in South Africa for decades as a health risk factor. Yet policies that aim at addressing the weight gain problem are rare and when they exist, they are compromised. The NDP is largely dependent on the Executive arm of the government to seek appropriate solutions to the health and social problems of the wider public. According to Section 8(1) of the Bill of Rights all organs of the state -the legislature, the executive, the judiciary are bound to ensure the effective implementation of the Bill of Rights in South Africa (RSA, 1996). The Bill of Rights provides for the fundamental rights of all who live and work in South Africa which is inclusive of the right to health and health care, the right to food and nutrition, yet many poor South Africans can't access basic food and nutrition.

The human right has continued to evolve since it was first established in the mid-1940s. The right to food and the right to adequate nutrition is now recognised under international human rights law and seeks to provide for all people to attain greater access to adequate food and nutrition. Though the right to food seemed to be entrenched in international human rights law in association to the right to life and dignity, these rights can exist independently because what threatens life in one country may not necessarily relate to food access and food availability.

The debate around food security, food access, and the fight against global hunger and malnutrition has been ongoing for over 70years since the 1943 UN Conference on Food and Agriculture was

held. After 70 years, it is but obvious to state that the international community is still grappling with overcoming hunger and malnutrition worldwide. There is no international law on food security. Chirwa, (2009) argue that food access, availability, and adequacy, have merely been submerged under the broad concept of health, wellbeing, and better living standards under the UDHR. The right to food must be given an equivalent weight in international discussions on food and nutrition with radical commitment to address the food and nutrition problem. The right to food in South Africa is stated in Section 27(1)(b) and section 28(1)(c) of the Constitution of South Africa. These two provisions of the law are binding on the South African government and South African people generally to ensure that everyone can have sufficient food at all times as well as being able to produce their own food where appropriately. Many have alluded to the fact that despite the provision of Section 27(2) of the constitution, section

Table 4-4 Interactions between theory, food justice and health



Source: Author's hypothetical model

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The above ambitions of government are to a large extent proposal to address problems not solutions to the existing problems. Overweight and obesity have been recorded in South Africa for decades as a health risk factor. Yet policies that aim at addressing the weight gain problem are rare and when they exist, they are compromised. The NDP is largely dependent on the Executive arm of the government to seek appropriate solutions to the health and social problems of the wider public. According to Section 8(1) of the Bill of Rights all organs of the state -the legislature, the executive, the judiciary are bound to ensure the effective implementation of the Bill of Rights in South Africa (RSA, 1996). The Bill of Rights provides for the fundamental rights of all who live and work in South Africa which is inclusive of the right to health and health care. The right to access to food and nutrition etc.

Given the social dynamics of the obesity problems in South Africa, there is no centralised system that focuses on addressing the obesity crisis. Albeit such a system may be difficult to establish, the reasons are based on the diversification and interrelatedness of the factors associated with overweight and obesity. For example, the Department of Social Development is the custodian of social protection in South Africa (Dinbabo, 2011; Dinbabo, et al., 2017). There is a need for efficiency in service delivery to address the problem of multiple vulnerabilities in South African society. This is one of the major reasons why malnutrition persists in South Africa Devereux & Waidler, (2017). The DSD is charged with social protection such as Social Grants schemes- the

Child Support Grant (CSG) under its constitutional mandate as provided by Section 27(1). However, concerning the best Interest of the Child Policy, the main focus of the DSD is grant allocation and ensuring that children are under the protection of a caregiver. The Department of health focus on child health. There is no legislative framework for the prevention of childhood obesity in South Africa.

4.8 Conclusion

This chapter has discussed situates the current study within the framework of the Theory of Justice, the Social-Ecological Model and the Social Comparison Theory. First, it looked at the Social-Ecological Model giving the example of Bronfenbrenner's Social-Ecological model.

Human dignity in food choices is a function of once ability and opportunity to access quality food at all times (Section 25 of UDHR). Developing a rights-based approach to overcome overweight and obesity necessitates a framework that goes beyond the constitutional declarations. Incorporating Rawls' Theory of Justice in Social Comparison Theory and the Social Ecological Model helps to explain the prevalence of obesity amongst adults and children living in urban peripheral townships in Cape Town. The Theory of Justice is one of the fundamental theories that seeks the protection of Human rights and to preserve human dignity. Human dignity was the main objective of Article 1 of the UN declaration of human rights and freedom: "All human beings *are* born free and equal in dignity and rights (UN, 1948). The absence of a strong legislative framework in South Africa that focuses on obesity prevention.

Khayelitsha and Mitchells Plain are the remnants of injustice in the apartheid era that continue to impact the health and welfare of the population. Adults and children are exposed to poverty and inequality and an unhealthy food environment. Poverty remains the mainstay of the population given its apartheid history and current socio-economic situation. The next chapter provides the methodological approach to the study. It is important to note at this juncture that this study forms part of the output of the Project to Support Pro-poor Policy Development in South Africa. Thus,

the two study areas, Khayelitsha and Mitchells Plain were selected based on their historical, and socioeconomic circumstances since after 1994.

Chapter 5

RESEARCH DESIGN AND METHODOLOGY

5.1 Introduction

This chapter provides a description of the research design and methodology used to achieve the research objectives outline in chapter one. But more so the chapter outlines the methodological issues that inform the data analysis chapters 6, 7 & 8. It includes a description of the general research processes of questionnaire design, field data collection, and data analysis processes. The techniques applied in the data analysis and some of the limitations of the collected data. This study is part of the Programme to Support Pro-poor Policy Development (PSPPD) project that was conducted in 2016/2017. The study used a mixed-methods research methodology. The PSPPD project for which this research is one of the outputs drew data from two sources. First, haven applied a mixed-method approach, quantitative and qualitative empirical data was drawn from Khayelitsha and Mitchells Plain, and second, secondary quantitative data was drawn from the National Income Dynamics Study. The NIDS data is a nationally representative sample.

However, for purposes of this thesis, I have focused on the quantitative approach of the survey but where applicable, buttress some of the findings with the qualitative data. The rationale for this was that since the project had already dwelled on an in-depth analysis of the NIDS data, it was immaterial to carry out such repetition in the thesis. Furthermore, the survey data had not been sufficiently analysed scientifically to draw inferences from the population of the study area. In addition, other aspects of the study included the use of the national income dynamic study dataset for national comparison. It was necessary therefore to focus on the empirical data to advance even more robust analysis on the phenomenon of overweight obesity Khayelitsha and Mitchells Plain.

5.2 Research design

A research design is used to guide the research process (Mouton, 2001). Since the research design is a roadmap or a blueprint towards the research process, it is therefore critical to carefully ensure the accuracy of the research design and its implication on the outcomes, effects, and validity of the research results. A typical research design outlines the research methodology, the types of variables, data collection instruments, data analysis techniques used to achieve the research results. objectives (Babbie, 2013). According to Neuman (2000), a research design may include case study, action research, experiment, grounded theory ethnographic, and surveys, just a name a few. According to (Vaus, 2001) a research design goes beyond just a work plan for the research. A research design seeks to ensure that the evidence of the research outputs is unambiguous. It addresses a logical problem and not a logistical one.

Research design and research methods are sometimes used as if they are synonyms. However, this is not the case. There is a clear difference between the concepts. This terminological mismatch is sometimes reflected in the misuse of research design as a research data collection strategy (Vause, 2001). Data collection method cannot be equated to a form of research design which makes the process of collecting data to be immaterial in the logic of the design.

5.2.1 Research methods

Research methodology is defined as a theory of a research process (Heyvaert et al., 2013; Schwandt, 2007; Yvonne Feilzer, 2010; Schwardt 2007). It states how particular research ought to be conducted is what often referred to as the research methodology is. Such processes may include an analysis of assumptions, procedures, and principles in the course of the inquiry. In the Dictionary of Qualitative Research, defines research methodology as a theory of how an inquiry should proceed. It involves an analysis of the assumptions, principles, and procedures in a particular approach to inquiry.

Research in social science is traditionally distinguished by two research cultures or paradigms. Some studies (Babbie, 2013; Sommer Harrits, 2011), have noted that these paradigms follow two typologies, quantitative and qualitative research methods. In qualitative research, qualified information or data is obtained and analysed through inductive reasoning, while the quantitative paradigm emphasises on numerical quantitative data collected and analysed through deductive reasoning (Babbie, 2013).

Given the difference in their research processes, their philosophical assumptions, epistemologies, and ontological backgrounds, disputes between the two research approaches have often met with strong arguments. Understanding these philosophical assumptions and difference is vital in any research process such that a research design must clearly state the research method of the research and procedures that are suitable for the research to generate credible knowledge (Sommer Harrits, 2011). Paley (2000) argues that the difference between a qualitative and quantitative approach comes close to being incoherent and is mere extreme relativism. Also, the two research approaches are simple tools in doing research.

When quantitative and qualitative methods are applied in research (Paley, 2000) states that they should be seen as tools, whether such research uses maps, interviews, questionnaire, focus group discussion, these must be conceptualised as instruments in the hands of the researcher despite their philosophical ideologies and presupposition within them. The mixed-method research approach emerges not as an independent research approach but sort to fill the gaps created during the application of the extremist paradigms (Yvonne Feilzer, 2010). The mixed-method research approach is continuously gaining momentum in social science research nowadays (Creswell & Clark 2007). The purpose or the motivations for researchers adopting the mixed method approach is to ensure the maximum benefit of the two research approaches while minimising weakness and errors. The PSPPD project adopted the mixed method approach and obtained detailed qualitative and quantitative data from the study area.

5.2.2 Quantitative data collection methods

Empirical data was drawn from Khayelitsha and Mitchells Plain in 2016/2017. The data collection method involves the collection of household data as well as individual data. Primary data collection sources comprised mainly of household surveys in Khayelitsha and Mitchells Plain as well as anthropometric measurements. Babbie (2013) states that quantitative research method is grounded on the effective use of numerical quantitative data that is analysed scientifically using statistical instruments. This is a key departure between qualitative and quantitative methodologies. This positivist approach to knowledge is informed by the belief that just as scientific observations are carried out in national sciences, social sciences need to apply similar robust laboratory procedures in a social context thus ensuring that units of analysis such as population or sample of a population tested and generalisation made.

According to (Babbie, 2013) quantitative research method places emphasis on the use of quantitative numeric data that can be analysed statically. Muijs (2010) states that quantitative research method explains a phenomenon by analysing numerical data using mathematical tools such as software (SPSS & STATA) (Muijd, 2010). Quantitative research is characterised with descriptive analysis, correlational, causal-comparative research and experimental analysis. It collects numerical data to explain, predict, and or the control of a phenomenon of interest (Babbie, 2013; Packer, 2011).

Thus, there are two elements paramount to quantitative research; that is, there must be a phenomenon or knowledge claim that the researcher seeks to know. These researches test such phenomena. For example, the research tests the phenomenon that CSG creates other social dysfunctions such as family disintegration. It uses social capital and the hypothesis that people living in poor households or who are low-income earners, tend to have poor social capital associations than high-income earners. Secondly, quantitative research deals with quantity and thus asks such questions as –how many, what percentage, etc. However, though quantitative

research focuses more on numerical mathematical analysis of a phenomenon it does not reject the fact that quantitative research does also analyse non-numerical data (Muijs, 2010).

5.2.3 Self-administered household questionnaires

In designing the PSPPD questionnaire, the research team aimed at obtaining a representative sample from the population. In that regard, 1200 households. A total of 532 households were interviewed in Khayelitsha and 519 from Mitchells Plain through systematic random sampling which amounted to 1052 (87.5%) households effectively sampled. Structured questionnaires were distributed to randomly selected households in the study area. As already stated in the introductory chapter of this thesis, the survey targeted children 5 to 11 and adults 18 and above (persons eighteen years and above). Despite this age limits to the survey, people such as teenagers over 11 years were also measured but not as a matter of priority for the researcher. A Household questionnaire was used to capture information about specific household characteristics, household profiles, employment, and income sources, and food consumption and sources using 24-hour dietary recall. Also, information on respondents' eating habits, weight management practices, the perception of health status, and perceptions of obesity was captured. Besides, specific information about children's access to food, water, and questions that test children's socio-economic rights at school and home.

Anthropometric measures include weight and height measured in kilograms and centimetres respectively. The weight was captured using scales used for collecting anthropometric data for NIDS by SALDRU. The height measurements were taken using instruments obtained from UWC's Department of Public Health anthropometric instruments. In addition, a body image chart was used to measure perceived body size of adult and children and these were correlated with actual BMI of the respondents.

A 24hours dietary recall method was implored to assess the level of dietary diversity and well as to identify the food types consumed by the population. The application of 24-hour individual

dietary recall has been widely used and is generally acceptable in determining nutrients intake (Steyn and Labadarios, 2000). It is easy to administer compared to other dietary assessment methods (Nelson and Bingham, 1997 cited in Steyn and Labadarios, 2000). However, some studies have criticised the use of 24hour recall for its lack of reliability in determining nutritional intake (Archer et al., 2018), Krantzler (1982) compared the validity of 24hours recalls and found that recalls that were 3days to 6hrs were 75% accurate whereas Scott et al. (2007) found internal validity with 24hours recall, the author concluded that larger sample size could produce an even greater result. But generally, most research finds that multiple 24hours recalls is likely to improve results validity than a 24hrs recall. For children in particular Eck et al. (1989) used consensus recall which involved in a 24hour recall, the reporting of children's dietary intake by parents and children. This approach was applied in this survey as we interviewed children on their dietary intake while asking mothers and fathers to report the child food intake in the 24hour recall and in the daily lunch boxes as the children to school.

Several considerations were made during the designing of the questionnaire. The PSPPD projected adopted and modified various data collection instruments in South Africa. These instruments include National Income Dynamics Study (NIDS) Wave 3 House Hold Questionnaire; Medical Research Council/Departments of Health and Education 'Youth Risk Behaviour Survey' (YRBS) Questionnaire; Demographic and Health Survey (DHS) Questionnaire; World Health Organization's Global Physical Activity Questionnaire (GPAQ) - Analysis Guide; DANA-FARBER Cancer Institute's Eating Habits Questionnaire; and the World Food Programme's Comprehensive Food Security and Vulnerability Analysis House-Hold questionnaire. Additionally, expert views outside of the core research team were sought from the UWC's Department of Public Health, Southern Africa Labour - Development Research Unit (SALDRU), and Research ICT Africa (RIA). Below is the description of the various section of the survey

5.3 Data collection process

When undertaking a survey, doing a pilot test of the questionnaire is very critical to minimise the chances of error at the onset of the research. Hassan et al. (2006) defined piloting study as a research protocol that aims that testing data collection instruments, as well as other research techniques before carrying out the larger survey. Piloting also helps in validating the questionnaire. During the PSPPD projecting, the household data collection instrument was piloted in two stages. In stage one, 6 of the desktop pilot was used by research team members administering the questionnaire to each other and identifying gaps.

In stage two involved piloting the refined desktop questionnaire. This second step of piloting took place to Westridge, Mitchells Plain, one of the Enumeration Areas selected for the study. A total of 29 households of which were 50 household members making up 2.5% of the proposed sample size of the 1200 households. The piloting test respondent comprehension, sampling procedure, coding, and task of field enumerators, task performance, and questionnaire formatting.

5.3.1 Recruitment of enumerators

Enumerators were recruited to carry out the data collection process. Masters students from the University of the Western were recruited based on their knowledge and experience in data collection in social sciences research. Also, non-university students in the community with postgraduate degrees and community members with experience in data collection recommended other research units were recruited for the enumeration process. All enumerators were specially trained to use the anthropometric instruments for measuring height and weight.

In all, 19 enumerators and 6 supervisors -doctoral fellows at the Institute for Social Development, were recruited for data collection in Khayelitsha and Mitchells Plain. Approximately 75% of the recruits were residents in Khayelitsha and Mitchells Plain while the remaining 25% were student recruits from the Institute for Social Development (ISD), at UWC. Training workshops were

organised to brief these recruits on the project and the household questionnaire as well as to capacitate them with the necessary data collection skills. Methods and techniques used included a presentation, group discussion, mock interviews (role-play), and feedback session. Other aids included presentation slides, enumerator manual, and flip charts.

5.3.2 Sampling procedure

Babbie and Mouton (2010) define sampling as a process of selecting observations from which inferences are drawn about a population. In this study, a two-stage cluster sampling technique was applied. In the first stage, households were selected from Enumeration Areas using Probability Proportionate to Size (PPS). Generally, in PPS, a larger population has a higher probability of being selected. However, though the probability of being selected is high for a large population, smaller populations still have an equal probability of being selected in the sampling process(Czaja, 2014; Rosén, 1997). In the second stage, there was the actual selection of households to undertake the survey. Cluster sampling was chosen because the study area was too large geographically and the lack of a list of households in Khayelitsha and Mitchells Plain compelled the researcher to use cluster sampling over systematic random sampling. Moreso, previous surveys such as the Khayelitsha/Mitchells Plain 2000 Survey utilised a similar sampling method (Crankshaw et al., 2001).

5.3.3 Stage 1: Selection of clusters

The study made use of the Statistics South African sampling frame in the first stage of the sampling process. In PPS, “a sample frame in which the sampling units are organised into clusters” is required (Crankshaw et al., 2001, p.157). For purposes of this research, the study made use of the Stats SA 2011 sampling frame in selecting clusters or enumeration areas (EAs). Twenty-five EAs were selected from Khayelitsha and 25 EAs from Mitchells Plain.

The 25 EAs were selected randomly using probability proportion to size (see Table 6). The use of the PPS methodology was to ensure that each household in the population of interest, whether from a large or small EA, has an approximately equal probability of selection.

Figure 5-1 Enumeration Area map

Figure 5-2 Enumerator Areas selected for Khayelitsha & Mitchells Plain

Khayelitsha			Mitchells Plain		
EA	**Sub-place name**	**N=**	**EA**	**Sub-place name**	**N=**
1990239	Village V3 North	134	1994753	Bay View	284
1990609	Khayelitsha SP	157	1993835	Beacon Valley1	152
1990833	Khayelitsha T3-V2	194	1994448	Beacon Valley2	177
1991004	Khayelitsha T2-V2b	200	1993540	Eastridge	167
1991258	Mandela Park	112	1994525	Eastridge	190
1991469	Silver Town	239	1995329	Eastridge	575

1991945	Ikwezi Park	117	1993357	Lentegeur1	146
1991985	Village V1 South	168	1994008	Lentegeur2	196
1992091	Village V3 North	157	1994521	Lentegeur3	200
1992566	Monwabisi	270	1992282	Mandalay	175
1992621	Bongani TR Section	228	1992691	Portland	160
1992808	Town 3	254	1993451	Portland	170
1992827	Victoria Mxenge	178	1992861	Rocklands	168
1993062	Khayelitsha T3-V3	195	1993970	Rocklands	181
1993216	Village V2 North	186	1994577	Rocklands	209
1993381	Village V4 North	229	1993287	Strandfontein V.	193
1993429	Khayelitsha T3-V2	395	1994302	Tafelsig1	184
1993545	Khayelitsha T2-V2b	301	1994627	Tafelsig2	196
1993693	Khayelitsha T3-V5	206	1994909	Tafelsig3	234
1993717	Khayelitsha T3-V3	345	1995088	Tafelsig4	211
1993806	Village V1 North	184	1992410	Weltevreden	159
1993808	Village V3 North	181	1991999	Westridge1	155
1993897	Harare/Holimisa	214	1993388	Westridge2	169
1994125	Ikwezi Park	245	1993378	Woodlands 1	197
1995222	Ikwezi Park	368	1994830	Woodlands 2	227

Source: Author's analysis of Census, 2011 - Stats SA Enumeration Areas

5.3.4 Stage 2. Selection of households

After the selection of 25 EAs from each of the case study areas, the next step was the systematic selection of 24 households from each EA or cluster selected in stage 1, thus, putting sample sizes for Khayelitsha and Mitchells Plain at 600 each. Geographic coordinates obtained from Stats SA were used to identify selected EA and secondly in the selection of households. Google maps were used to identify dwelling units where K^{th} house was selected and listed for interview. To ascertain

the Kth house/household for say 1994830 (situated in Ikwezi Park) with 368 households, researchers divided the total number of households (368) by the expected number of households, which is 24 for each selected EA. This gives a K value of 15. Thus, for this particular EA, every 15th household identified was selected for an interview.

Table 5-1 Sample realization

Survey site	Sample size	Sample realized		Refusals
Khayelitsha	600	532	89%	68
Mitchells Plain	600	519	87%	81
Total	1200	1051	88%	149

Source: Author's analysis of empirical data

The expected number of households selected for the survey was 600 Khayelitsha as shown in Table 7 above. The survey yielded 89% response rate for Khayelitsha and 87% for Mitchells Plain. From the 1051 households effectively interviewed, the survey achieved a total of about 4300 sample size or 88% response rate for both study areas. A similar outcome was experienced in the Khayelitsha and Mitchells Plain Survey (Crankshaw et al., 2001).

5.3.5 Variables

Health perceptions of respondents and Observed BMI classification were used to assess the relationship between perception and the reality of health and overweight. Health perception was measured by the question, "how do you perceive your health status to be at present"? This question has five response choices, "excellent; very good, good, fair or poor." On the other hand, Observed BMI which was derived from the NIDs data set was used to measure weight and height variables. This information was classified into three categories based on the WHO classification index. The WHO classifications were used in accordance with the following thresholds: persons with BMI

values between 0-18.49 were coded as “underweight,” persons with BMI values between 18.5 and 24.9 were coded as “normal,” persons with BMI values between 25.0-29.9 were coded as “overweight”. In addition, to analyse problems of obesity in South Africa, a BMI of above 30 was categorised as obese. Other variables were also used to define the sample, including gender (male or female), population group (Black, Coloured, Indian/Asian, White), age (years), annual household income, marital status, amount of money spent on medicine annually, health conditions (blood pressure, heart attack), smoking and satisfaction in life.

5.4 Data Analysis

5.4.1 Data Analysis Structures

Data obtained from the survey were statistically analysed, to describe phenomena as well as identify and examine the associations and correlations of the relationships. STATA Version 14 was used to carry out all analytical procedures. As Kreuter and Valliant (2007) suggest, there are more analytical procedures for survey data in STATA version14.

5.4.2 Diagnosing and measuring obesity

In other to appropriately identify diagnose and quantify the number of people affected by overweight and obesity, a common index is required to classify and differentiate and quantify levels of overweight and obesity in adults and children, its gender and age dynamics and to a greater extent, it's level of homogeneity amongst different population groups. BMI is a measure of weight-for-height and is a calculation of a person's weight in kilograms divided by the square of his height in meters (Kopelman, 2000; WHO, 2015). However, this approach to estimate body fat may differ especially with children and in some cases, some research has adopted the inclusion of waist circumference (Hardy et al., 2017; Nystad et al., 2010; Thandi Puoane et al., 2002a), While others have used a Tri-ponderal measure of weight divided by height3 especially in children and adolescents (Akcan and Bundak, 2019; Moselakgomo and van Staden, 2019).

The traditional of BMI measurement and categorizations commonly used globally is that developed by the WHO and has been applied throughout this study. According to the WHO, (2008) BMI is categorized of >25-29.9 kg/m2 for overweight persons and a BMI of >30 kg/m2 for obese persons. Other methods that complement the BMI scale include the waist-hip ratio which measures abdominal obesity and is seen to be a more accurate measurement than traditional BMI measurement in predicting the risk of myocardial infarction, stroke, and premature death.

The WHO BMI standards were applied in this study. Researchers on BMI have used different methodologies such as weight for age and height for age to estimate body sizes. However, the most commonly accepted standard for measuring BMI, which has been adopted in this research, is the BMI=Weight/Height^2 measurement for an adult. These measures were classified as following using WHO guidelines for BMI cut-offs: Underweight (BMI ≤18.5), Normal Weight (BMI≥18.5 and ≤24.9), Overweight BMI (≥25.0 and ≤29.9), Obese Class 1 (BMI≥30.0 and ≤34.9), Obese Class 2 (BMI≥35.0 and ≤39.9), Obese Class 3 (BMI≥40 (WHO, 2006) (Wang and Chen, 2012). Children BMI was calculated using the WHO weight-for-age standard developed in STATA (Vidmar et al., 2004).

The BMI cut-offs for children was developed to address the questions that were related to differentiations in the height and year of a child. Representative samples from six Brazil, Great Britain, Hong Kong, the Nether-lands, Singapore, and the United States were analysed BMI for children was initially standardised (Vidmar et al., 2004). The Centre for Disease Control (CDC) in the United States conducted the study of children's growth reference using data from 1963 to 1994 (Kuczmarski et al. 2000). Cole (1990) and Cole and Green (1992) contributed to developing the methodology for transforming crude BMI data score into standard deviation z-scores. Vidmar et al. (2004) has imbedded this methodology into STATA to make it easy for data manipulation for categories and characteristics of data BMI datasets such as in table Chart code Description Measurements unit xvar() range.

Chart	Description Measurement	code unit	xvar () range
ha	height-for-age	cm	2 to 20 years
wa	weight-for-age	kg	0 to 20 years
ba	bmi-for-age	kg/m^2	2 to 20 years
hca	head circumference-for-age	cm	0 to 36 months
la	length-for-age c	m	0 to 36.5 months
wh	weight-for-height	kg	77 to 121.5 cm
wl	weight-for-length	Kg	45 to 103.5 cm

Source: Vidmar et al., (2004)

5.4.3 Developing food groups to identify dietary patterns

Dietary Diversity Score (DDS) was used to determine food consumption and to assess whether a person with high DDS is more likely to become obese. We develop 12 food groups based on the 36 food choices reported by participants. Instead of a standardized Food Frequency Questionnaire provides by the FAO which stated 8 food groups, participants were allowed to state what they ate during the 24-hour recall. The rationale was that using the FAO food could have limited the identification of specific food types eaten by respondents since local food contents and composition vary by culture and race. Using an open-ended question, respondents stated the type of food consumed which was considered to be their food choices. The objective was to minimise the chances of not being able to record food types that a pre-prepared list of food types may leave out. We measure the association between the size of the households, the demographics characteristics of the households, the association of DDS, and BMI. We used Principal Component

Analysis (PCA) to develop food patterns and use ordinary least square regression to identify the association between food groups, food patterns, and BMI.

5.5 Application of statistical models

5.5.1 The application of the Rasch Model in Children's Food Choices

All children within the age category were allowed to answer the questions. Not more than 4 children were randomly selected per household. The reference period for all questions was one week. Codes were given to the responses. Binary questions were coded (yes=1, No=0). Other questions with responses of Always/ Sometimes / Never were coded differently. Always/Sometimes=1 and Never=0. The Rasch model was used to analysis the eighteen food types that were self-reported by the parent and by the children. The data was transformed to measure the level of difficulty and easiness in making food choices. The purpose of using the Rasch model was to help triangulate food types from home, lunch box, and food types children buy without parental control. One of the limitations of this study was that due to logistical setbacks, crime, and associated risk in the area, some children could not be interviewed. Children who attended school could only be measured after school or during weekends. Thus, we have parents reporting what children eat at home and what they had in the lunch box but could not interview such children to know what they buy on their own decision.

5.5.2 Item response analysis of food choices

IRT was used to estimate the level of ease at which certain products are consumed by children when allowed to make choices. (Beets et al., 2014) found that children will most likely make wrong food choices if allowed to choose. In a recent study of food consumption outside the home by (Bezerra et al., 2017) teenagers accounted for 37% of people who purchased food outside the home. The study found that fruit was the least purchased even by adults. The most common products purchased were sweets, snack chips, and soft drinks, etc. In this analysis, we compare the

food purchased by children as shown in table 2 above but added a third aspect of children's food sources. One of the questions we asked during the survey was to investigate what parents or caregivers put in the children's lunch box.

We used the Rasch model to analysis the eighteen food types that were self-reported by parents and by the children. Other studies have applied a similar procedure and found that the model has an advantage over classical test theories (Hays et al., 2000; Owino et al., 2014). We estimated the coefficients to assess the level of difficulty and easiness of the parameters. The coefficient of difficulty was grouped in ascending order. Since we assume a zero mean for beta, an item that shows a negative coefficient indicates easiness while an item with a positive coefficient indicates difficulty.

5.6 Ethical considerations

The PSPPD project was commissioned by the European Union and its South African partners. The project base was the University of the Western Cape. The University ensures that research projects carried out within the auspices of the University must comply with the University Ethics Code. Ethical clearance for the PSPPD project was obtained from the Faculty of Economic and Management Sciences (EMS), and from the University's Ethics Committee permitting the execution of the project after the project team had complied with the Ethics Code of the University. The project team ensured the strict adherence of the ethical code of the university by ensuring that no participants involved in the project were injured or their right to participate interrupted in any way.

To comply with the University Ethics Committee regulations, the research team made the following:

- briefed enumerators and all adults' participants on the purpose of the study and on how the collected data would be used.

- All adults respondent were asked to sign a binding consent document to protect them and the researchers. A confidentiality statement was included in the consent form state that "All personal information provided will be kept confidential".

- Parental/ guardian consent was also sought for children participating in the survey.

- Participation in the survey was voluntary and therefore all participants were informed of their right to participate or not to participate. Participants were also free to withdraw from the survey at any time they deem necessary.

- Municipal authorities such as Ward Councillors and community leaders were informed in advance and community members were informed about the project.

5.7 Study limitations

Several limitations were associated with this study. One of the first major limitations of the study was the challenge of meeting the target for children in the survey. This is because the study was conducted at the time when children were most likely going to be in school. The age group limitation made it difficult to interview children (between 5 and 11 years) during the early hours of the day. However, this was mitigated by enumerators going back to the homes dependent on when the parents allowed the enumerator to come back for the child or children to be interviewed. More children were also interviewed as the survey extended to the June Holiday for primary and secondary school children. This situation, coupled with those cited above, to some extent, affected the sample population obtained for target children in both Khayelitsha and Mitchells Plain.

Secondly, the research had as objective to undertake a 24hrs recall and 7days recall to determine food choice and dietary habit of the population ended with a 24hrs recall due to resource and time constraint. Thus, dietary outcomes were only interpreted for a single period. Anticipating such circumstances, the researcher had to include a question asking if the food eaten was the usual food (Steyn and Labadarios, 2000).

Another important limitation worth noting was the fact that the enumeration period extended into the Muslim Ramadan fasting. This affected particularly Muslim respondents including some of the enumerators who had to stop enumeration to exercise their religious rights. In Mitchells Plain for example, due to it's Muslim population, obtaining a true picture of the dietary recall was difficult. Responses obtained particularly from this population group may not necessarily be a true reflection of their food intake. Here, the question on whether 24-hour recalls were typical of what they ate every day and a follow-up question on reasons for those who responded 'no', helped to track these differences.

5.8 Conclusion

This chapter aimed to describe the methodological approach to the study. This chapter has presented the general research methodology applied throughout the study, the methodological framework for the research project as well as the statistical models applied such as regression analysis, Principal Component Analysis, the Rasch model, and other descriptive statics. Though the study was conducted using a mixed-method approach, it is already stated that qualitative evidence has been reported in the PSPPD Project for which this research is based. Therefore, for purposes of this research, a quantitative paradigm has been applied throughout the study with very limited use of qualitative findings. A detailed consent agreement was presented to the relevant Committee for ethical clearance. The results of these entire processes are presented in the relevant chapters in the form of tables, graphs, and frequencies tables. Chapter 6 has presented the descriptive statistical findings and compared the two areas.

Chapter 6

SOCIODEMOGRAPHIC PROFILE OF CASE STUDY AREA

6.1 Introduction

The chapter was aimed to provide a descriptive analysis of the sociodemographic and economic characteristics of the population of Khayelitsha and Mitchells Plain. It assesses the relationship between household characteristics, sociodemographic and economic characteristics of households. Since household characteristics are key determinants of household food security, it was necessary to assess these characteristics and later measure its implication on food choices and the health status of the population. The chapter further looks at the self-reported health status of household members. The increasing incidence of overweight and obesity and its accompanying health risks place a major burden on individuals, communities, and health care systems throughout the world (Goedecke et al., 2005; Jones-Smith et al., 2012; Kanter and Cabellero, 2012; Loring and Robinson 2014; WHO 2016). Over the last nine years, the South African Government has spent more than R23 billion treating illnesses directly linked to overweight and obesity (Mapumulo, 2015).

6.2 Results: Demographic Characteristics

6.2.1 Household Composition

Household composition is an important indicator of household living conditions. Household characteristics have been used in studying poverty dynamics, inequality measured in terms of gender, race, income, health, and socioeconomic wellbeing of people. The definition of a household is critical as different definitions can lead to different conclusions. Beaman and Dillon (2010) found that when different definitions are applied in surreys they yield different statistical results in household characteristics. Given that there is a disparity in the definition of household, this study applied the most standardized definition of a household- 'Household' as a concept provides a premise on which arrangements for the provisions of food and other essentials for a living are made by a person or group of persons (UNDESA, 2004). Household characteristics

generally comprise information on household size, household types, composition, income, and dwelling types. Sharing of meals, as well as living and spending nights together, are typical characteristics of a household, and as Udjo (2015) rightly points out, this stresses the social rather than the physical attributes of households, although it is incumbent that a household will occupy a physical structure or dwelling unit.

Statistics South Africa defines a household in the census as "a group of persons who live together and provide themselves jointly with food or other essentials for living, or a single person who lives alone" (Statistics South Africa, 2011). Hall and Mokomane (2018) distinguish between 'household' and 'family' as they dissect the fluidity in family and childcare in South Africa. However, given the dichotomy of the two concepts, this study as previously stated in the methodology, the definition of a household but went further to include those who were not immediately present during the survey yet identified as part of the household. This procedure is applied in the South African General Household Survey (GHS) (Statistics South Africa, 2018).

The household characteristics of the population provide a synoptic overview of the current socioeconomic dynamics of the study area. A total of 1051 households were interviewed, comprising a population of about 4300 respondents. In the sample, 43% of respondents were males and 57% were females. While there were more male respondents in Mitchells Plain than in Khayelitsha, i.e. 46% and 40% respectively, there were more female respondents in Khayelitsha than in Mitchells Plain, i.e. 60% and 54% respectively. Table 6.1 below shows the distribution of the population by household.

Table 6-1 Household Composition

	Khayelitsha				Khayelitsha				Pooled	
	Male		Female		Male		Female			
	n=810	%	n=1237	%	n=982	%	n=1145	%	N=4228	%
Household head	197	24.32	251	20.29	295	30.04	201	17.55	950	22.47
Spouse	28	3.46	174	14.07	49	4.99	261	22.79	530	12.54
Son/Daughter	374	46.17	499	40.34	399	40.63	423	36.94	1714	40.54
Brother/sister	55	6.79	84	6.79	28	2.85	28	2.45	199	4.71
Daughter/Son-in-law	6	0.74	10	0.81	32	3.26	33	2.88	81	1.92
Grandchild	108	13.33	141	11.4	137	13.95	135	11.79	526	12.44
Step-child	6	0.74	13	1.05	2	0.2	2	0.17	23	0.54
Parent/Parent-in-law	1	0.12	9	0.73	6	0.61	23	2.01	40	0.95
Others	35	4.32	56	4.53	34	3.46	39	3.41	165	3.9

Source: Author's analysis of empirical data

6.2.2 Relationship to household heads

Household head in South Africa is an important indicator of household wellbeing. The relationship between household members and household dynamics is critical in understand food choices and weight gain. Of the 1051 households that participated in the study, there were 910 (86%) households with household heads. About 141 (14%) of the household has no household head. Female-headed households accounted for 51% of household heads compared to 49% of male-headed housed households. More than 56% of households in Khayelitsha were headed by females. Female-headed households are highly associated with poverty and higher levels of inequality in South Africa (Nwosu and Ndinda, 2018). This evidence buttresses the view that post-Apartheid South Africa is yet to recover from the generational burden of female-headed households caused by apartheid-era policies, According to Nwosu and Ndinda (2018) female and child-headed households are increasing in South Africa, a phenomenon that is highly associated to poverty and inequality, hunger and malnutrition in poor communities.

Table 6-2 Relationship between household head

Relationship between other household members and household heads						
	Khayelitsha		Mitchells Plain		Pooled	
	n=2069	%	n=2159	%	n=4228	%
Household head	450	21.75	500	23.16	950	22.47
Spouse	208	10.05	322	14.91	530	12.54
Son/Daughter	882	42.63	832	38.54	1714	40.54
Brother/sister	141	6.81	58	2.69	199	4.71
Daughter/Son-in-law	16	0.77	65	3.01	81	1.92
Grandchild	251	12.13	275	12.74	526	12.44
Step-child	19	0.92	4	0.19	23	0.54
Parent/Parent-in-law	10	0.48	30	1.39	40	0.95
Others	92	4.45	73	3.38	165	3.9

Source: Author's analysis of empirical data

In Table 6.2 above, the proportion of household members in relation to household head for the two study areas indicates that there was almost no difference between the two areas with respect to relationship to the household head. In Mitchells Plain household heads were 2% more than Khayelitsha. Sons and daughters were 42% in Khayelitsha compared to 38% in Mitchells' Plain. Generally, the result shows that apart from household heads that constituted 22% in the overall sample, close to half of the population 40% were sons and daughters living in households with household heads. The proportion of spouses was 12.54% followed by Grandchildren 12.44%. Similarly, the proportion of grandchildren for both areas was averagely 12% for both Khayelitsha and Mitchells Plain. This is consistent with other household members living with the household heads. Assessing household composition is vital in understanding the dynamics of household nutritional status, socioeconomic circumstances, poverty, and inequality. Several studies have highlighted the implication of household size on food security and poverty alleviation.

Some studies have found sibling effects to be associated with weight gain. Hu (2017) found that children with siblings were more likely to become obese compared to non-sibling children and that second and third born siblings were significantly at risk of obesity compared to non-sibling children. Chapter seven provides a detailed analysis of child obesity.

6.2.3 Age distribution

South Africa's population is on the rise. A recent statically release puts the population at 58.8 million people (Statistics South Africa, 2019). The statistics result further indicates that about 28% of the population is younger than 15 years of age while 9% (5.5million) are 60years and above.

Age distribution of a population is an important indicator of poverty, income, and employment assessments. The average age of the population sampled was 29.88. About 33% of the sample were children. For those whose Age was not missing, the average age was 9.40. Adults accounted for 67% of the sample with an average age of 39. Given that there was more female in the sample than males, mean age for female was 30.71years.

Table 6-3 Age group distribution

Average Age distribution for Khayelitsha and Mitchells Plain						
Children mean Age	N	%	Mean	SD	Min	Max
Children mean Age	1417	33%	9.407128	5.20	1	18
Mean Age Adult	2919	67%	39.83453	15.44	19	88
Mean Age Male	1818	42%	29.028	19.12	1	86
Mean Age Female	2434	56%	30.71898	19.46	1	88

Source: Author's analysis of empirical data

Table 6.4 below shows the distribution of the population according to age grouping in the study area. The result shows that 50% of the population in the survey were between the ages of 25 to 64. This is largely those who are considered to be of working age in addition to the youth population of 15 to 24years. The effects of overweight and obesity and its impact on people of a

working age group and coming from a disadvantaged background has not been tested. What is known in the literature is the effect of obesity on the working class generally. Just about 5% of the population was over the age of 65. This indicates that South African communities are still largely full of economically active people.

Table 6-4 Age group distribution

Age distribution in the sample						
	Khayelitsha		**Mitchells Plain**		**Pooled**	
0-4	179	8%	129	6%	308	7%
5-14	412	19%	376	17%	788	18%
15-24	431	20%	419	19%	850	20%
25-64	1061	49%	1111	51%	2,172	50%
65+	67	3%	151	7%	218	5%
Total	2150	100%	2186	100%	4336	100%

Source: Author's analysis of empirical data

6.2.4 6.2.4 Household Size

Household size is a key indicator of household living conditions. According to the UN (2017) global household size report, households with fewer than three persons are dominant in most of Europe and Northern America. Larger household sizes (five or more persons) are found across Africa and the Middle East. The authors found that the presence of children generally affects the priority of households especially concerning the allocation of resources and demand for food. The average household size was 4 persons, about 1 person higher than the national average. The percentage of people living in 4 person's households was 24% in Mitchells Plain and 18% in Khayelitsha. Furthermore, the percentage of persons living in a 1-3person household was 20.19%, 4-5 persons 40.35%, and 6 persons and above 39.48%. The largest household size was 13 persons. Despite recent evidence by Wittenberg and Collinson (2017) showing a systematic drop in household size in South Africa, this research found that the average household size was one person

larger than the national average presented. Udjo (2015) estimated that the average household size will further drop to 3 persons by 2021. One of the reasons advanced for the continued drop in household size is the improve services and the government's continued effort to mitigate the scourge of poverty and inequality in South Africa (Wittenberg and Collinson, 2017). The two urban peripheries are home to a multitude of people that have migrated or had migrated to the area to live with family or other relatives to find work in the inner city.

In the view of this research, large informal settlements in urban peripheral townships will continue to increase in household size given the influx of new internal migrants from rural areas, and from municipalities with poor services delivery record to the metropolitan cities like Cape Town. According to (Dinbabo et al., 2017) despite spatial imbalances, there are strong rural-urban linkages in South Africa migration patterns caused by widening the rural-urban gap and increase economic opportunities in urban areas. These opportunities continue to attract especially rural women into the labour market in the urban economy. The implication for households is an increase in household size thus increasing the need for food security for new arrivals, especially in informal settlements.

6.2.5 Marital Status

Marital status is another important demographic indicator for identifying household characteristics. Table 6.5 compares the marital status of the study area. It was observed that the proportion of married people in Mitchells Plain compared to Khayelitsha was 21% and 28% respectively. The proportion of unmarried or those who say they had never married was about 74% of Khayelitsha and 63% for Mitchells Plain. Given that the two areas are predominantly black and colored, in addition to their racial divide are religious and cultural boundaries that further the polarization of the two study areas. This result is consistent with Posel and Casale's (2009) findings that the marital rate amongst African women is lower compared to Coloured women. Several factors can be advance for this phenomenon among African women. Some have argued

that the low probability of African women getting married is not the absence of African men, but rather the socioeconomic status of Africa men, the effects of apartheid=d, and high cost of bride price amongst African cultures as associated large under marital status amongst Africans (Posel and Casale, 2009). According to Statistics South Africa, 47% of South Africans over the age of 20 have never married (Stats SA, 2011).

Table 6-5 Marital Status

Marital Status						
Marital status	**Khayelitsha**		**Mitchells Plain**		**Pooled**	
Never married	1506	74%	1106	53%	2612	63%
Married	425	21%	736	36%	1161	28%
Cohabitation	41	2%	29	1%	70	2%
Divorce/Separated	29	1%	90	4%	119	3%
Widowed	44	2%	109	5%	153	4%
Total	2045	100%	2070	100%	4115	100%

Source: Author's analysis of empirical data

6.2.6 Education

In 1953, Hendrik Verwoerd the Apartheid Minister of native affairs introduced the Bantu educational system in South Africa. The Verwoerd policy restricted the quality of educational services offered to Africans (Fiske & Ladd, 2004). These policy restrictions were overturned after 1994. The Constitution of South Africa provides in Section 29(1)(a) of that "everyone has the right to basic education", and section 29(1)(b) in addition to the fact that "everyone has the right to further education", and that the government must ensure that education is "progressively available and accessible". In this section, two variables were used to assess the educational status of the population. Respondents were asked to state their highest level of education. A follow-up question was asked to find out if they were currently enrolled in any educational institution. Walker & Unterhalter, (2007) uphold Amartya Sen's Capability Approach in education, stating that

education affects choices and where there is poor education, there is likely to be a bad decision or poor choices (Walker, & Unterhalter, (2007). Education is a very important human development indicator. The level of education determines employability, income, and other multiple potentials. Branson et al (2012) allude to the link between education and inequality in South Africa. This is evident in the inhuman way in which blacks South Africans were marginalized and deprived of participating in the labour mark and the economy at large. Education has the potential of increasing a person's chance of being employed, reduce the risk of food insecurity and poverty.

In our sample, the results show that 92% of respondents have only attained up to secondary school. Comparing the educational level of the population show that respondents from Mitchells Plain seen to have a slide urge on education over Black South Africa. There was also a clear difference between men and women in terms of their highest qualification.

Table 6-6 Educational Level already attained

Educational Level already attained								
	Khayelitsha				Mitchells Plain			
	Male		Female		Male		Female	
None	124	15%	158	13%	102	11%	85	8%
Primary	193	24%	256	20%	251	28%	331	31%
Secondary	433	53%	704	56%	481	53%	604	56%
Technicon	25	3%	69	5%	43	5%	30	3%
University	40	5%	70	6%	26	3%	32	3%
Total	815	100	1257	100%	903	100%	1082	100%

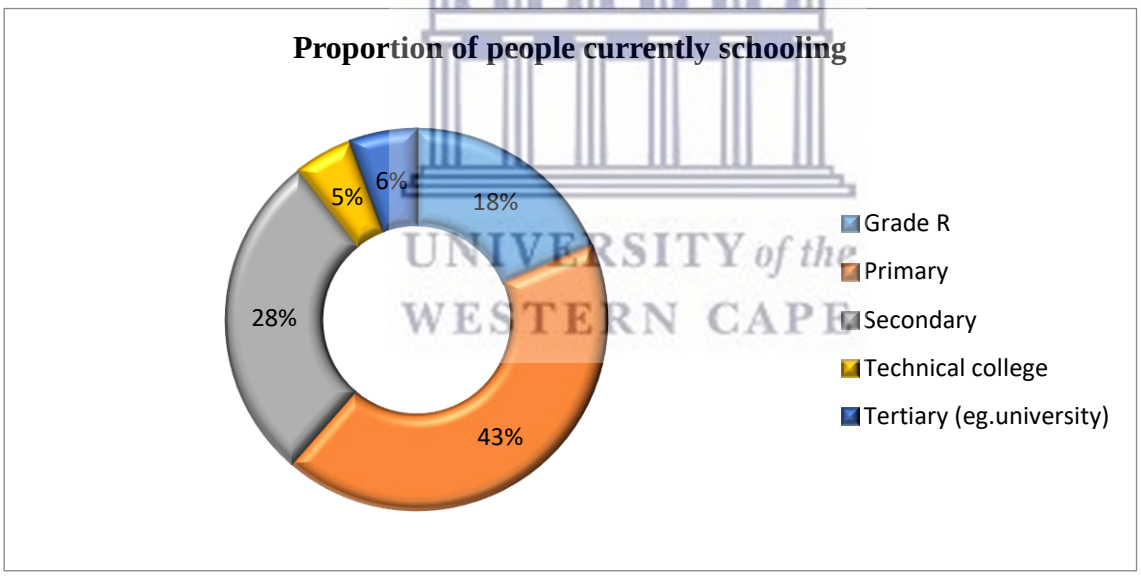
Source: Author's analysis of empirical data

Table 6.6 provides that 15% of males in Khayelitsha compared to 11% in Mitchells Plain have no formal education. Approximate half of the population 53% on average have secondary education as their highest qualification. This evidence showed that the effect of apartheid is still embedded in the fabrics of the South African system. Apartheid deprived millions of South African children

and adults of accessing basic education. And where such was available it was highly under-resourced.

Furthermore, the proportion of respondents currently schooling showed that primary and secondary schools constitute 71% of our sampled population. It is intriguing to note that despite the high number of children that currently attend school in the study area, just about 11% attend post-secondary education, a figure that is lower than the 14.1% reported by Statistics South Africa (2015). From a constitutional perspective, the above result does not seem to show that children in Khayelitsha and Mitchells Plain are likely going to attend postsecondary education. Progressive education has a long-term cumulative impact on children's socioeconomic and health status which impacts the labor market participation at age of majority.

Figure 6-1 Current educational levels



Source: Author's analysis of empirical data

The result of respondents that were undertaking any type of schooling ranges from Grade R to tertiary education. The findings in Figure 6.1 above showed that 6% of respondents were currently doing the pre-schooling program, 14% were in primary school, 9% in Secondary, and just 4% attended tertiary institution. Given that education is a determinant factor in food choices, a community with very low educational status is mostly to make an unhealthy food choice. From

the result, overall, 67% of the population had no schooling while just 33% were attending school. However, the main concern drawn from the above result is that comparing the highest education and schooling, we found that the two communities are still largely undereducated which impacts their socioeconomic wellbeing. According to Stats SA, (2015), about 14% of South Africa's populations have a post-secondary qualification. This is a clear indication that the education of the poor is still a major challenge in South Africa.

Table 6-7 Currently Schooling

Currently Schooling	Currently Schooling					
	Khayelitsha		Mitchells Plain		Pooled	
	N	%	N	%	N	%
Grade R	151	7.32	90	4.79	241	6%
Primary	296	14.34	257	13.68	553	14%
Secondary	213	10.32	149	7.93	362	9%
Technical college	48	2.33	16	0.85	64	2%
Tertiary (e.g. university)	45	2.18	28	1.49	73	2%
No	1311	63.52	1338	71.25	2649	67%
Total	2064	100	1878	100	3942	100%

Source: Author's analysis of empirical data

6.2.7 Religion

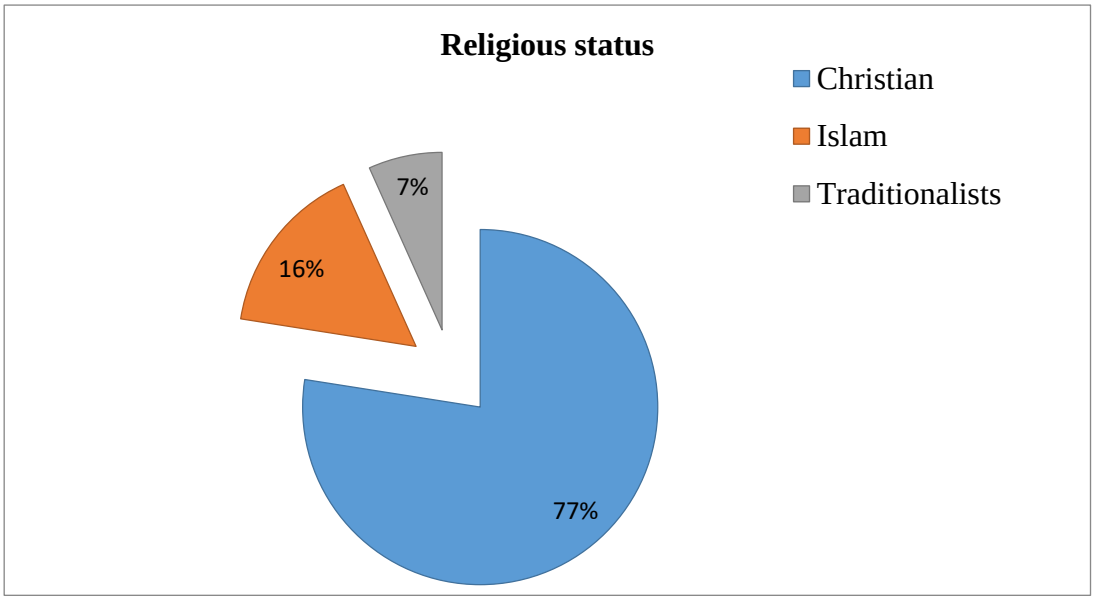
Religion has always been at the center of human history and its implication on food security well documented (Levin,1996; Bhagwat, Ormsby, & Rutte, 2011 and Shani, 2014). It is important to note that any analysis of people's food choices without considering religious and cultural backgrounds or belief system could potentially lead to erroneous outcomes. The world is a religious world and religious conflicts are one of the oldest conflicts in human history. South Africa is a multicultural and religiously diverse society. Religious symbolism is strongly attached to foodstuff. An example is the halal food requirements for Muslim societies especially in South

Africa (Bashir et al., 2019). Beer (2010) noted that in ancient Greece, certain food types were prohibited because of religious symbolism such as beans and fish despite the food being rich in micronutrients. Byarugaba, (2017) establish that religious symbolism contributes to systematic food insecurity, arguing that the influence of religion in food choices under the guise of purification could even lead to human right abuse [*my emphases*]. In the context of South Africa, food choices and religious symbolism have not been sufficiently addressed.

> For example, recently I had a conversation with a nurse who works in one of the hospitals in KwaZulu-Natal, South Africa. She narrated a case of a nine-year-old girl who was brought to the hospital, chronically ill and almost dying from different kinds of diseases. After a thorough examination, it was discovered that the girl was suffering from recurring hunger. Surprisingly, the medical team discovered that the cause of hunger was not the lack of food at the girl's home but the fact that she was not allowed to eat some kinds of nutritious foods because she was being initiated to become a spiritual medium commonly known as a sangoma[the traditional doctor](Byarugaba, 2017, p.15).

During the field data collection, one of the observations was that the data collection process towards the end coincided with Muslims Ramadan's fasting. This could have had a huge implication on the 24h recall. Adjustments were therefore made for when to carry out interviews in Muslim dominated residential areas in Mitchells. This demographic characteristic is used to increase our knowledge of food choices and BMI. The findings showed that nominal Christianity was 77% of the sample followed by Islamic religion 16% and 7 % was African traditional religion.

Figure 6-2 Religious status



Source: Author's analysis of empirical data

The population of Mitchells Plain and Khayelitsha is highly dominated by people affiliated with Christianity. The share of Christianity for Khayelitsha was 43% compared to 34.5% in Mitchells' Plain. Though 16% of the population of Muslims makes up the population of both areas, the share of Muslims living in Khayelitsha was just 0.2%. Almost of the people affiliated to Africa, the Traditional belief system lives in Khayelitsha (Table 6.8). The table also shows traditionalists make the second most dominant religion in Khayelitsha.

Table 6-8 Share of religious distribution

The religious status of Khayelitsha and Mitchells Plain						
	Khayelitsha		**Mitchells Plain**			**Total**
Christianity	1857	43.0%	1491	34.5%	3348	77%
Islam	8	0.2%	675	15.6%	683	16%
Traditionalist	275	6.4%	15	0.3%	290	7%
Total	2140	49.5%	2181	50.5%	4321	100%

Source: Author's analysis of empirical data

6.2.8 Race

South Africa is a multiracial country with a historical background of racial discrimination, poverty, and inequality. Its racial divide impacted the representativeness in the economic system in terms of access to land and the unequal distribution of resources (Gradin, 2013; Valji, 2004). Khayelitsha and Mitchells Plain are two urban peripheral townships created under the apartheid system to segregate Blacks and Coloured people from the inner city. Khayelitsha and Mitchells Plain are predominantly Black and Coloured. The result of the survey shows that 99% of the population of the study area was predominantly Black and Coloured people. Asians/ Indians and Whites only made 1% of the population sampled. Blacks were 56% compared to 47% White populace.

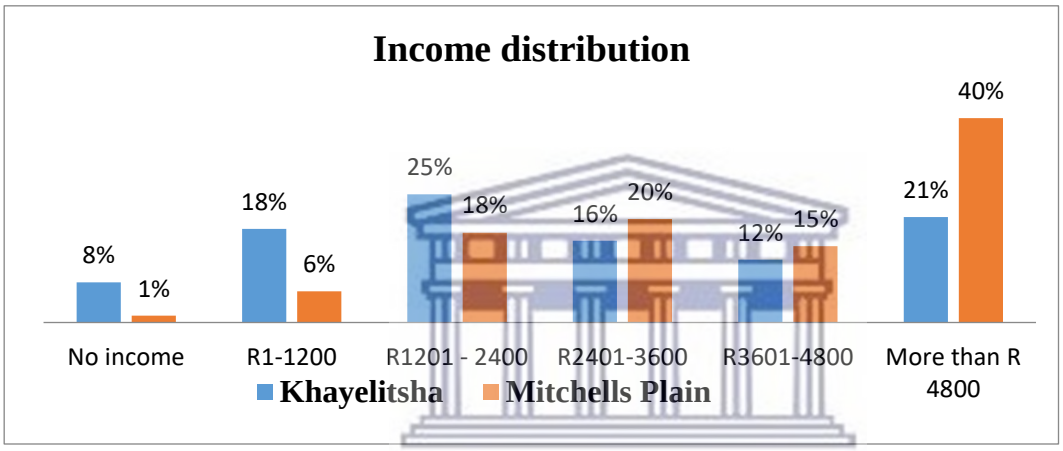
6.3 Socioeconomic Characteristics

Khayelitsha and Mitchells Plain were created under the Group Area Act of 1950. The Act segregated and classified Black and Coloured people according to the race group and assigned them according to their economic and deemed social status. Thus, people with marginal incomes were clustered together in these areas. The data collected from the two areas suggest that unemployment, perversity, and high levels of inequality are characteristic of the two communities. The socioeconomic structure of Khayelitsha and Mitchells Plain is characterised by poverty, unemployment, housing, and low levels of education (City of Cape Town 2007). In 2007, the socioeconomic condition of Khayelitsha and Mitchells Plain was considered to be the worst compared to other districts within the Cape Flat Metro (City of Cape Town, 2007). Since 2007, not much has changed in terms of living conditions as well as infrastructural development. This section, assess some of the socio-economic challenges of the study area and the impact on food choices.

6.3.1 Household Income

South Africa in general and Cape Town, in particular, continue to face enormous social challenges which are a consequence of its distorted pattern of income distribution across race and gender. The result in Figure 5.3 shows that 40% of the population of Mitchells Plain earned above 4800 was almost double that of Khayelitsha. Similarly, on the lower scale, just about 1% of the sample in the Mitchells Plain indicated they have no income compared to 8% of the population in Khayelitsha. Besides, about 25% of the population of Khayelitsha earned from R1200 to 2400.

Figure 6-3 Household Income



Source: Author's analysis of empirical data

In general, however, about 67% of the Khayelitsha population in the sample earned less than R3600. This result corroborates with other studies that showed that black South Africans are at the tail end of socioeconomic. Income is a key determinant of food choices in South Africa. According to Statistics South Africa census 2011 report, 73% of households in Khayelitsha had income lower than R3200 per month and 18% had no source of income. Seekings, (2013) concur that the average household income in the Khayelitsha was R1600 per month. Lephakga, (2017) showed how colonial institutions created institutionalized poverty and reduced black South Africans into social destitute.

6.3.2 Income from Social Grants

South Africa currently operates one of the biggest social security systems in Sub-Saharan Africa. Social support is one of the country's major poverty alleviation strategy which contributes to addressing the social vulnerability of adult and children. Income from social grants are categorised into Child Support Grant (CSG), Old-age Grant (OG), Disability Grant (DG), and Foster Care Grant (FCG) (Dinbabo et al., 2017; Makiwane, 2010). According to Carter and May (1999), there are four main sources of household income in South Africa; self-employment, wage income, private transfer, and public transfer. Public transfers are made without any exchange for goods or services. The South African Social Security Agency (SASSA) is the custodian of social grants in South Africa under the Department for Social Development (DSD).

Figure 6.9 shows that 44% of households are recipients of CSG. About 59% of all grant recipients were CSG. In Mitchells Plain, the OAG was the highest share of grant recipient 52% compared to Khayelitsha 24%. The result shows that OAG was 37% after CSG. Besides, it was found that 68.45% of all who receive CSGs earn an income of R3600 and less. The evidence corroborate other studies on that CSG is a safety net for poor households in South Africa (Dinbabo, 2011).

The result shows that there was a significant difference between the populations with p-value<0.05 for all groups of income. While households in Khayelitsha receive CSG, Mitchells Plain population received more of OAG. This result adds to the evidence that the population dynamics of the two racially divided urban townships can no longer be classified under the same theme for purposes of resource allocation.

Table 6-9 Income from Social Grants

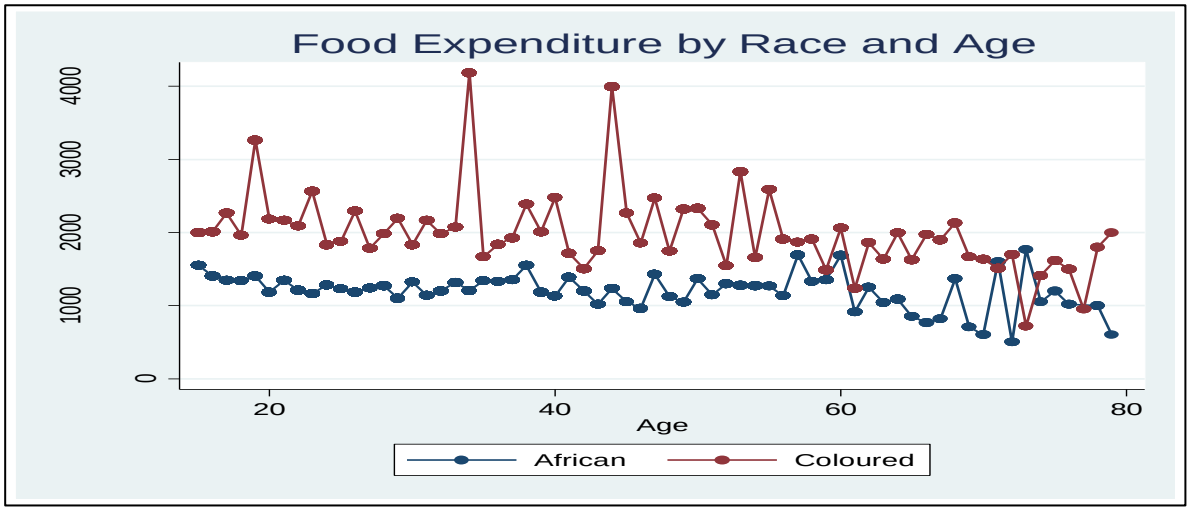
Income from Social Grants in the case study area					
	Khayelitsha	Mitchells Plain	Pooled	Chi2	P-value
CSG	59%	26%	44%	390.79	0.000
DG	13%	14%	14%	5.6250	0.060
OAG	24%	52%	37%	144.1403	0.000
FCG	4%	7%	5%	14.4313	0.002

Source: Author's analysis of empirical data

6.3.2.1 Food Expenditure by Race

Household food expenditure of the population showed that the mean household food expenditure was approximately R1500. About 68% of households in Khayelitsha spend less than the mean food expenditure compared to 32% in Mitchells Plain. To obtain the adult equivalent of household food expenditure, household food expenditure was divided by the household size adjusted for Age. The results show that the average adult equivalent of food expenditure was *mean=R3371 and sd=339.7013. The results also show that using a ttest, food expenditure was not significantly different by gender. However, there was evidence that people in Mitchells Plain spend more on food than people in Khayelitsha with p<0.05.*

Figure 6-4 Food expenditure



Source: Author's Analysis of empirical data

6.3.3 Access to basic Services

Access to basic service has been a major cause for concern in the last two decades in South Africa. Service delivery protest has become a common phenomenon in South Africa generally and Cape Town in particular. The purpose of household assertation is to interrogate the relationship between access to basic services and overweight and obesity. The section focused on access to water, distance to fetch water, hygiene-related services such as the type of toilet facility, the ratio of population to toilet facility, access to electricity, the main sources of energy for lighting and cooking.

The result in Table 6.10 below shows that 77% of the households had access to pipe tap water. In Mitchells Plain, 92% had access to piped water compared to 64% of households in Khayelitsha. In Mitchells Plain, just about 7% of households have tap water outside of the yard compared tom 17% of Khayelitsha. In terms of distance to water source, 46% of the sampled population walk for less than 100m to access water. About 48% walk from between 100m to 200m to fetch water daily. Since physical activity can help reduce weight gain, Levine et al (2008) found that overfeeding decreases walking and that progressive decreases in walking contribute to a progressive increase

in weight gain. Furthermore, this research found that very few people travel for longer distances of up to half a kilometer to fetch water, evidence of an improved social services system. This evidence suggests that in terms of access to basic resources, Mitchells lain seem to have a better socioeconomic status compared to Khayelitsha.

Table 6-10 Socioeconomic characteristics

Household Access to Basic Services							
	Khayelitsha		**Mitchells Plain**		**Pooled**		**P-Values**
Main Water Source	**N**	**%**	**N**	**%**	**N**	**%**	
Piped (tap) water in	339	64%	469	92%	808	77%	0.000
Piped (tap) water on site	91	17%	38	7%	129	12%	
Public tap	100	19%	1	0%	101	10%	
Borehole on site	2	0%	3	1%	5	0%	
Total	532	100%	511	100%	1043	100%	
Distance to Water Source							
Less than 100m	341	65%	132	26%	473	46%	0.000
100 - 200m	135	26%	358	70%	493	48%	
201 - 500m	36	7%	17	3%	53	5%	
501-999m	10	2%	1	0%	11	1%	
1 km or more	1	0%	0	0%	1	0%	
Total	**526**	**100%**	**509**	**100%**	**1035**	**100%**	
Toilet Facility							
Flush toilet with on side	322	61%	368	73%	690	67%	0.000
Flush toilet with off	123	23%	135	27%	258	25%	
Chemical toilet	55	10%	0	0%	55	5%	
Pit latrine with vent	16	3%	0	0%	16	2%	
Pit latrine without v	12	2%	0	0%	12	1%	
Others (Specify)	3	1%	0	0%	3	0%	

Total	531	100%	503	100%	1034	100%	
Toilet Facility shared							
Yes	230	43%	143	28%	373	36%	0.000
No	302	57%	367	72%	669	64%	
Total	532	100%	510	100%	1042	100%	
Access to Electricity							
Yes	422	82%	442	88%	864	85%	0.000
No	95	18%	57	11%	152	15%	
Total	517	100%	500	100%	1017	100%	
Main source of energy for lighting							
Electricity from main	525	99%	505	99%	1030	99%	0.000
Electricity from gene	2	0%	3	1%	5	0%	
Gas	0	0%	3	1%	3	0%	
Paraffin	1	0%	0	0%	1	0%	
Total	528	100%	511	100%	1039	100%	
Main source of energy for cooking							
Electricity from main	505	96%	469	92%	974	94%	0.000
Electricity from gene	7	1%	10	2%	17	2%	
Gas	10	2%	29	6%	39	4%	
Paraffin	3	1%	0	0%	3	0%	
Others (Specify)	1	0%	0	0%	1	0%	
Total	526	100%	508	100%	1034	100%	

Source: Author's analysis of empirical data

Results for social services such as toilet facilities show that 64% of the population has access to flush toilet systems. About 25% have a toilet with outside disposal while 5% still use chemical toilets in the study area. But 61% of the population sampled in Khayelitsha have access to the toilet within the household compared to 73% in Mitchells Plain. In general, 67% of the population of

households have access to flush toilets at home. Also, it was found that the majority of households have access to electricity (85%). Poor hygiene conditions in poor communities is reported to be highly associated with cholera. The implication of poverty on the health of the poor in poor communities is not new. Evidence in the United States shows that cholera deaths during outbreaks in 1832 and 1854 were found to impact the poor severely due to poor hygiene conditions that let to the metropolitan health Law to improve Sanitary conditions in the Metropolis (Chokshi, 2018). Poverty caused by ill health is described as the root cause of poverty in rural China (Zhou et al., 2020). Poverty becomes a vicious circle as people get sick and are unable to undertake economic activities to improve their livelihoods.

Electricity remains the main source of energy for household consumption with 99% using electricity as the main source of energy besides generator, and gas cooking systems, paraffin fuel, and solar energy. About 94% of households use electricity as cooking fuel for the household. Access to electrical energy is a useful resource for food storage and mitigates food wastage. According to Schneider (2008), about 25 % of global edible food is wasted. However, though this research does not interrogate on the extent of the use of electricity, albeit a majority of the population depends on the government's social support, with the increase in electricity tariffs by South Africa's energy supplier, there is a risk of increasing household food insecurity.

6.3.4 Household Characteristic by Asserts

In Table 6.10 below, the result shows that about 91% of the population own a refrigerator. In mitigating the food wastage, households have also adopted the option of a freezer which provide more space for perishable food items and a better cooling stems that could take months of storage. Data was also collected for other environmental instruments for unconventional obesity prevention and management resources. Households that own a radio set were 76%, Television was 93%, landline phone 19%, cell phone 96%, computer desktop, and laptops were 29%. About 64% of the

population owned a washing machine, just about 18% owned a bicycle, 3% owned a motorcycle and 33% owned a car/truck.

Table 6-11 Household Characteristic by Asserts

Household Characteristic by Asserts							
	Khayelitsha		**Mitchells Plain**		**Pooled**		**P-Values**
Household owns a radio	N	%	N	%	N	%	
Yes	395	74%	400	78%	795	76%	0.333
No	136	26%	112	22%	248	24%	
Total	531	100%	512	100%	1043	100%	
Household owns a TV							
Yes	486	92%	491	95%	977	93%	0.000
No	45	8%	26	5%	71	7%	
Total	531	100%	517	100%	1048	100%	
Household owns a landline phone							
Yes	30	6%	165	32%	195	19%	0.000
No	500	94%	346	68%	846	81%	
Total	530	100%	511	100%	1041	100%	
Household owns a computer							
Yes	79	15%	224	44%	303	29%	0.000
No	451		287		738		
Total	531		511		1042		
Household owns a Refrigerator							
Yes	473	90%	479	93%	952	91%	0.001
No	55	10%	35	7%	90	9%	
Total	528	100%	514	100%	1042	100%	
Household owns a Freezer							
Yes	179	34%	347	68%	526	51%	0.000

No	344	66%	167	32%	511	49%	
Total	523	100%	514	100%	1037	100%	
Household owns a washing machine							
Yes	223	42%	451	88%	674	64%	0.000
No	307	58%	64	12%	371	36%	
Total	530	100%	515	100%	1045	100%	
Household owns a mobile phone							
Yes	511	96%	489	95%	1000	96%	0.487
No	21	4%	26	5%	47	4%	
Total	532	100%	515	100%	1047	100%	
Household owns a bicycle							
Yes	36	7%	143	28%	179	17%	0.000
No	495	93%	372	72%	867	83%	
Total	531	100%	515	100%	1046	100%	
Household owns a motorcycle							
Yes	3	1%	24	5%	27	3%	0.000
No	529	99%	487	95%	1016	97%	
Total	532	100%	511	100%	1043	100%	
Household owns a car/truck							
Yes	109	20%	232	45%	341	33%	0.000
No	423	80%	282	55%	705	67%	
Total	532	100%	514	100%	1046	100%	

Source: Author's analysis of empirical data

The implication of household asserts on body weight management may be underestimated but have far-reaching effects on weight management. Household food preservation asserts are likely to improve increase household food security, mitigate the effects of hunger, and enhances food availability and visibility. While the possession of car can have a significant but positive effect on

food access and food availability, research has shown that there is little knowledge about physical activity trends in communities and even nationally yet physical activity is known to have a very positive effect on obesity prevention and management (Fox & Hillsdon, 2007). Given this premise, the household asserts such ownership of a car is known to reduce the physical activity of the household members, and where lifestyle food choices are sedentary, there is a high probability of an increase in weight gain. Lear et al (2014) found that owners of cars, television, and computer were found to have a high probability of weight gain and associated NCDs

Table 6.12 shows the differences in household asserts for the two populations. The table reveals that the two populations are significantly different in terms of ownership of most of the assets presented at $P<0.05$. But the ownership of radio and cell phone were not significant. Policies targeting the most vulnerable communities and households need to change towards specific conditions of households where poverty is endemic. In Khayelitsha for example, 6% of households interviewed owned a landline telephone system compared to 32% of people in Mitchells Plain. Most households owned a television (93%), Refrigerator (91%) Mobile Phones (96%) concerning the entire population. However, key assets that could contribute to economic empowerment for the population and the household were very rear. Oluwatayo and Babalola, (2020) found evidence of nonmonetary assets associated with household poverty in South Africa using a nationally representative sample.

Table 6-12 Significance of household asserts

Household Characteristic by Assets							
	Khayelitsha		**Mitchells Plain**		**Pooled**		**P-Values**
	N	%	N	%	N	%	
Household owns a radio	395	74%	400	78%	795	76%	0.333
Household owns a TV	486	92%	491	95%	977	93%	0.000
Household owns a landline phone	30	6%	165	32%	195	19%	0.000
Household owns a computer	79	15%	224	44%	303	29%	0.000

Household owns a Refrigerator	473	90%	479	93%	952	91%	0.001
Household owns a Freezer	179	34%	347	68%	526	51%	0.000
Household owns a washing machine	223	42%	451	88%	674	64%	0.000
Household owns a mobile phone	511	96%	489	95%	1000	96%	0.487
Household owns a bicycle	36	7%	143	28%	179	17%	0.000
Household owns a motorcycle	3	1%	24	5%	27	3%	0.000
Household owns a car/truck	109	20%	232	45%	341	33%	0.000

Poverty analysis using income and expenditure have been largely limited in predicting household poverty levels. Household assets have been used to show the real condition of households. Purchasing power parity increases with an increase in income and thus where household incomes are low, access to capital related assets is less likely to be present in the households (Jolliffe and Prydz, 2015). High asset value at the household level has been found to act as securities in times of need. Given that income has been one of the major instruments for measuring poverty (Leibbrandt et al., 2007), household wealth increase should be monitored in a similar way to assess the changes in the poverty dynamics of the population. In this study, given the level of differentiation in the existing study area, policies targeting vulnerability must be revised on an evidence perspective to address household poverty of the real poor amongst the poor. In addition, measures to protect those who have an increase in wealth assets have to be put in place to reduce the chances of falling back into poverty.

6.4 Conclusion

The main aim of this chapter was to present a descriptive analysis of the demographic and socioeconomic profile of the case study area. A key objective was to identify if there are any differences in the two populations given their proximity and historical heritage.

The chapter examined the sociodemographic and economic characteristics of the population. Also, it provides an understanding of the variation of former racially divided communities. The results show a clear distinction between the populations that were significant. There was a significant

difference between the population in terms of income, access to government grants, socioeconomic indicators, and household assets. In this respect, the chapter concludes that the government needs to rethink its policies for poverty alleviation especially for the black population and formally disadvantaged groups who remain most vulnerable in the social structure and needing economic reintegration. It further proposed that policies related to the health status of urban peripheral dwellers need to be given greater attention, with evidently different dynamics on the ground, there is a need for a multi-stage approach in addressing the sociodemographic and economic challenges faced by vulnerable groups in urban South Africa. The next chapter established a link between sociodemographic and economic characteristics on the health status and lifestyle food choices of the two population groups. It examined BMI prevalence of overweight and obesity in the case study area.

Chapter 7

AN ASSESSMENT OF OVERWEIGHT OBESITY IN KHAYELITSHA AND MITCHELLS PLAIN[9]

7.1 Introduction

Public health systems globally are overwhelmed with the growing incidences of overweight and obesity. The problem that was largely associated with developed countries has seen an unprecedented rise in the last two decades in developing countries and sub-Saharan Africa in particular (Bigna and Noubiap, 2019). Sub-Saharan Africa has been experiencing a surge in the burden of NCDs driven by an increased incidence of overweight and obesity, hypertension, diabetes, and an unhealthy eating lifestyle (Gowshall and Taylor-Robinson, 2018).

Obesity remains a major public health concern worldwide. The world has seen a dramatic shift in the pandemic towards developing countries with growing urban populations. Overweight and obesity have a huge implication on national budgets as the cost of health care systems could increase significantly with current trends of obesity. Mapumulo (2015) states that the cost of NCD in South Africa will exceed that of infectious diseases in the future, with annual health care expenditure estimated to rich R8billion. In 2016, public health expenditure in South Africa increased to 9% of Gross Domestic Product (Day and Gray, 2016). Despite the increase in public health expenditure for the past decades, (Hlafa et al., 2019) found a significant correlation between public health expenditure and health outcomes. The increase in public health expenditure is one of the government's responses to address the problem of inequality by granting greater access to health care services to the formerly disadvantage communities in South Africa (Barron and Padarath, 2017).

[9] Part of this chapter has been published titled: South African Adults at Risk of Overweight and Obesity: An Assessment of the Association of Food Choices and Body Mass Index in Khayelitsha and Mitchells Plain. *Ghana Journal of Development Studies 16, 51–67.*

The prevalence of obesity in South Africa is increasing rapidly. A study conducted between 2008 and 2013 revealed that women remain highly susceptible to obesity compared to their male counterparts. South Africa is ranked amongst the top with obesity in sub-Saharan Africa (Ng et al. 2014). The National Income Dynamics Study (NIDS) indicates that more than one-third of women over the age of 15 were found to be obese compared to just eleven percent of men. The 2012 South African National Health and Nutrition Survey (SANHANES-1) confirms the findings of the NIDS that thirty-nine percent of women in South Africa are classified as obese compared to ten percent of men who were considered obese (DOH 2015).

The prevalence of overweight and obesity is not limited to adults. In South Africa, overweight and obesity amongst adolescents and children are well documented. According to the SANHANES-1 about 18% of children 2-5years were overweight and obese and children 6-14 years combined showed that 13% were overweight and obese, which were greater than the global average of 10% (Shisanae et al., 2013). In a recent report, the risk of NCD associated with obesity shows that "35% of South Africans above the age of 35 suffering from hypertension and 10% have diabetes (Berry et al., 2018, p.1). These figures buttress the point that the population is at risk and the likelihood of increasing government spending on NCD.

Given the rise in obesity and associated risk factors in South Africa, not many studies have explored the contribution of food patterns in South Africa and specifically amongst people living in urban Townships in South Africa. Measuring the health status of the population and finding any association and patterns was important to understand the food choices in the study area and its implication on their health status. This chapter examines the links between food choices and BMI in adults living in Khayelitsha and Mitchells Plain in Cape Town. as well as its correlation to the socio-demographic characteristics of the population.

7.2 Prevalence of overweight and obesity worldwide

In 2014, more than 1.9 billion adults were classified as overweight, about 39% of adults worldwide. Of these, 600 million were obese, translating into a total of 13% of the world's adult population (WHO 2016). The report also stated that between 1980 and 2014, the worldwide prevalence of obesity more than doubled. From 2000 to 2010 there was an increase of 31% in the prevalence of early childhood overweight and obesity and it is forecast that by 2020 the increase in obesity will be 36% (de Onis et al., 2010, p.1262).

7.2.1 Trends and prevalence of obesity in Africa

Obesity remains a major public health concern in African as more developing countries in Africa undergo rapid urbanization. Ng et al. (2014) found that Libyan women had the highest incidence of North Africa with Libyan men found to be more obese than women. Some studies have shown that undernutrition in Sub Saharan Africa(SSA) contributed to delaying the spread of the obesity pandemic in the Region (Sartorius et al., 2015). Obese patients in Senegal and South Africa were found to be more susceptible to NCDs such as diabetes and arthritis, than non-obese patients (Asfaw, 2006). When Adeboye, Bermano, and Catherine (2012) examined the trends and patterns of obesity in Africa, their findings confirmed previous observations on the role of increased consumption of over-processed food in Africa's urban towns and cities as a major contributing factor to weight gain is SSA.

Kengne et al. (2013) found that diabetes mellitus was highly associated with obesity after assessing data for a ten period with selected African countries. There was a strong positive correlation between physical inactivity and dietary change and obesity which were factors that intensified insulin resistance.

Poverty and inequality are contributing factors of obesity in most developing countries. Ziraba et al. (2009) conducted an analysis of national health survey data from seven countries in sub-Saharan

Africa and found that, in the period 1993 to 2005, obesity was higher in poorer households by 35% in the ten years compared to wealthy households. This finding contradicts global trends which indicate that more wealthy households in low- and middle-income countries tend to be overweight. In Adeboye, Giovanna, and Rolland (2012), a positive relationship between obesity and higher socio-economic status was established. This may suggest that while obesity was rising in general, richer households were able to curb its increase compared to poor households. The results were similar regarding the education variable. Whereas all the studies reviewed focused on different aspects of health, they all confirm that obesity is rising rapidly in Africa (Adeboye et al., 2012; de Onis et al. 2010 and Ng, et al. 2014). The above authors also agree that there is an established link between obesity, nutrition transition, and some chronic diseases like hypertension and diabetes.

7.3 Obesity trends in South Africa

Several studies have been conducted on the determinants of obesity amongst South Africans (Puoane et al., 2002; Ng et al. 2014; Mickelsfield et al., 2013; Kruger et al., 2005). Findings from these studies show a recurrent theme such as cultural beliefs and lifestyle behavior in association with weight gain or a significant increase in body sizes. From a gender perspective, black South African women, were positively associated with body size and wealth (Puoane et al., 2002). Women in the survey showed evidence that obesity was associated with good health while thinness was perceived to be associated with HIV/AIDS (Puoane et al., 2002; Mickelsfield et al., 2013). Kruger et al. (2005, p.492-493) arrived at a similar conclusion about the connection between cultural beliefs and perceptions about bodyweight amongst South Africans but cited other factors such as the nutrition transition based on globalisation, dietary practices, and socio-economic factors as impacts.

Another factor highlighted in the literature is that South Africans generally seem to have a tranquil attitude towards personal health care. Research has shown that concerning less serious health conditions, the majority of South Africans choose to self-medicate rather than consult a health care

provider (Statistics South Africa, 2013, p.94). Some of the reasons given for these choices include that treatment is 'too expensive' or 'health services are too far' (inaccessible) or 'not necessary/problem not serious enough.

A similar attitude has been observed in dealing with weight management. In a survey of healthcare and non-healthcare workers, Skaal and Pengpid (2011) found that about 37.5% of workers were obese and 9.5% were severely obese. Surprisingly, more than 55% viewed their weight as normal, while 56% (healthcare workers) and 61% (non-healthcare workers) were satisfied with their current body weight. The most recent study conducted in 2013 amongst black women in Durban showed that 76% were obese and only about 27% perceived themselves as having a large body image while 99% associated thinness with HIV/AIDS (Devanathan et al., 2013). A similar study conducted in the Northern Cape Province revealed that a total of 72% of respondents were obese, whilst only 14.6% acknowledged that they were clinically obese (Hoffmann 2013). Most of the respondents in this study reported obesity-related illnesses like hypertension (24.3%), T2D (8.4%), and arthritis (6.3%) whilst some perceived obesity as a symbol of wealth and comfort in life and beauty. The one interesting finding of this survey is that obesity was high amongst middle-income earners.

The latest available national data in South Africa is found in the recent National Health and Nutrition Examination Survey (SANHANES-1) conducted in 2013. The findings of SANHANES-1 do not provide anthropometric data for current BMI amongst adults. However, there is an indication in the report that more than "63% of South African women and about 69% of men are happy with their current body weight" (HSRC and MRC, 2013, p.191). In addition, data amongst children show that 'the mean weight (kg) and height (cm) of participants aged 0 to 14 years by sex, age, locality, province, and race, for South African girls were significantly heavier than boys (27.2kg vs 24.8kg) and they were also marginally taller than boys' (HSRC and MRC, 2013, p.201). Reflecting on the overall findings in the literature leads to the conclusion that obesity is on the rise

in South Africa and amongst one of the highest in the African region, affecting all age groups. The challenge in South Africa is that the majority of citizens do not seem to perceive obesity as a health risk or problem as evidenced in Devanatha et al. (2013) and Hoffmann (2013).

7.4 Results

7.4.1 Socio-demographic characteristics

In this section, we present the socio-demographic characteristics of the population. Gender distribution patterns indicate that 58% were females while males make up 42% of the population. While there were more male respondents in Mitchells Plain than in Khayelitsha, i.e. 46% and 40% respectively, there were more female respondents in Khayelitsha than in Mitchells Plain, i.e. 60% and 54% respectively. In general, adult aged 18+ constitute 74% of the sample (*n*=3175). Across South Africa, the proportion of households headed by women has risen because of the increased economic independence of women (due to the steady feminization of employment and the expanded access to social grants) as well as changing marital and familial norms. The average age of all adults was 37. The average age for men was 37 while that for women was 38. In general, 67% of the population was between the ages of 24 to 64 years.

The household size in South Africa is a key poverty indicator and is relevant for policy development (Maziya et al., 2017). Household sizes for both areas were similar. Households with 4 persons constitute 38% while 26% live in households with 6 or more persons. About 36% of the sample live in households of between 1-3 persons. Respondents were asked to report on the overall household income from all persons working or earning an income in the household. Given that the average household size was 5 persons, cumulatively 75% of the sampled population live in a household of 1 to 6 persons. About 77% of households reported on their household income. The results show that the average household income was R2401-R3600. About 29% of households earned income above R4800, while about 5% of households earned income below R1200.

7.4.2 Prevalence of overweight and obesity in adults

The result of the prevalence of BMI in the study areas showed that the average BMI was 27kg/m^2, and indicates a population that is highly overweight. Overall, about 60% of adults sampled were overweight and obese. The results portray a strong indication of the risk of the increase in overweight and obesity in urban townships. When disaggregated, 28% were overweight, 16% were in their first stage of obesity, 11% were in stage two obesity and 9% were in stage three obesity. The difference between the two areas was not significant. This is justifiable in that, household characteristics and lifestyles were similar.

Table 7-1 Prevalence of overweight

Body Mass Index in % of All Adults			
Weight Measure	Khayelitsha	Mitchells Plain	Total
	N=748	N=754	N=1502
Underweight	11.23	10.74	10.99
Normal weight	28.07	29.71	28.89
Overweight	22.59	23.08	22.84
Obese class I	16.84	16.31	16.58
Obese class II	11.36	10.61	10.99
Obese Class III	9.89	9.55	9.72

Source: Author's Analysis of empirical data

Furthermore, comparing the two areas we found that about 34% in Khayelitsha compared to 32% in Mitchells Plain were obese. The percentage of normal weight for both areas averaged 20%. There were fewer underweight people in Khayelitsha-17%, compared to Mitchells Plain 21%. However, these differences were not statistically significant but confirm previous reports about

the high prevalence of overweight and obesity in South Africa (Puoane et al., 2002; Ardington and Gasealahwe 2012; DoH 2015; Skaal and Pengpid, 2011).

7.4.3 Gender and BMI in Khayelitsha and Mitchells Plain

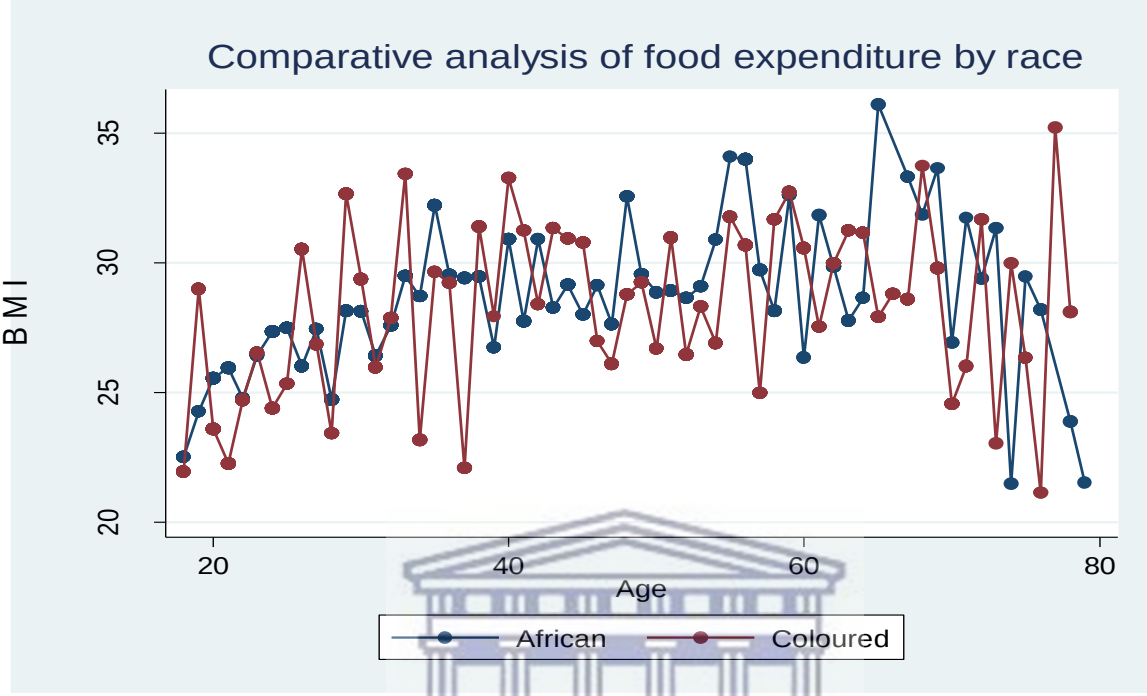
The results from a gender perspective, 45% of males in Khayelitsha were obese compared to 37% of males in Mitchells Plain. There was a significant difference in BMI by gender. The mean BMI for females was 27.77 and the mean BMI for males was 25.92 at p-value= 0.0018. Our findings show that in the two areas, underweight was 4% higher in Mitchells Plain than in Khayelitsha. About 26% of respondents in Khayelitsha were of normal weight compared to 25% in Mitchells Plain. In the same vein, 34% of respondents in Khayelitsha were found to be obese compared to 32% in Mitchells Plain. Overall, the study found that mean BMI was significantly higher for Khayelitsha than in Mitchells Plain *t=3.0420 and p-value=0.0012*. Gender differences in BMI have been well documented in the literature (Puoane et al., 2002; Perissinotto et al., 2002; Wang and Beydoun, 2007). Puoane et al. (2002) observe that although men were taller than women in South Africa, the mean weight in women was greater than that of men. Similarly, Perissinotto et al. (2002) report that the mean values for BMI significantly differed between genders with the BMI being greater in women than in men.

7.4.4 BMI, Food expenditure and Race

Khayelitsha and Mitchells Plain are racially distinct. While Khayelitsha is predominantly black Africans, Mitchells Plain is predominantly Coloured with both race groups making over 95% of their population. The graph below measures the interactions between Age, BMI, and Food Expenditure for the race group. Trends in food expenditure were interrelated. That graph shows a drop in food expenditure for people over the age of 65 years also led to a drop in BMI. This finding is vital especially as people over 65 are most likely to suffer from obesity-related factors such as hypertension, T2D, and other heart conditions (Cecchini et al., 2010). Averett et al. (2014)

recommended that policies targeting obesity in South Africa must consider its racial diversity after finding differentiations in the prevalence of obesity by race.

Figure 7-1 Food expenditure and BMI by Race



Source: Author's Analysis of empirical data

This evidence corroborates previous findings on the rise of obesity worldwide and in South Africa in particular (Puoane et al., 2002; Amstrong et al. 2011; Ng et al. 2014; Mickelsfield et al. 2013; Kruger et al. 2005). Ng (2014) states that about 42% of adults and children suffering from overweight and obesity in sub-Saharan Africa are in South Africa. Thus, from a gender perspective, these results are evidence of weight gain in the study area which needs constructive intervention strategies. Table 7.3 below shows the association between food choices and the BMI of adults in the case study area. The table above provides a descriptive report of the 24H Recall.

Table 7-2 Association of BMI and Food Groups

BMI and food choices					
Food Groups	Underweight	Normal Wgt	Overweight	Obese	Total
Cereals (mealies, maize)	27.18	28.57	29.25	27.44	28.06
White roots (potatoes)	6.67	3.97	6.60	7.62	6.28
Vegetable (spinach, cabbage)	6.67	10.32	9.43	8.23	8.71
Fruits (mango, orange)	3.59	2.38	1.42	3.05	2.63
Fish (including canned fish)	3.08	1.98	0.94	1.22	1.72
Meat (beef, pork, chicken)	19.49	14.68	18.40	13.41	16.01
Legumes (peas, beans, nuts)	2.05	2.38	1.89	2.44	2.23
Milk (yoghurt, cheese)	2.05	5.56	6.60	6.10	5.27
Fat and oil	3.08	2.38	4.25	2.13	2.84
Sweets (sugar)	4.10	7.14	5.19	5.79	5.67
Condiments (spices, pepper)	3.59	6.35	3.30	7.93	5.67
Beverages(tea, coffee)	18.46	14.29	12.74	14.63	14.89

Source: Author's Analysis of empirical data

The result indicates that poor communities in Cape Town could be living on a cereal-based diet. 28% of all food types consumed were cereal-based which include, porridge, maize, and cereal products. Beverages were highly associated with underweight persons in the samples (18.6%). This evidence is consistent with the low dietary diversity that characterized the population of Khayelitsha and Mitchells Plain as shown below under the Dietary Diversity section. While it can be deduced that there is a clear association between energy-dense food and obesity, it cannot be concluded that it leads to causation since the cause of obesity multifaceted. Food rich in micronutrients such as vegetables and fruits as wells as pulse were least consumed during the 24H recall. Fruits and vegetable rank lowest of the food types consumed by obese people 2.62% and vegetable was 8.71%. This evidence supports previous findings showing that South African poor

are suffering from low dietary diversity as well as a high level of cereal-based diets (Labadarios et al., 2011; Du Plooy, et al., 2018).

To assess the relationship between food choices and body mass in the survey, respondents were asked if the food they ate was their usual food. The result showed that overall, 69.90% of the population indicated that the food they ate was their usual food compared to 30.10% who reported that what they ate was not their usual food. However, despite the percentage difference in their response, there was no statistically significant difference in their usual food as our chi2 statistics were not significant at 95% confidence interval (Pearson chi2(11) = 10.0935 P-value = 0.522).

Food Components Derivatives

This section identifies food patterns that were critical in assessing the relationship between food choices and BMI. It used Principal Component Analysis of 12 food groups derived from 36 food types. Using the 12 food groups namely Cereal, White roots, Pulses, Vegetables, Fruits, Meat, Fish, Milk/cheese, Sugar, Fat/Oil, Sausages, and Beverages, we extracted seven components with the minimum Eigenvalue (1). These seven components explain 80% of the variation in the model. The correlation matrix from the sample indicates that there was a sufficient correlation between the variables with correlation coefficient $r>.4$. The higher the absolute value of the component scores the greater the probability of the food contributing to the overall score of the components (Amugsi et al., 2016). It was therefore appropriate to us PCA in the analysis. Cereals, Pulses, and Milk were loaded on Component 1, Fat and Sausages on component 2, Fish and Sugar on Component 3, Vegetables and Beverages on Component 4, Meat, and meat products loaded on Component 5, White Roots loaded on Component 6 and Fruits loaded highly on Component 7. Given this result, it was found that no clear dietary patterns exist in the loading of the component. This seems to suggest that despite the reduction of the 36 food types from the dietary recall, the extraction of seven components does not seem to provide clarity as to people's dietary patterns. However, the first component is evident in the high consumption of cereals and milk food types.

Table 7-3 Association of Food patterns to BMI by Gender

Association of Food patterns to BMI by Gender for Khayelitsha and Mitchells Plain

	Khayelitsha				Mitchells Plain				
Food components	**Men**		**Women**		**Men**		**Women**		**Pooled**
	Coef.	**Sig.**	**Coef.**	**Sig.**	**Coef.**	**Sig.**	**Coef.**	**Sig.**	**Sig.**
Cereals, Pulses Milk	-.70	**0.02**	.16	0.68	-.78	**0.01**	-.71	**0.05**	**0.00**
Fat and Sausage	-.49	0.20	-.69	0.13	-.14	0.69	-1.11	**0.04**	**0.00**
Fish, Sugar	.81	0.10	-.89	0.09	-.28	0.49	-.49	0.32	0.14
Vegetables, Beverages	-.29	0.49	.009	0.98	.91	**0.04**	.94	**0.05**	0.13
Meat	.46	0.38	-.94	**0.14**	-.05	0.92	.64	0.31	0.96
White Roots	1.32	0.08	-.33	0.64	.06	0.90	-.11	0.85	0.48
Fruits	-.90	0.13	-.15	0.82	-.24	0.62	-.18	0.76	**0.02**

Source: Author's Analysis of empirical data

We assess the association of these components by gender to estimate any difference in terms of components weightings. Using OLS regression analysis presented in Table 7.4 below, we found that Component 1= Cereals, Pulses and Milk, for men in Khayelitsha and Mitchells Plain was significantly associated to BMI compared to women at p-value<0.05 significance and at 95% confidence interval. Women in Khayelitsha showed no significant association with BMI resulting from the consumption of foods within the food patterns. Whereas, there was a significant association that a drop in fat levels and sausages will lead to a drop in BMI for women in Mitchells Plain. Generally, however, three of the components/ food patterns showed a significant association with BMI. These were Component 1= Cereals, Pulses and Milk; Component 2= Fat and Sausages, and Component 4= Fruits. From these results, it can be deduced that urban townships in Cape Town could be experiencing a distorted food lifestyle pattern that is contributing to their high weight gain.

7.4.5 Dietary Diversity Score

Steyn and Ochse (2013) accentuate the need for Dietary Diversity based on the premise that no single food type can provide all the needed nutrients. Dietary Diversity in this research was conducted by counting the number of food groups consumed by an individual during the 24Hrs recall. The *mean* DDS *=3.701241 sd=1.738406* which less than the national average of 4. About 45% of adults had a DDS of 3 or less. The results showed that households with 2 persons or less had significantly lower DDS at *coefficient 6.7187 P-value= 0.035* and households with 4 persons and above were found to have low DDS, but not significant. There was a significant difference in the DDS for Khayelitsha and Mitchells Plain Pearson x^2 *=102.9647 P-value = 0.000.* This difference is because Mitchells Plain consumed more food groups with women in Mitchells Plain having a higher average of DDS compared to women in Khayelitsha. However, the study did find a significant difference in DD by gender. Other studies have shown that the majority of South Africans eat low in DDS (Labadarios et al. 2011), and this research corroborates such findings.

7.4.6 Eating Lifestyle

One of the key indicators used in this study to investigate food choices and BMI was the eating habit or lifestyles of the respondent. About 57% of respondents ate fried food out of home at least once a week, while about 39% indicated eat fried food at home at least once a week. Besides, 46% of respondents did not remove chicken skin before eating chicken whereas, 35% do not remove any visible fat from any fleshy food types. Our findings showed a decrease in BMI when participants at the 75th percentile eat fast food once a month. This indicates that a drop in fast food consumption significantly reduces BMI at *p-value 0.042.* This evidence suggests that eating lifestyle could contribute significantly to weight loss or weight gain.

These findings resonate with a study done by Sedibe et al. (2014) in Soweto which revealed that the consumption of unhealthy products in communities was mainly related to price and issues of accessibility. The study revealed that the participant's diets consisted of foods high in fats and

limited fruit and vegetable consumption (Sedibe et al., 2014). This is not unusual as other studies argue that when faced with economic constraints the buyer will purchase foods that will fit into their budget (Tanumihardjo et al., 2007).

7.4.7 Multivariate Quantile Regression Analysis

Appendix 2 we present the multivariate analysis of the association of BMI, Sociodemographic indicators, Eating lifestyle of participants, and BMI. The association of sociodemographic factors was generally not significantly associated with BMI. However, at the 5^{th} and 25^{th} percentiles, an increase in one year of participants could contribute to reducing their chances of being overweight or obese at *p-value<0.05*. Inversely, this is an indication of stunting amongst adults. Women exhibit an urge for weight gain over men and this result provides evidence to the fact. Compared to men, women showed a positive association with BMI at the 25^{th} percentile with a *p-value of 0.022.*

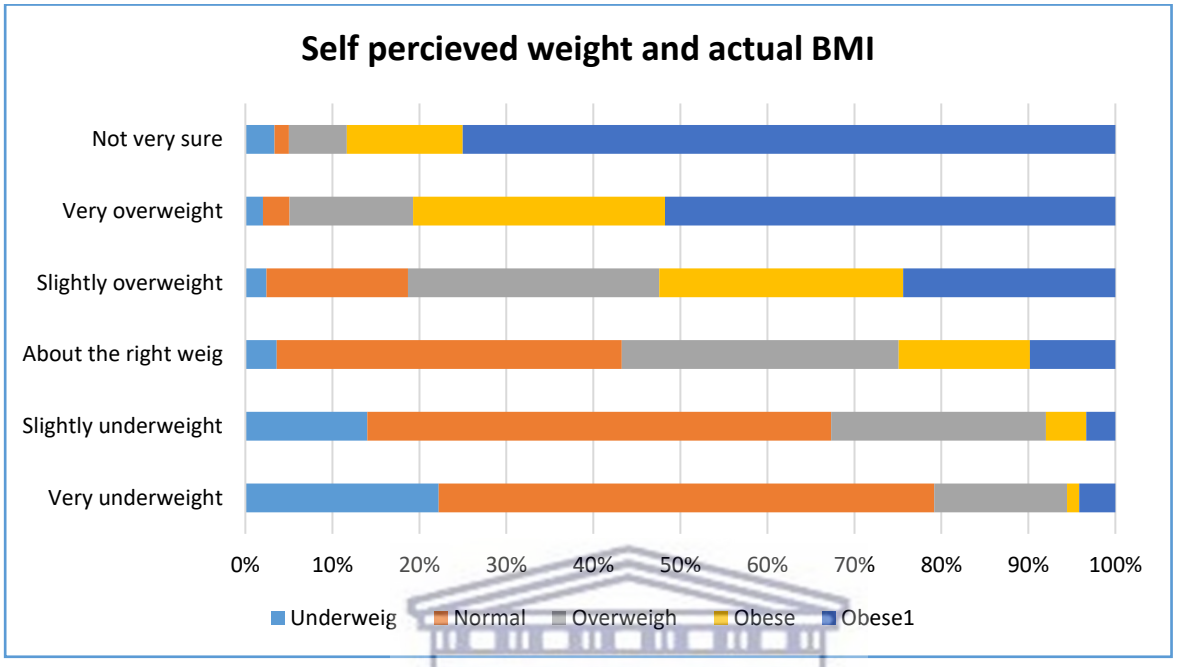
This positive association was consistent from the 5^{th} percentile to the 50^{th} percentile by looking at the coefficients. Given the importance of education, people with no formal education make up 11% of the sample. Those with the highest education being primary were 25% and 54% of respondents had secondary education as their highest education. It was found that people with tertiary qualifications of about 4%. BMI was positively associated with tertiary qualification and primary education at the 75^{th} percentile with a *p-value <0.05.* Educating people on the risk factors of obesity at all levels of education must be emphasized.

7.5 Weight management practice

Weight management practice was used to assess the level of weight management carried out in the population (Jensen et al., 2014). The objective was to investigate how people in urban peripheries undertake weight management. It is already stated in this thesis how people perceive their body size. There were clear discrepancies between perceive weight and actual BMI. What was most

interesting was the fact that the majority of those who indicated that they were not sure also showed that they either overweight or obese.

Figure 7-2 Perceived and actual weight comparison



Source: Author's Analysis of empirical data

The self-perceived weight or body size has been used to measure the overall wellness of a population (Majee et al., 2019). Self-perception of health is a subjective indicator of the global health wellness of an individual or a population. Measuring the population's perception of their health status or mental health conditions helps in identifying problems and prospects in managing population health risk. Some studies have found a disproportionate Self-perceived health status for men and women (Porto et al., 2016; and Johanson, 2009). The results indicate that people in urban peripheries have a sense of what their health status is.

Given the high level of obesity in the study area with about 60% of the population being overweight and obese combined. The weight perception above established the fact that people are likely to have some level of perception of their weight gain or weight loss. However, it is not

known what poor communities do to manage weight gain. Data was collected measuring the weight management of the population.

Table 7-4 Weight management practice

Weight management practice					
	Never	**Seldom**	**Sometimes**	**Often**	**Always**
Gym Workout	1,429 (80.73%)	118(6.6%)	81(4.58%)	80 (4.52%)	62 (3.50%)
Walk to Shop	302 (17.2%)	291 (16.5%)	410 (23.3%)	336 (19.16%)	415 (23.66%)
Swimming	1,218 (68.4%)	268(15.0%)	169 (9.4%)	78 (4.38%)	47 (2.64%)
Dancing	985 (55.3%)	170(9.5%)	269 (15.1%)	194 (10.91%)	161 (9.05%)
Running	1,275 (71.8%)	121(6.8%)	138 (7.7%)	105 (5.92%)	135 (7.61%)
Light Cleaning	1,275 (71.8%)	121(6.8%)	138 (7.7%)	105 (5.92%)	135 (7.61%)
Jumping Rope	1,498 (84.9%)	63(3.5%)	71 (4.03%)	70 (3.97%)	61 (3.46%)

Source: Author's Analysis of empirical data

Weight management was estimated using seven key variables that could potentially contribute to weight management. From the result, 80% of the population has never been to the gym, physical exercise through walking to the shop was 23%. Just about 17% of the population indicated have never walk to shop, 9% seldom walk to shop, and 4% often walk to shop. About 45% of the population use dancing as weight management practice however, just 2% always dance to manage to weigh. The evidence suggests that urban peripheral communities may not be aware of the risk of obesity and that concerted and personal efforts need to be made to correct their perception of the disease.

7.5.1

Binary Logistic Regression Modelling for Weight management practices

A binary logistic regression model was undertaken to assess the relationship between being overweight and obese with weight management practices. The outcome variable is dichotomous, where overweight and obese takes the value of '1' and not overweight and obese takes the value '0'. Results indicated that three of the weight management variables: walking to shop, running and light cleaning and using jumping rope, were significantly related to not being overweight and

obese. Table 7.6 showed that for Khayelitsha, participants who use Running, Light Cleaning, and Jumping Rope had significant odd ratios associated with odds of not being overweight or having their BMI drop because of their weight management practice. Results in Mitchells Plain show that only walking to shop was significantly related to the odds of being overweight and obese. The evidence suggests that an increase in physical activities such as gyming, running, swimming, jumping could make a significant contribution to the fight against obesity in South Africa. Kamaruddin et al. (2014) applied a logistic model to understand the influence of obesity in a family environment using a binary out variable BMI.

Table 7-5 measuring obesity weight management

Logistic regression odd ratios with dependent variable measuring obesity weight management												
	The two population				**Khayelitsha**				**Mitchells Plain**			
	odds	**Std. Err.**	**[95% Conf. Interval]**		**odds**	**Std. Err.**	**[95% Conf. Interval]**		**Odds**	**Std. Err.**		**[95% Conf. Interval]**
Gym Workout	0.90	0.06	0.81	1.01	0.90	.08	.70	1.16	.89	.10	.67	1.19
Walk to Shop	1.12**	0.05	1.05	1.22	0.98	.08	.79	1.21	1.20**	.07	1.01	1.42
Swimming	0.88	0.06	0.77	1.00	0.82	.15	.51	1.32	.91	.08	.72	1.16
Dancing	0.97	0.04	0.89	1.05	0.95	.07	.78	1.16	.97	.06	.82	1.15
Running	0.75**	0.05	0.66	.847	0.65**	.07	.49	.874	.83	.08	.65	1.07
Light Cleaning	1.16**	0.06	1.06	1.27	1.39**	.13	1.08	1.80	1.04	.07	.87	1.24
Jumping Rope	1.06	0.10	0.90	1.24	1.39**	.20	.95	2.02	.85	.10	.61	1.18
**Significant at 0.01, *Significant at 0.05,												

Source: Author's Analysis of empirical data

The use of logistic regression analysis to examine weight management practices of people who do not have access to weight management resources was helpful to understand how local communities especially people formerly disadvantage is managing their body weight. The model develops the log odds of the dichotomous outcome variable, used as a linear combination of the predictor variables. It is evident from the results in Table7.6 that people who do not have access to the gym

are likely not going to lose weight. Similarly, people who lack access to swimming facilities were likely not going to lose weight. This is because access to the gym and swimming pools are rear in the study area. It also indicates that encouraging physical exercise such as running, skipping rope, walking will significantly change the odds of being overweight and obese.

Lifestyle weight management practices are therapeutic requirements as an alternative to medication and surgical procedures. The US National Institutes of Health has identified physical activity, routine dietary interventions, and behavioural change as critical nonmedical therapies for weight management (Jensen et al., 2014). However, maintaining a weight loss through these procedures especially for poor households is a double challenge (McCafferty et al., 2020). This evidences in the Khayelitsha and Mitchells Plain leads to the conclusion that providing communities with weight management facilities could significantly reduce overweight and obesity in peri-urban townships in Cape Town.

7.6 Conclusion

The chapter identified the association between Body Mass Index (BMI) concerning people's food choices and socio-demographic characteristics of people living in Khayelitsha and Mitchells Plain in Cape Town. The results are evidence that more than 60% of the population sampled were overweight and obese. The results portray a strong indication of the risk of an increase in overweight and obesity in urban areas. It also indicates the risk of NCDs amongst poor urban peripheral dwellers. In addition, the growing number of overweight and obesity is likely going to impact governments' public spending on health care.

Women continue to show higher prevalence incidences compared to men thus indicating the need for a possible intervention mechanism that aims at reducing weight gain for women in particular. This proposed that interventions that target specific groups as a measure to address problems of nutrition and obesity in South Africa

The food choices people living in the two Areas were largely cereal-based. There is evidence of low consumption of vegetables and fruits which are rich in micronutrients. The root cause of the increased prevalence of overweight and obesity amongst adults is multidimensional and needs continuous multidimensional approaches to underpin the key factors driving weight gain in Cape Town's urban peripheral township especially in urban peripheral townships. Despite evidence of food choices in this study contributing to weight gain, the results are insufficient and inconclusive. This study found evidence of poor dietary diversity and eating lifestyle to be contributing to weight gain. The majority of households are not only financially poor but exhibits dietary poverty. Dietary patterns were found to be inconsistent and somewhat distorted and making it difficult to identify a clear pattern of whether food choices were completely cereal-based or protein-based. This evidence suggests that these communities, the majority of whom depend on social grants cannot afford food pattern that is evidence of a balanced diet.

Price is often reported as a barrier to the purchase and consumption of healthy foods. *Hence, it is recommended that* strategies that increase incentives for purchasing healthier food options be pursued. Consumer awareness and programs that focus on reducing the risk of obesity needs to be put in place in poor communities to address the problem of obesity. Also, as discussed in this study, to prevent obesity, the multi-sectoral population-based action is required, targeting the most vulnerable group of people. In the next chapter, an analysis of children's BMI and eating habits are presented. The chapter forms part of the analysis of children's rights as contemplated in the Children's Act 38 of 2005 and the Convention on the Rights of the Child 1989.

Chapter 8
EATING AWAY FROM HOME: CHILDREN AT RISK OF UNHEALTHY FOOD

8.1 Introduction

This chapter evaluates the food choices of children and attempts to find a correlation between food choices and body mass index. The chapter starts with an overview of the poverty and inequality in South Africa and its association with child food poverty dynamics. The chapter highlights some of the factors influencing children's food choices and test this phenomenon by statistically analysing the three main sources of children's foods. It triangulates the food children eat at home, what children buy at school and what parents give children in the lunch boxes when going to school. The chapter is a response to one of the key research questions in identifying the kind of food children eat at home, at school, and on their way to and from school. The object was to identify whether the food children are given at home or school if it is in the Best Interest of the Child (BIC).

In addition, it also responds to identify what kinds of food children eat away from home without parental control and what are the potential risk. A brief demographic profile of children is presented in terms of age, gender, number of children in the households, as well as the differences in the two study areas-Khayelitsha and Mitchells Plain. It is important to note that since the study areas are racially divided as stated in chapter one, Khayelitsha is predominantly Black Africans while Mitchells Plain is predominantly Coloured. This helps in our understanding of the social and cultural context in which children are brought up and whether there are any differences in children's food choices based on their cultural and social backgrounds.

South African Children's Act 38 defines a child as any person 18years and below. This chapter, therefore, focused on the child data to the child questionnaire. These questions were limited to children 5-11years old; however, parents or caregivers were allowed to assist the children where appropriate. The objective was to track the eating habits of children in primary school. This chapter is particularly relevant for paediatrics, nutritionist, and policymakers in South Africa especially concerning designing programs to address hunger in poor communities and those designing School Feeding Programmes. One of the limitations of the study is that it could not compare the food choices of children attending school and none school-going children.

8.1.1 Background

South Africa's dietary pattern is changing rapidly as more of the country is becoming urbanised. Over 65% of South Africa's population now lives in urban towns and cities (Dinbabo et al., 2017). The population of children in urban townships and cities has grown significantly. (Hall and Sambu, 2015) states that 19% of South Africa's children live in Gauteng province and 10% in the Western Cape Province which are largely metropolitan provinces. This transition from rural to urban lifestyle is impacting on the social and economic and health of the population (Sedibe et al., 2014).

South Africa is one of Africa's fastest-growing economies, yet high levels of poverty, inequality, and poor nutritional conditions characterised the majority of poor households, especially Black Africans. Women and children are the most vulnerable groups trapped in what has become intergenerational poverty and inequality. Several studies on poverty and inequality in South Africa have identified South Africa's historical backgrounds- the impact of apartheid (Leibbrandt et al., 2007; May and Govender, 1998), as one of the major causes of poverty and inequality, in addition to the failure of state institutions in post-apartheid South Africa (David et al., 2018). As poverty continues to be resilient, so too is inequality (Jamieson et al., 2017).

High levels of income inequality, gender disparity, and low levels of education are pervasive (Adams and Mahomed, 2018).

South Africa's population was estimated at 55 million in 2011 (Statistics South Africa, 2015). This middle-income country has about a third of its population (62%) living in urban areas. Cape Town and Johannesburg are large metropolitan cities and the highest recipients of internal migrants (Dinbabo et al. 2017). As urbanisation increases, larger informal settlements are sprouting in the urban peripheries leading to changing social lifestyles (Kirsten, 2012). The population of South Africa's children aged (0-18years) continues to grow (Hall and Sambu, 2015). According to Statistics South Africa (2015) children, less than 18 years accounted for over 35% of South Africa's total population. In 2010, over 10million children were living under the poverty line down from 14 million in the year 2000 (SAHRC and UNICEF, 2014). A recent report on the state of poverty shows that 30.4million South Africans are living below the poverty line, up from 27.3million in 2011(Statistics South Africa, 2017).

Poverty alleviation spending is one of the government strategies to mitigate the impact of poverty. The government of South Africa pays over R17 million in social support every month (Kelly, 2016). Furthermore, despite increasing investment in social grants to overcome the scourge of poverty, many children remained trapped in poverty (Hall, 2013 and Kelly, 2016). The inability of poor households to access the labour market is described as the main driver of inequality in South Africa (Finn 2014).

The result of poverty and inequality in the food choices of children and access to basic social needs is evident in many studies in the subject area (Kroll, 2016; Beets et al., 2014; Abdollahi et al., 2011; Hall et al., 2009; Dieden and Gustafsson, 2003). However, little is known on what informs children's choices of food despite living in abject poverty in a highly unequal social space. Some studies have found evidence of adolescence in Cape Town were at risk of

unhealthy food choices (Campbell et al., 2018; Temple et al., 2006). Food poverty in South Africa affects children the most. Children living in poor communities and from poor households are the most affected. The effects of poverty and inequality have a significant bearing on children's access to quality food and nutrition.

8.1.2 Poverty and Inequality in South Africa

The nature of poverty in South Africa is endemic and as postulated by May (1998) it is near impossible to expect a complete eradication. For this reason, the topic of poverty and inequality has remained a national keyword. Poverty and inequality are the legacies of South Africa's apartheid era (Leibbrandt et al., 2007; Mayo, 1998). It is pervasive despite numerous government policies such as the Child Support Grant, the Old age grant, and the Disability Grant to try to overcome the scourge of poverty and inequality. The Child Support Grant currently supports more than 12million children and has contributed significantly to poverty reduction for poor households (Dinbabo, 2011a; Lund, 2011b; May and Govender, 1998; Patel and Hochfeld, 2011). Hall (2010) states that 66% of African children were living in poor households, 30% of Coloured, and 8% of Indians. This high level of income inequality is what drives poverty in South Africa. In a recent analysis of spatial poverty in South Africa, David, et al. (2018) found that 55% of South Africans are income poor, using the upper bound threshold of R779 p/m. This widespread distribution of poverty does not, however, provide an answer to the poverty question in South Africa.

8.1.3 Child Poverty in South Africa

Child poverty in South Africa varies by geographical location and household demographics. The poorest children live in rural areas and face multiple challenges in terms of access to food, education, and health care. Hall and Sambu, (2015) reported that about 68% of children in South Africa live in the poorest 40% of households. Child poverty is a common concept in

South Africa but its dimensions are complex especially if seen from a one-angle perspective. There is therefore no clear cut definition of child poverty globally. In trying to contextualise child poverty, questions have arisen as to how it should be measured, how to distinguish it from adult poverty and these questions have often led to endless arguments in academic papers and policy debates. Measuring poverty using the poverty line index is biased and largely underestimates the level of poverty at household levels (Gordon et al., 2003).

> Children living in poverty are deprived of nutrition, water and sanitation facilities, access to basic health-care services, shelter, education, participation and protection, and that while a severe lack of goods and services hurts every human being, it is most threatening and harmful to children, leaving them unable to enjoy their rights, to reach their full potential and to participate as full members of the society (UNICEF, 2005, P.1)

Child poverty exists when access to finances, material, and supports is inaccessible to enable the child to live and develop a mentally and socially healthy life. Children who experience poverty and limited their academic social, moral, and spiritual development (Minujin et al. (2006). Indeed, poor children tend to experience one form of deprivation in later stage life and numerous pieces of evidences accede to these facts. In South Africa in particular, children from poor background have been found to experience deprivation in the cause of life (Corak, 2004; White, & Masset, 2002).

The example of (Boyden et al. (2019) tracing childhood poverty is disturbing. The study is a replica of child poverty in South African. Poor children in South Africa are in the poorest schools with a lack of resources such as water and sanitation. Despite South Africa's economic growth since after the end of apartheid, the inequality gap has only widened. Poor children are the most disadvantaged. Indeed, Boyden states that poverty is reinforced where people are already disadvantaged and discriminated based on their location, gender, and in this context

their skin color. Children whose parents have no education are unemployed are likely to drop out of school or have poor education. Poor children experience the worst services, are at risk of malnutrition, hunger, and obesity(Boyden et al., 2019; Fransman and Yu, 2019; Jonah et al., 2018).

8.1.4 Food poverty

Food poverty is a developing concept within the poverty and inequality discuss in South Africa. Statistics in 1995 showed that South Africa suffered food poverty at a rate of 47% (Rose and Charlton, 2001). Darmon, Ferguson & Briend (2002) observed that food poverty is the result of economic constraints on households. This has high bearings on food choices and the health of poor communities living in urban areas. According to Jonah and May (2019) found evidence linking household food insecurity and dwelling type. People living in informal settlements were more likely to be food insecure. Food poverty was identified as one of the fundamental requirements for measuring poverty besides the income and expenditure approach (Laderchi, Saith & Stewart, 2010). Albeit problems with this methodology with regards to what may be adequate among males, may not be replicated among females (Pretorius & Sliwa, 2011), and the limitations of some of these measures, nutritional insecurity remains a major problem in poor communities and affecting particularly women and children.

Pretorius & Sliwa, (2011) found a link between the socio-economic conditions of people living in Soweto-an urban peripheral community in Johannesburg South Africa, to non-communicable heart disease. The lack of adequate financial resources to enable the poor to access variety and quality food was found to be a measure cause for poor nutrition.

Food consumption patterns for many developing nations are changing (Bezerra et al., 2017). Introducing healthy food choices for children has the potential to span into adulthood (Andersen

et al., 2016; Waddingham et al., 2018). In South Africa, these change in dietary patterns is associated with urbanisation and changing dietary habits toward highly processed food in the urban space (Bourne et al., 2002). Moreover, poverty and inequality are key factors of current food insecurity for the majority of the poor. The poor go for food, and not for nutrition when making food choices, and children, in general, are not less likely in their choices. Children living in South Africa's Urban Townships are at risk of eating unhealthy food away from their homes.

Poverty is multidimensional Mtshali, (2018). Measuring food poverty by household income, therefore, limits the scope of assessing food poverty. Rose & Charlton (2001) state that household food poverty occurs when average monthly food spending is less than the cost of a nutritionally adequate low-cost diet. In their research, they found that food poverty rates increased with decreasing income, increasing household size, and among households in rural areas or those headed by females. This evidence is supported by other researchers (Altman et al., 2009; Dinbabo, 2011; Dinbabo et al., 2017; Hall et al., 2009).

Food poverty takes place when members of a household are undernourished. According to Rose & Charlton, (2001), this could lead to household food insecurity which is described as adequate access to quality and quantity of food sufficient to satisfy dietary needs. Though the Integrated Nutrition Plan for South Africa attempts to address some of the challenges of undernutrition, and improvement of quality food types, in Rose & Charlton (2001) perspective such a plan is not comprehensive enough in addressing food poverty and increase the health condition of the poor and in particular children in poor households. This chapter shows that children living in urban peripheral townships in Cape Town are at risk of unhealthy food types.

8.2 Children's nutritional environment

Understanding children's nutritional environment is vital in determining children's food choices. Several factors are associated with children's food choices and these factors are in the first place strongly linked to the parental level of education, environmental interactions, and social-economic status, cultural adaptations, as well as the child's personal cognitive developments. Birch and Fisher (1998) highlighted several factors influencing children's eating habits but emphasised on the critical role parenting plays in this domain. Birch and Fisher state that the food preference of children is an important determinant of children's dietary intake. This is because children are prone to eat what they like and though what may be good for them such as vegetables may not be very attractive or tasteful, thus they tend to leave it out. Below are a few of such key factors influencing children's food choices.

8.2.1 The role of parent and guardians

Parental influence on children's food choice starts with the choice to bread feed or to use formula products which are known to have an immediate impact on children's taste and flavour (Birch et al., 1996; Birch and Fisher, 1998; Jones, 1987; Scott et al., 1997). Parental influence has been largely reported for influencing children's food choices (Campbell et al., 2007; Jilani et al., 2018; Oellingrath et al., 2013). According (Koivisto Hursti, 1999) there is a direct and indirect association between parent's food choices and their child (ren). Given this correlation, parents should be able to make healthy food choices and ensure that children have access to healthy food types. It is also evident that parental motives for healthy food eating patterns as a positive association with children's food choices (Oellingrath et al., 2013). While involving children in their household food choices is known to have a positive impact on children's food choices (Campbell et al., 2007; Jilani et al., 2018; Oellingrath et al., 2013), parental control is limited to home eating. Children are still vulnerable eating away from home.

8.2.2 The effect of television

There is sufficient evidence in the literature on the impact of Television (TV) on people's body mass index. In Harris et al. (2009), TV advert contributes 45% more of children's consumption habits after being exposed to food adverts. Dinbabo, et al. (2017) found a positive association between food advertised on TV and BMI in poor communities in Cape Town. TV watching influences a sedentary lifestyle with mindless eating. Boulos et al. (2012) found that children and adolescents who spent long hours watching TV were susceptible to overweight and obesity. In contemporary South Africa, however, not much is known about the impact of TV on children's eating habits. Temple et al. (2008) found that 55% of food advertised for children's consumption in South Africa were of poor nutritional value.

8.2.3 Community and social influence

Children's food choices are influenced by multiple factors such as social acceptability- which relates to the fact that there is a community attachment or attractiveness to the particular food type; knowledge factor which is people's perception of their health status; pleasure which comes with the cognitive ability of the consumer as well as their versatility (Abdollahi et al., 2011; Koivisto Hursti, 1999; Waddingham et al., 2018). However, most of these studies are limited to children's food choices at household levels.

In a recent study that compared the food choices of adolescents in Cape Town and New Yoke, Campbell, et al. (2018) notes that School Feeding helped improved healthy food choices thus parents and schools were found to have greater influence in the food choices of children. However, these children could not be classified as poor given the income bracket of their household. This shows that children from average housed with parents have a double advantage of parental influence and school influence in their food choices. They defined healthy food

types to be fruits, vegetables, and water while unhealthy food types were classified under sugary, beverages, salty, and high-calorie snack foods.

The Child's School Nutritional Environment

There is limited knowledge about what children eat in the school environment. In South Africa, this is further compounded by poverty and inequality especially for children in urban peripheries Low consumption of fruits and vegetable are identified as one of the top 10 global risk factors for mortality (Ganann et al., 2014). Children are less likely to consume these food types rich in micronutrients. (Nhlapo et al., 2015) showed that meals supplied at schools under the SFP did not always meet the nutritional standards. The need to enhance children's nutritional environment to ensure children's access adequate to nutrition will optimise children's growth. Exposing children to food type poor in nutritional values further exacerbates the risk of unhealthy food. The consequence of undernutrition or overnutrition leads to stunting or obesity (Nhlapo et al., 2015).

8.2.4 Children's eating habits

Poor dietary behaviour impacts on population nutritional status. Poor dietary behaviour is a measure contributor to the increase in obesity and the rapid increase in NCDs amongst black South African (Claasen et al., 2016; Moreno et al., 2008; Ng et al., 2014; Puoane et al., 2002). Research in the context of children and their rational decision to make informed food choices show points to the fact that habits and lifestyle, personality threats, their socioeconomic environment, and cultural background contribute significantly to children's food choices decision making (Dias and Agante, 2011; Douglas, 1998; Holsten et al., 2012; Westenhoefer, 2001).

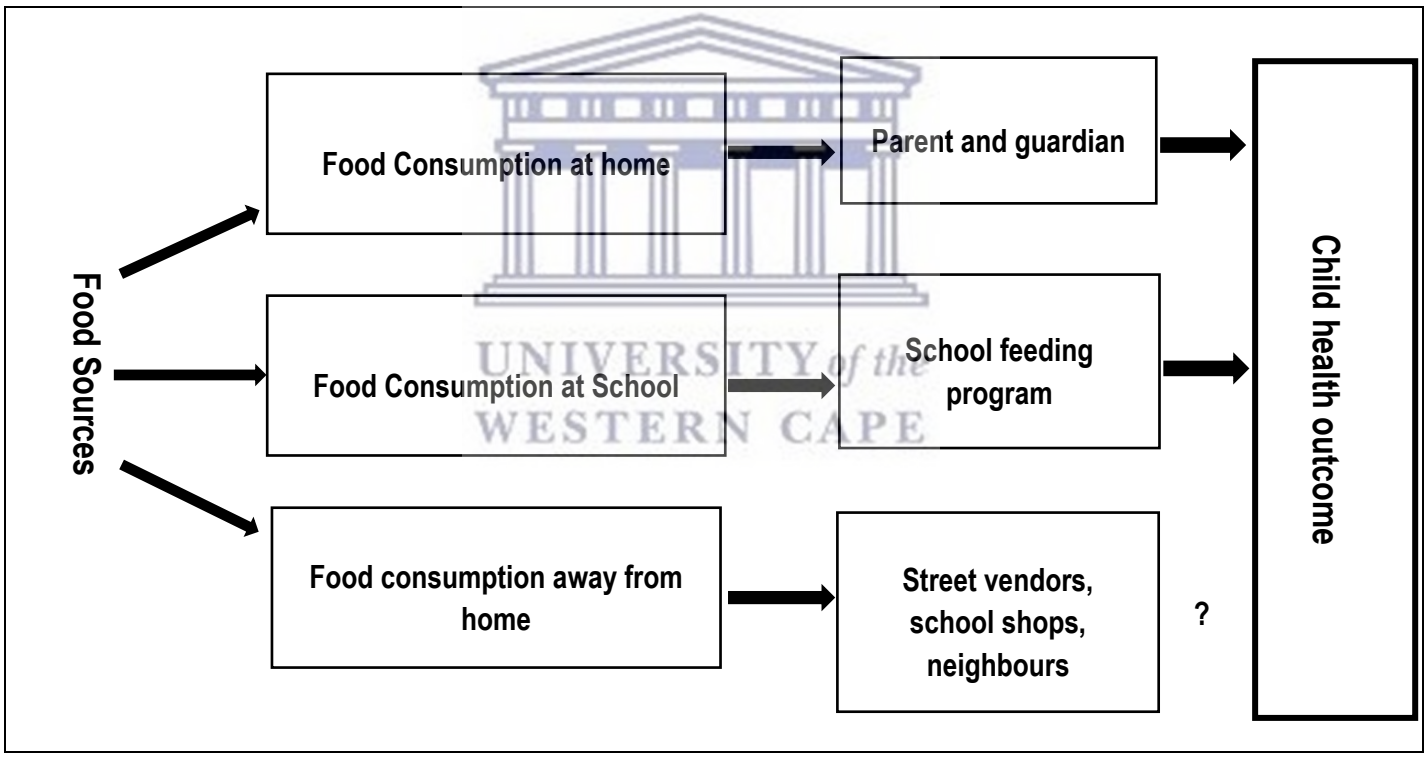
Food habits change with age and time. Besides, food habits change in the location especially from rural to urban areas. Children are not less likely to experience these changes in their life course. Holsten et al. (2012) developed an in-depth analysis of children's food choices within the context of the home and time. Exposure to unknown food to new-borns showed an innate preference for sugar-sweetened foods and a dislike for sour taste foods (Westenhoefer, 2001).

In (Dinbabo et al., 2017) eating habits amongst poor South Africans are sedentary and despite evidence of fruit and vegetable consumption, such was inconsistent. In some areas, about 73% of households consumed fruits on an occasional basis. This low consumption of fruits and vegetables has led to some researchers describing South Africa as characterised with a low intake of fruits and vegetables (Faber et al., 2013; Peltzer and Phaswana-Mafuya, 2012). Fruits and vegetables are high in vitamins and needed to breakdown excess fat in the body. Faber et al. (2013) state that just about 44% of all South Africa's urban dwellers compared to 27% of rural dwellers ate fruit and vegetables in the year 2000. The World Health Organisation (WHO) recommends a daily intake of 5 servings of Fruit and Vegetables (Peltzer and Phaswana-Mafuya, 2012). Dinbabo, et al. (2017) found that people who reported a high frequency of fruit and vegetables were also highly associated with normal weight. This research attempts to close the gap in the literature on the knowledge of the type of food children choose without parental influence. Given that there exists a certain level of control and monitoring at the household level children could be exposed to unhealthy food outside their home where there is no parental control

Figure 7.1 is a summary of the research gap concerning children's food sources. As already stated, there is sufficient evidence in the literature pointing to parental influence on children's eating habits which is both negative and positive. Studies on children's eating habits have highlighted the kinds of food children consume at home, which is the main source of food

coming from the parental decisions. It is also known that children have access to food through the implementation of School Feeding Programmes (SFP) whose source is the government and children make no decision about the food provided. Studies have also shown what children consume at school using the SFP are mere nutritional interventions and are not sustainable. However, not much is known on children's food choices away from home especially in South Africa. Children buy food items to and from school as well as the neighbourhood in which they live. The frequency and the kind of food items are what this research chapter seeks to contribute to the knowledge of children eating habits especially children from urban peripheral townships.

Figure 8-1 Children's food sources



Source: Author's Analysis of empirical data

8.3 Results: Description of the analytical process and findings

All children within the age category were allowed to answer the questions. Children were randomly selected per household. The reference period for all questions was one week. Codes were given to the responses. Binary questions were coded (yes=1, No=0). Other questions with responses of Always/ Sometimes / Never were coded differently. Always/Sometimes=1 and Never=0. We used the Rasch model to analysis the eighteen food types that were self-reported by parent and by the children. The data was transformed to measure the level of difficulty and easiness in making food choices. The purpose of using the Rasch model/ 1PL model was to help triangulate food types from home, child lunch box and food types children buy without parental control. One of the limitations of this study is that due to logistical setbacks, crime as various risk factors associated with the area, some children could not be interviewed since they were at school at the time of the interview and attempting to return to some of these households was practically impossible. Thus, we have parents reporting what children eat at home and what they had in the lunch box but could not interview such children to know what they buy on their own decision.

8.3.1 Demographic analysis

In this section, a large proportion of the results focused on comparing the Khayelitsha and Mitchells Plain townships in Cape Town. The rationale was to first identify if there were any significant differences between the two localities since there was already a clear indication in chapter 5 on the racial divide.

From the population surveyed, there 586 children aged 5 to 11 years. This constitutes 13 % of the sample. About 53% of households have at least one child. Male children were 45% and 55%, female. Children within the age group are most likely to be in school. The results show

that 18% were in Grade R while 69% were already in primary school, which is between Grade 1 and Grade7. About 10% were not attending any form of schooling. The average age of children 5 to 11 years was 7years *sd=2.00*, though the average age for children in the sample was 9years. Girls were on average older than boys. The average age for boys was 7 years, *sd=2.05* while the average age for girls was 8 years, *sd=1.9*. Girls were significantly older than boys at *t= -2.0501* and *p<0.024.* Thus, it can be deduced that girls in the sample of children age 5 to 11 are likely to be older than boys. This is possible because there were more female children in the sample than boys.

Table 8-1 Percentage of children by Gender

% of children by Gender					
Child(ren)	**Khayelitsha N=288**	**Mitchells Plain N=286**	**Pooled N=574**	**X^2**	**P-Value**
Male	121(42.01%)	139 (48.60%)	260 (45.30 %)	2.5131	0.113
Female	167(57.99%)	147 (51.40%)	314 (54.70 %)		

Source: Author's Analysis of empirical data

8.3.2 Household Characteristics of Children

Table 8.2 describes the children's demographic profile. The population of children in South Africa is on the increase and policies that seek the BIC need to be well developed. Planning the future of South Africa's children is planning for the growth of the nation. There were 586 children between the ages of 5 to 11 years old. This form 41% of all children in the sample. In general, the population of children in the sample contributed to 32% of the sample for both areas. This is consistent with Statistics South Africa (2015) report which states that 35% of the population of South Africa are children 18years and less. From the tables below, 5, 7, and 9

years old children fall within the range of 14% while 15% of children were 6 years old and 13.16% were 8 years old children. There was a significant difference between the children's ages the survey site in which they reside. The evidence shows more 5years olds children were found in the household (19.73%) in Khayelitsha and just about 9% in Mitchells Palin with a *P-value of <0.05* significant level. However, the result showed that Mitchells Plain had significantly more 6 years old children than Khayelitsha.

Table 8-2 Children in households

% of children in households					
No. of children in the household	**Khayelitsha N=294**	**Mitchells Plain N=291**	**Pooled N=585**	**X^2**	**P-Value**
1	146(49.66%)	160(54.98%)	306(52.31%)	12.44	**0.006**
2	128(43.54%)	110(37.80%)	238 (40.68%)		
3	12(4.08%)	21(7.22%)	33(5.64%)		
4	8 (2.72%)	0(0.00%)	8(1.37%		
% of children per age category					
Age in years	**Khayelitsha N=294**	**Mitchells Plain N=291**	**Pooled N=585**		
5	58(19.73%)	28(9.62%)	86(14.70%)		
6	39(13.27%)	53(18.21v)	92(15.73%)		
7	44(14.97%)	39(13.40%)	83(14.19 %)	14.5	**0.024**
8	38(12.93%)	39(13.40%)	77(13.16 %)		
9	41(13.95%)	45(15.46%)	86(14.70%)		
10	36(12.24%)	47(16.15%)	83(14.19 %)		
11	38(12.93%)	40(13.75%)	78(13.33 %)		

Source: Author's Analysis of empirical data

The distribution of children between the two study areas did show a significant difference in the ages of children both within and between the study sites. The table above showed that 49.66% of households in Khayelitsha have one child who was between 5 to 11years old in the household compared to 54.98% in Mitchells Plain. While there were more households with one child in Mitchells Plain, 43.54% of households in Khayelitsha had two children in the household compared to 37.80% in Mitchells Plain. The number of children in a household, their gender, and age, has a direct and indirect effect on their food choices decision-making cognately. Children have been found to make daily choices and their ability to make decisions needs to be developed through education and training. Demirtaş and Sucuoğlu (2009) state that early childhood decision making life skills is important to help children develop decision-making skills even from the age of 4. Such life skills in food choices will greatly enhance children's cognitive ability to understand their food environment.

8.3.3 Income as a motivating factor

Income is a key determinant of children's choice of food. However, given that these communities are plagued with high levels of poverty and inequality the main source of income for many households is the CSG. About 44% of households were recipients of the CSG (CSG) and 48% of children in the sample come from households that are recipients of CSG. A detailed description of household income is presented in chapter six above. Many studies have underscored the role of the child support grant in South Africa in child poverty alleviation. Others have highlighted the contribution of the child support grant in food security for poor households in South Africa (d'Agostino et al., 2018; Patel et al., 2017). The child support grant has also made a significant contribution to the education of the child but most of these studies

have largely focused on the school fees and books or school material as well as school transport (Lund, 2011).

It has been a challenge for many researchers, government and stakeholders to decipher the link between household food security and CSG (Leila Patel and Hochfeld, 2011; Sedibe et al., 2014). These challenges stem from the lack of appropriate methodology to measure how the CSG impacts on children's food security or household food security. This study acknowledges the eminent challenge of investigating if the money parents given their children, is actually from the CSG. However, this study shows that attempting such an investigation could lead to a better understanding of children's rational behaviour in making food choices when given money. It is important to investigate how many children who benefit from the CSG use it to buy food at school or on their way to school. This research did not, however, assess how parents make use of the CSG but highlight the above issues as critical gaps for further research.

Table 8-3 Association of CSG and child buying food

		Khayelitsha	**Mitchells Plain**	**Total**	**Coeffi.**	**P-Values**
Child buys food	Yes	105(43.21%)	138(56.79%)	243 (100%)		
	No	42(38.18%)	68(61.82%)	110 (100%)	0.7878	0.375
	Total	147(41.64%)	206(58.36%)	353 (100%)		
A Child received CSG in the house	Yes	388(64.7%)	212(35.3%)	600 (100%)		
	No	115(35.5%)	209(64.5%)	324 (100%)	72.1898	**0.000**
	Total	503(54.4%)	421(45.5%)	924 (100%)		
A Child received CSG in the house	Yes	74 (70.4%)	31 (29.5%)	105 (100%)		
	No	30 (75%)	10 (25%)	40 (100 %)		
And Child buys food	Total	104 (71.7%)	41(28.2%)	145 (100%)	0.2923	0.589

Source: Author's Analysis of empirical data

Table 8.3 presents the association between children buying food and CSG. The difference between Khayelitsha and Mitchells Plain is presented using the Chi-square test of difference.

The results show that despite more children and households in Khayelitsha being recipients of the CSG, there was no significant difference between the study areas in terms of the association of households and children who receive the CSG and buying of food. However, the evidence shows that more households with children in Khayelitsha received CSG and this was significantly different from households with children in Mitchells Plain. This evidence contributes to our understanding of the inequality in South Africa. Despite the two study areas having similar characteristics, there exist a higher dependence on CSG in Khayelitsha which is predominantly Black Africans.

8.4 Motivations for child food choices

Children buying food on their way to school shops are indirectly or directly motivated by their parents. There is a strong and positive association between parents giving money to their children to take to school and the children buying food. Children were asked if they buy food at school or on their way to school and whether their parents give them money for the purpose. The amount of money was not material at this point as the study aimed at looking at some of the motivations for children's food choices outside their homes. The result indicates that 68% of children reported that they buy food at school or on their way to school. Over 83% stated that their parents gave money to take to school. There was a significant association between children buying food and parents giving money at X^2 *91.4643,* $P <= 0.000$. Thus, though children have a rationale choice to make in terms of what they buy, these are motivated by what their parents give them. We assess in the table below the items that children buy at school or out of school.

8.4.1 The influence of Parent and Guardians

Parents have a critical role to play in determining the food choices of their children and in ensuring the BIC. The Convention on the Rights of the Child (CRC) (this is discussed in detail in chapter 9) already established the burden of care on parents. Given that parents are the main drivers of children's food choices, it is important to understand how parents see their children and what concerns they have in their attempt to protect the health of the child. It is important to note that the role of the State in child protection is only triggered once there are issues with the household environment which may involve divorce, poverty, or in the case of disaster. Table 8.4 looks at parents' concerns for the child. But first, the results showed that 68% of parents with children in the sample reported that they were concerned about the child. If a parent or caregiver responded to the question affirmatively, then they were asked to state the kinds of concern they had had for the child. These concerns were grouped into these categories as presented below.

Table 8-4 Parental Concern for the child

Parental Concerns		
Concerns	N=196	%
Child losing weight	35	18%
Child gaining weight	19	10%
Child eats too little	18	9%
Child skip meals	17	9%
Child eats candies and chips	70	36%
Child eats too frequently	20	10%
Child likes fatty food	17	9%
Others	7	4%

Source: Author's Analysis of empirical data

The sample here represents the number of children whose parents responded to the question about concerns for the child. The results show that 36% of parents who responded were concerned that their child or children eat a lot of candies and chips or crisps. About 18% were concerned about the child's weight but this concern was about the child losing weight while 10% 0f the parents were concerns that the child was gaining weight. It appears that there was not much concern when the child's weight increases. This indicative of the fact that parents may not necessarily be alarmed when the child gains weight compared to when the child loses weight. When parents do not show concern about the weight of the child, they are likely not to be concerned about the food the child eats. However, this result shows that parents may be concerned about what the child eats not to protect the child from the effects of food types that could impact negatively on the child's health.

Studies have shown that parents have a high influence on what the child eats and this is not limited to children from a poor background (Campbell et al., 2007; Jilani et al., 2018; Oellingrath et al., 2013).

Parent influences on children's food choices can be direct and indirect (Koivisto Hursti, 1999). Other studies have shown that parental restriction was more associated with parental concerns compared to parental pressure and child avoidance to eat (Sorjonen, et al., 2016). While involving children in their household food choices is known to have a positive impact on children's food choices (Campbell et al., 2007; Jilani et al., 2018; Oellingrath et al., 2013), parental control is limited to home eating. Children are still vulnerable eating away from home. Thus, these results suggest that addressing children's food choices and correcting children's food behaviour, parents' perception and influence must be addressed alongside.

8.4.2 The influence of television

There is sufficient evidence in the literature on the impact of Television (TV) on people's body mass index. In Harris et al. (2009), TV advert contributes 45% more of children's consumption habits after being exposed to food adverts. Dinbabo, et al. (2017) found a positive association between food advertised on TV and BMI in poor communities in Cape Town. TV watching influences a sedentary lifestyle with mindless eating. Boulos et al. (2012) found that children and adolescents who spent long hours watching TV were susceptible to overweight and obesity. In contemporary South Africa, however, not much is known about the impact of TV on children's eating habits. Temple et al. (2008) found that 55% of food advertised for children's consumption in South Africa were of poor nutritional value.

8.4.3 Food Consumption habits

Food consumption habit was used to identify the eating habit of the children in terms of frequency of eating healthy or unhealthy food types. In this section, the difference between the study areas is analysed using the chi-square test. Table 8.4 below shows that 37.57% of children in Khayelitsha compared to 62.43% in Mitchells Plain frequently eat vegetables. The result was similar for fruits and water intake. Despite children's frequency being high in Mitchells plain, there was no significant difference between the two areas concerning water intake and frequency of removing chicken skin before eating. The result however shows that there is a significant difference in the eating habits of children from different racial groups and communities in Cape Town. The rationale for this distinction in the eating lifestyle is that children according to the City of Cape Town (2016) socioeconomic profile report, 63% of the population of both Khayelitsha/Mitchells Plain district fall under the lower income bracket of the City of Cape (City of Cape, 2016).

From an inferential perspective, using the Chi-Square test, the results Table 8.5 showed that there was evidence to believe that the sample population of children was significantly different in their eating habits at $p<0.05$. Children from Mitchells Plain tend to have greater access to fruit, and vegetables compared to children from Khayelitsha. Similarly, children from Mitchells Plain also have greater exposure to fried food away from home and at home as well as meat products. Just water intake of the children was the same for both populations

Table 8-5 Food Consumption habits of Children

Food Consumption habit of Children				
	Khayelitsha	**Mitchells Plain**	**X^2**	**P-Value**
Frequency of eating Fruits	37.5%	62.4%	11.3599	0.010
Frequency of eating vegetable	37.3%	62.6%	23.6038	0.000
Frequency of Water intake	38.7%	61.2%	2.3084	0.679
Frequency of eating Fried food away from home	39.5%	60.4%	20.9086	0.000
Frequency of eating Fried food at home	38.3%	61.6%	18.8019	0.001
Frequency of removing Fat from meat	41.2%	58.7%	14.1583	0.015
Frequency of removing Chicken Skin	41.0%	58.9%	6.9407	0.139

significant level P <0.05*

Source: Author's Analysis of empirical data

In Chapter 6, it is shown that household income in Mitchells Plain earns more that households in Khayelitsha. Besides, food expenditure was greater for Mitchells Plain. This evidence suggests that though poverty and inequality persist in South Africa, policies that turn to group communities on an equal base are no longer relevant in South Africa. Policies must be designed to address poverty, especially amongst the African population. In addition, African children

need to be given a special status in policy design and implementation without which more African children will live in poverty and malnutrition for the rest of their lives. Table 8.5 continues to show a significant difference in the food frequency table but for two food types water intake and chicken skin removal. Children in the study areas are less likely to remove chicken skin when eating children.

8.4.4 Food choices of children at home, at school and away from home

This section analysis the food choices or food preferences of children during the 24h recall, the food packed in the lunch boxes of children, and the type of food children by when given money by their parents. The later represents the food choice of children without parental influences.

Table 8.6 below shows the various food items that children buy on the one hand and what children ate at home during the 24h recall. In food type A, Children indicated the food bought while at school or on their way to school. This was an open-ended question to allow children to state their food types. The assumption was that given children money to buy food, the average child will make the choices below. The food types were categorised these food types into three: carbohydrate related; Surgery products, Protein related, fruits, and green vegetables. In food type A, 58% of the food types children buy was carbohydrate, 35% were high in sugar while the fruit was just 1.9% cumulatively. Crisp was by far the dominant food type at 28% and sweets were 21%.

Table 8-6 Food types consumed by children

Food Consumption of Children Khayelitsha and Mitchells Plain									
Food types children buy at school or out of school				**Food types Consumed in a 24h Recall**			**Food types in the lunch box**		
Food types A	**N=321**	**%**		**Food types B**	**N=467**	**%**	**Food types C**	**N=1024**	
Chips (Fried potato)	39	12.15	58%	Cereals (Mealies, rice, crisps)	161	4%	Chips (Fried potato)	36	4%
Crips (Lays, samba chips)	91	28.35		White roots (Potatoes)	25	2%	Crips (Lays, chips)	19	1,9%
Bread	5	1.56		Vegetables (Spinaches)	41	33%	Bread	**342**	33,4%
Amagwenya/Vatkoek	13	4.05		Fruit (Mango, Orange)	8	0%	Amagwenya	3	0,3%
Biscuits (Wafers)	10	3.12		Fish and Fish Products	8	1%	Biscuits (Wafers)	8	0,8%
Hotdog role	17	5.30		Flesh meat (Beef, chicken)	61	1%	Hotdog role	7	0,7%
Cakes (Cupcakes)	7	2.18		OtherProtein (egg, Polonies)	24	0%	Cakes (Cupcakes)	4	0,4%
Pie	4	1.25		Beans peanut butter	8	0%	Pie	2	0,2%
Noodles	1	0.31		Milk &Milk products	23	0%	Pizza	1	0,1%

Chicken	6	1.87	7.3%	Oil fat (butter)	12	3%	Eggs	27	2,6%
Poloney	6	1.87		Candies (Sweets, lollipops)	3	1%	Chicken	8	0,8%
Yoghurt	3	0.93				15%	Polony	158	15,4%
Fruits	6	1.87	1.9	Spices	18	8%	Fruits	82	8,0%
Lollipops	21	6.54	35.2%	Beverage (coffee tea cool drink)	44	0%	Lollipops	2	0,2%
Suckers/Ice lolly	6	1.87		Sugar and sugar Products (Jam)	21	15%	Chees	154	15,0%
Sweets	68	21.18		Soups	10	1%	Sweets	7	0,7%
Drink-a-pop	18	5.61				11%	Yoghurt	53	10,8%
Carbohydrate		58.3%				40%			41%
sugary products		35%,				5.10%			0.9%
Protein related		7.3%				26.55%			18.8%
Fruit /vegetables		1.9%				10%			8.8%
Dairy and others		0.9%				19%			26%

Source: Author's Analysis of empirical data

For food types B (eaten at home), 40% was carbohydrate related to the food eaten at home, and 42% of food carried to school in a lunch box. Surgery products 35% for food children buy. This evidence, suggests that with the already cereal-based diet at home, children are at risk of unhealthy food choices. In addition, about 80% of children stated that their water bottles were sometimes filled with sugar-sweetened drinks. Investigating whether the food children take in their lunch boxes was their usual food, about 33% of parents reported that the food the child takes to school was Always the food in the lunch box of the child, about 19% of the time it was ***Often*** the food in the lunch box, while 17% of the time it was ***Sometimes*** and only 5% and 11% reported it was ***Seldom*** and ***Never*** respectively, the food in the lunch box.

Table 8.6 shows that the most common products purchased were carbohydrate and sugar-related products. The Table compares the food purchased by children, the food taken in the lunchbox, and the food eaten at home and reported in the 24h dietary recall. It was necessary to interrogate what parents or caregivers put in the children's lunch box to understand the dynamics of children's food environment. The food types in the lunch boxes were reported at the household level. The evidence points to the over consumptions of carbohydrates across the three categories. Carbohydrate was 40% or more across groups. Sugar related product was found to be highest only in the food types that children buy.

There was very low sugar consumption at the household level. At this juncture, it is unclear why there was low sugar consumption at the household level but other questions in the survey show that parents were concerned about children's eating habits. About 68% of parents stated that they were concerned about their child's eating habits. A further investigation of these concerns showed that over 40% of the parents were concerned about the child-eating candies and chips and sweeten products. There is evidence of nutritional deficiencies that exist in food types supplied under the SFP in South Africa (Nhlapo et al., 2015). The study found that 40% of food supplied under the

SFP did not meet the micronutrient standards for children 11-18 and for children 7-11years old, only 30% of the food met the iron standards. A recent evaluation of the school nutritional environment suggests that children are exposed to unhealthy foods in the school environment (Okeyo et al., 2020). This indicates that there is a need for effective monitoring and policy regulating children's ecological environment to ensure the best interest of the child.

8.4.5 Item Response (IR) Analysis of Food Choices

IRT was used to estimate the level of "*Ease"* at which certain products are consumed by children when allowed to make choices. The evidence suggests that children will most likely make wrong food choices if allowed to choose. Consumption of fruit and vegetables are rarely consumed by children if it depends on the child. Yet fruit and vegetables contain vital micronutrients that children need for their growth and healthy living. Other studies have shown that even teenagers are less likely to buy fruit, rather they will prefer sugar-sweetened food types (Bezerra et al., 2017).

The 1PL/ Rasch model was used to analyse the eighteen food types that were self-reported by parents and by the children. Other studies have applied a similar procedure and found that the model has an advantage over classical test theories (Hays et al., 2000; Owino et al., 2014). We estimated the coefficients to assess the level of difficulty and easiness of the parameters. The coefficient of difficulty was grouped in ascending order. Since a zero mean is assume for *beta,* an item that shows a negative coefficient indicates easiness while an item with a positive coefficient indicates difficulty. All the food types were significant at 95% *CI* for food types a parent or caregiver placed in their child's lunch box. Table 8.7 shows the food types that parent place in the child's lunch box in a typical school week. Parents were also asked if this was the usual food the child takes to school. We found that 38% of parents and caregivers reported the food indicated was the usual food, 22% said Often, 20% was Sometimes and 5% said Seldom. Just less than 15% reported Never.

The output in Table 8.7 below reports the items discrimination parameter (Discrim) This discrimination parameter is shared by all the variables in the model otherwise referred to as " items" The estimate of -1.13 seems to suggest that the items are discriminating. Given the circumstances of placing children from different backgrounds in similar conditions, they will make the same food choices or parents will make the same food choices for their children. The (Diff) row shows the difficulty estimates for each item. Item difficulty ranged from b_β=-9 b_β=5.65 (Partchev, 2004; (De Boeck and Wilson, 2004). Bread had the lowest item coefficient while Pizza had the highest item coefficient. These results show are the probability that a child living in townships in Cape Town will likely eat bread compared to Pizza.

Table 8.7 shows that only bread was found to have a negative coefficient. When the discrimination parameters are high it indicates poor discrimination ability thus insinuating that parents in the area who already have similar characteristics will make similar choices in their children's lunch boxes. The choices of cereals and starchy products indicate the ease and availability of these products in the children's environment. This evidence supports the call by Claasen et al. (2016) for policy development towards an improved food environment for adults and more especially for children living in poor urban communities in South Africa.

Table 8-7 IRT Analysis of Children's Lunch Box

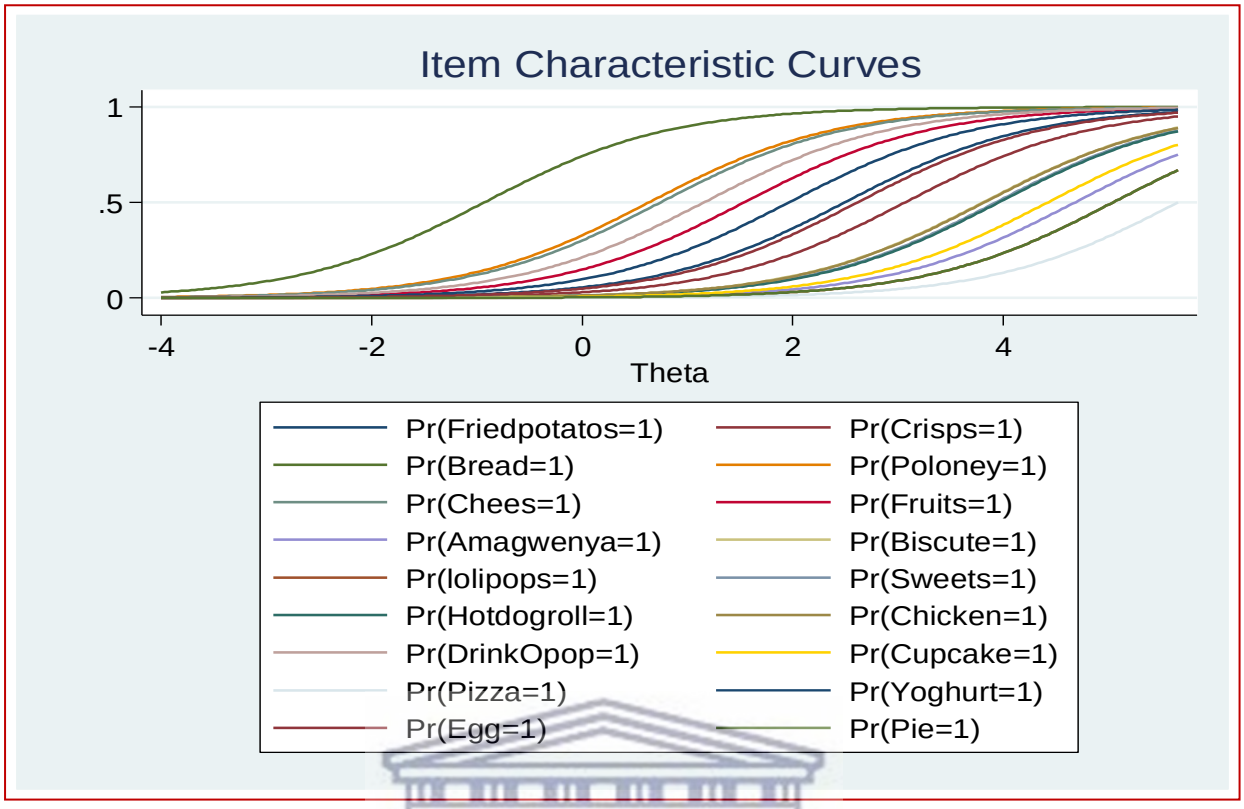
IRT Analysis of Children's Lunch Box				
	Coefficient	SE	z	P-Values
Discrimination	1.134641	.1006061	11.28	0.000
Diff				
Bread	-.9305485	.1242483	-7.49	0.000
Polonies	.6323088	.1175154	5.38	0.000
Cheese	.7425829	.1213489	6.12	0.000

Drink O pops	1.155124	.1409353	8.20	0.000
Fruits	1.53723	.1674094	9.18	0.000
Yoghurt	1.962378	.2069376	9.48	0.000
Fried potato	2.491931	.2588046	9.63	0.000
Egg	2.613419	.2737769	9.55	0.000
Crisps	3.065649	.3253134	9.42	0.000
Biscuit	3.804828	.4418953	8.61	0.000
Chicken	3.81754	.4409336	8.66	0.000
Sweets	3.925527	.4644486	8.45	0.000
Hot-dog-roll	3.955222	.4626685	8.55	0.000
Cupcake	4.420416	.5737969	7.70	0.000
Amagwenya	4.678178	.6408806	7.30	0.000
lollipops	5.039752	.7519867	6.70	0.000
Pie	5.039752	.7519867	6.70	0.000
Pizza	5.654877	1.000844	5.65	0.000

Source: Author's Analysis of empirical data

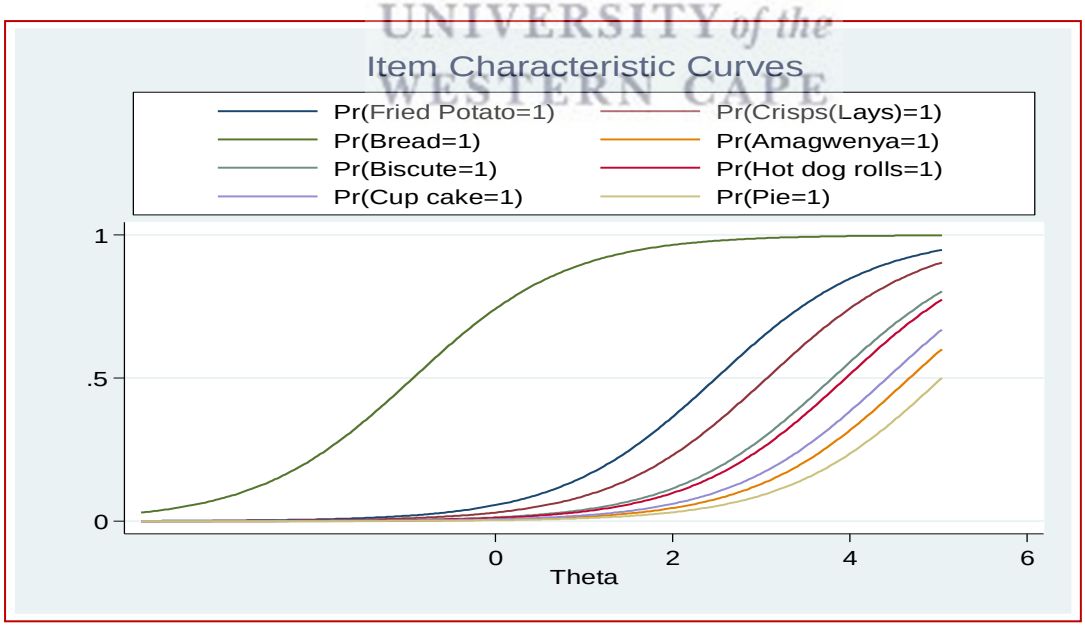
In Figure 8.2 below we show that what children take to school as reported by their parents or caregiver was largely cereal-based. Bread was the easiest food that would likely be found in a child lunch box based on probability. In Figure 8.3, we show the difference if only cereals or starchy food was analysed. It emerges that bread amongst starchy or cereal products is by far the most likely food types South African children living in poor urban peripheral townships are eating on a daily and weekly bases.

Figure 8-2 IRT of Children's Lunch Box



Source: Author's Analysis of empirical data

Figure 8-3 Starchy food in the lunch boxes of children.



Source: Author's Analysis of empirical data

8.4.6 Child health and socioeconomic factors

South Africa is generally defined within racial and cultural lines which has a great effect on Early Childhood Development. Children from poor households are highly disadvantaged in terms of their socioeconomic status. In the past two decades, the country has seen a massive exodus of its population from rural areas to urban metropolitan cities (Dinbabo et al., 2018). This transition from rural to urban areas is contributing to nutritional transition and distorted dietary patterns (Vorster 2010; Dinbabo et al., 2019).

Table 8.8 showed that BMI was progressive with age. This is acceptable because children grow and therefore their weight is expected to change. The overall mean for children within the age group was mean=17.30, sd=4.592. The result also indicates that though there was evidence of obesity in the age group, severer underweight was also recorded.

Table 8-8 Mean BMI for Children 5-11years

Mean BMI for Children 5-11years					
Age	**N=205**	**Mean**	**SD**	**Min**	**Max**
5	14	15.47858	2.46261	10.22963	20.58628
6	34	15.71062	5.01199	7.873175	38.83495
7	24	18.81113	5.425764	10.20833	39.36472
8	27	16.57596	3.31173	10.70313	28.62245
9	34	18.63583	10.71103	15.850071	25.14818
10	28	18.64812	4.798517	12.42975	33.3679
11	30	19.06774	4.485289	13.59388	30.78628
12	14	18.40284	3.493567	14.93117	26.26307

Source: Author's Analysis of empirical data

Furthermore, there was evidence of the association with children's BMIZ-Scores and socioeconomic indicators such as age, gender, household income, education, and household food expenditure. The average BMI Z-score for the children was 2.8 *sd=.2933*. The minimum BMI for Age Z-score was *min=1.76* and a *max= 4.30*.

Furthermore, actual Z-scores of the children's BMI using the WHO standards were developed. The result in Table 8.10 shows that 9% of the children were underweight, 61% were normal weight and 30% were overweight and obese. A comparison of the two areas that is Khayelitsha and Mitchells Plain shows a significant difference between the two areas. Khayelitsha was 7% higher than Mitchells Plain. There was no difference in %age for normal weight but Mitchells Plain has more underweight children than Khayelitsha.

Table 8-9 Actual BMI Z-Score Categories

	Actual BMI of children						
	Khayelitsha		**Mitchells Plain**		**Pooled**		
	n=101	**%**	**n=162**	**%**	**n=263**	**%**	**p-value**
Underweight	3	3%	21	13%	24	9%	0.009
Normal Weight	61	60%	100	62%	161	61%	
Overweight & Obese	37	37%	41	25%	78	30%	

Source: Author's Analysis of empirical data

Table 8.10 shows the Ordinary Least Square (OLS) regression analysis. It indicates an association between households with children, age, educational level, income from CSG, and household food expenditures from bivariate and analysis. Households with more than one child showed a significant association with BMI Z-scores. Compared to households with one child, BMI dropped significantly with an increase in children with a significant level of $p<0.05$. Similar results were found for age. BMI increased with an increase in age. This is obvious as children continue to grow they are likely to put on weight. From an educational perspective, it was found that children in Grade 2, 5, and 6 were significantly associated with Z-scores. However, children in Grade 2 and 5 showed a positive increase in BMI compared to grade 6 where BMI dropped. The CSG and Household food expenditure are the household income-related variable. Household food expenditures and households with children that receive CSG showed a significant association with

BMI. This evidence suggests that an increase in household food expenditure and the CSG is likely to give increase access to food. However, when income increases the likelihood of a sedentary lifestyle of poor nutritional habits could lead to an increased weight gain in children living in urban peripheries. Nutritional and energy balance is not just about having money to buy food but to buy the right food and to eat healthily. The result also indicates that CSG could be contributing to childhood overweight and obesity in the study area. There was no significant association between BMI and household income, gender, and race. In Chapter six already provided an elaborate explanation of the factors influencing food choices of South Africa's living in urban peripheral townships.

Table 8-10 Association of child BMI Z-Score and socioeconomic factors

Bivariate analysis of the association of child BMI Z-Score					
Demographics		N	%/mean	Coef.	p-value
No. of children in HH	1 Child	306	52.31	-.62	
	2 Children	238	40.68	-.44	**0.006**
	3-4 Children	41	6.64	-2.04	**0.016**
Age	(5-11)	573	7.92	.58	**0.016**
Gender	Male	260	45.38	. .46	.486
	female	313	54.62		
Race	Black	316	55.63	-0.02	0.485
	Coloured	252	44.37		
Education	Grad R	92	27%	-	-
	Grad 1	106	31%	-0.02	0.198
	Grade 2	49	14%	0.14	**0.006**
	Grade 3	32	9%	-0.05	0.24
	Grade 4	27	8%	-0.02	0.31
	Grade 5	12	3%	0.04	**0.03**

	Grade 6	10	3%	-0.01	**0.062**
	Grade 7	11	3%	-0.09	0.096
	Grade 8+	5	1%	0.03	0.907
Household Income	No income	39	5%		
	R1-1200	80	11%	-.04	0.73
	R1201 - 2400	152	21%	-.02	0.82
	R2401-3600	134	19%	-.04	0.69
	R3601-4800	103	14%	.069	0.54
	R4800+	212	29%	.05	0.60
CSG	Yes	385	43%	0.12	**0.00**
	No	517	57%		
HH Food expenditure	Expenditure	801	R1509.8	.000	**0.002**

Source: Author's Analysis of empirical data

8.5 Analysis of BMI Z-scores and child health perception

The implication of food choices on children's health status was measured using first the children's self-perceived health and actual WHO BMI-for Age Z-scores for the children as shown in Table 8.9 above and 8.11 below. From the findings, 90% of children evaluated their health from good to excellent. Using the Ordinary Least Square regression model, children who reported very good health also had a significant association with increase in BMI Z-Score with $p<0.05$. Children were also given a weight chart to estimate visually what they perceive their weight to be. Findings indicate that 56% of the children visualize themselves as overweight and obese. This evidence corroborates with the actual BMI z-scores as stated above.

Table 8-11 Association of child BMI Z-Score and health perception

				Coef.	P-Value
Health perception	Excellent				
	Very Good	38	16%	5.007	**0.05**
	Good	73	31%	3.436	**0.10**
	Fair	15	6%	3.308	0.38
	Poor	5	2%	10.971	**0.03**
Perceived weight	Very underweight				
	Slightly underweight	35	25%	2.307	0.508
	About the right weight	54	38%	2.938	0.389
	Slightly overweight	14	10%	6.889	0.092
	Very overweight	11	8%	7.022	0.177
	Not very sure	11	8%	9.066	**0.044**

Source: Author's Analysis of empirical data

The factors that influence people's food choices are multidimensional. They include socio-demographic, economic, cultural, and religious factors. Therefore, children are not any exception. In South Africa in particular, geographical location within an urban space could greatly impact food choices. This study was carried out in two urban peripheral townships in Cape Town. Access to food as well as nutrition is affected by a combination of associated factors (Lichtenstein et al, 1998). The children and women are the most vulnerable in society and terms of food choices; several studies have shown the vulnerability of women and children. This study has shown that poor dietary diversity, overconsumption of food high in carbohydrate as well as sugar-sweetened food items have been slowly impacting the lives of children.

8.6 Conclusion

The main objective of this chapter was to interrogate the food types that children buy without parental control and its possible implication on children's health status, as well as to close the gap in the literature which largely focuses on the food choices of adults, and where children's food

choices have been studied they are focused on home and school feeding programmers as a well parental influence in their children's food choices.

The chapter identifies the food types that children buy, what they eat at home, and what is usually given in the lunch boxes for children attending school. In the view of this researcher, there are two possible outcomes of the phenomenon of children eating out of parental control. In the first instance, given money to children for food purposes could be a strategy of parents to overcome child hunger. On the other hand, children can become more vulnerable to eating unhealthy food out of the home environment. In this analysis, the type of food children eat at home was measured using a 24h recall. Though there are certain limitations to the use of this methodology, 24h recall is advantageous in giving a synoptic view of what households and individuals eat or are likely to eat on a balance of probability. It was found that 39% of children in the sample had DDS of <4 which is below the national average. Low dietary diversity is an indicator of hunger and malnutrition at the household level. The results have shown that carbohydrate is the dominant food group consumed at the household level and when the children buy food. Concerning food bought by children, carbohydrates represent 40% and sugar 35% of food types children ate outside of parental control.

Given that children were deprived under the apartheid system to have access to basic food and nutrition needs, the current sociopolitical terrain of South Africa has made it possible for children to have the right to access healthcare, healthy eating under the constitution, and the Children's Act. However, these rights have remained limited in addressing some of the gaps in its implementation. Children from poor communities and poor households are the most vulnerable to unhealthy food choices. The onus of who decides what is best for the child rest on the parent or caregiver of the child. In a community where poverty and inequality remain endemic, it is difficult to ascertain whether in the present circumstances of unemployment and dependence on CSG, parents, and caregivers can guarantee the BIC in terms of healthy food choices. Where parental

control is limited as regarding children buying food for themselves, it becomes practically impossible to institute the BIC. How the right to nutrition translate to healthy eating for children in poor communities is not clear. Government policy on School Feeding Programme (SFP) is limited to the school environment and therefore what happens outside the school environment concerning what the child eats is out of control. In addition, children who are not attending any formal education are left out of the policy of SFP. There is no mechanism that focuses on non-school going children.

This chapter shows that children lack access to nutritious food and where such food types are available income has been a barrier. The findings showed that children in poor urban communities in Cape Town are feeding carbohydrate related starchy staples. These children eat starchy staples at home, carry c starchy staples food type to school and buy it when allowed to make personal choices. With the increase in obesity amongst South African children, child obesity is likely to become endemic. The study recommends that improve policy on what is sold at schools shops be implemented. Furthermore, increasing the child support grant could go a long way to improving children's and household access to balance dietary patterns in poor and marginalized communities in South Africa. The next chapter assessed the best interest principle to ascertain how poor households in peri-urban townships are applying the BIC in their circumstances.

Chapter 9

ANALYSIS OF THE BEST INTEREST OF THE CHILD

9.1 Introduction

The Best Interest of the Child (BIC) policy is an international approach to ensure the social protection of the child through International Human Rights mechanisms. This chapter aims to interrogate the BIC in South Africa in the context of child obesity by assessing the rights of the child to food and nutrition or in general terms the child's right to health (Büchner-Eveleigh and Nienaber, 2012; Tobin, 2019). It examines the BIC policy in South Africa and shows to what extent its response to child health. The chapter seeks to assess how the policy of the BIC response to child obesity in South Africa, the extent of its contribution to reducing child obesity. In addition, it examines strategies used by parents from disadvantaged backgrounds in response to BIC.

The chapter looks at access to food, availability of food, children's responses to hunger as wells as their response to skipping meals, parental concerns to children's health, and eating habits. To achieve this aim, a set of calibrated questions were design to understand children's perspective of the right to food, how concerns are parents and caregivers from underprivileged backgrounds addressing the BIC despite their limited sources. The chapter responds to one of the key research objectives- to understand the extent to which poor households are likely to respond to the BIC as prescribe by the Unilateral Declaration of Human Rights, the Convention of the Rights of the Child, and the South African Children Act 25 of 2005.

A set of general questions were developed as an attempt to quantitatively measure the BIC in terms of food access, food choices, and food availability at the household level. The objective was to address one of the key research objectives on how the BIC policy addresses the problem of child obesity in South Africa.

9.1.1 Background to the Best Interest of the Child (BIC)

Children's right first made inroads in international law in post-World War I. At the 1924 Geneva Declaration on the Rights of the Child, adopted by the League of Nations in 1924 and later extended to the United Nations, the first steps towards an international legal framework for the protection and promotion of the rights of the child were laid. (Detrick et al., 1992). The first five were adopted in 1948 and 1959, the United Nations General Assembly adopted the 1924 Geneva Declaration on the rights of the child as an international legal instrument for the protection of the rights of children worldwide (Detrick et al., 1992; Hammarberg, 1990). The Declaration was later developed in the Convention of the Rights of the Child in 1989 and ratified by the United Nations General Assembly under Resolution 44/25 of 20 November 1989 (Kaime, 2009; Kilkelly and Liefaard, 2019).

The first principles of the rights of the child were articulated in the Geneva Declaration:

1. "The child must be given the means requisite for its normal development, both materially and spiritually.
2. The child that is hungry must be fed, the child that is sick must be nursed, the child that is backward must be helped, the delinquent child must be reclaimed, and the orphan and the waif must be sheltered and succoured.
3. The child must be the first to receive relief in times of distress.
4. The child must be put in a position to earn a livelihood and must be protected against every form of exploitation.
5. The child must be brought up in the consciousness that its talents must be devoted to the service of its fellow men" (Geneva Declaration 1924, p.1)

These five points formed the cornerstone of children's rights and BIC. In the first principle on the rights of the child, *"…the child **must** be given the means requisite for its normal development…*" and the second principle "*The child that is hungry **must** be fed…*"

These principles form the very objective of this chapter, to access the principle of the BIC in the context of children's right to food and health care. However, one of the major drawbacks of the 1924 Geneva Declaration was that it was never intended nor contemplated to be binding on State

parties to the agreement. Thus, the articulation of the word ***must*** in the Declaration was never given credence.

The rights of the child as propounded by the Universal Declaration of Human Rights 1948[10], The Hague Convention on Protection of Children and Cooperation in Respect of Intercountry Adoption, 1993, the United Nations Convention on the Rights of the Child, 1989; the African Charter on the Rights and Welfare of the Child, 1990; are the most cherished international and regional instruments for protection and promotion of the welfare the child. The preamble of the Universal Declaration of Human Rights 1948 states: "Whereas recognition of the inherent dignity and the equal and inalienable rights of all members of the human family is the foundation of freedom, justice, and peace in the world" (UN, 1948, p.1).

This was the beginning of a more detailed human right instrument with compelling clauses to correct the mistakes of the Geneva Declaration on the rights of the child. The United Nations General Assembly adopted the 1959 Declaration of the Rights of the Child (Sisilana, 2016). The 1959 Declaration advanced the Geneva Declaration. Its preamble situates children's rights within the broader framework of the Universal Declaration of Human Rights. The recognition of the dignity, equality, and fairness of all members of the human family as a fundamental right, freedom, and justice compels the respect of these rights and freedoms as provided for by Articles 56 of the UN Charter 1945. It is within this framework that UN members States reaffirm their commitment to progressively uphold and develop the fundamental human rights proclaimed under the 1948 Human Rights Declarations (Doek, 2019; Liefaard, 2019; Sisilana, 2016; Verhellen, 2000).

[10]UN General Assembly, 1948. Universal declaration of human rights. UN General Assembly 302.

The Preamble of the 1959 Declaration of the Rights of the Child "calls upon parents, upon men and women as individuals, and upon voluntary organizations, local authorities, and national Governments to recognize" the rights of the child and to ensure its progressive implementation (UN General Assembly, 1959. This provision places the primary burden of care on parents[11] and the State only plays a supervisory or intervention role in the promotion and protection of the rights of the child. The main question this chapter seeks to address is whether, given the state of poverty in peri-urban areas, parents have the means and capacity to promote and protect the rights of the child by making decisions that are in the BIC.

The key elements of the 1959 Declaration that are relevant to this study are:

1.1.1.1.1.1.1 Every child regardless of their sex, race colour and cultural backgrounds is entitled to the rights of the child **(Articles 1)**

1.1.1.1.1.1.2 Every child shall be given protected and enabled to develop physically **(Articles 2)**

1.1.1.1.1.1.3 The best interests of the child shall be paramount in any legislation regarding the **child (Articles 2).**

1.1.1.1.1.1.4 The child shall have the right to adequate **nutrition**, housing, recreation, and medical services **(Articles 2).**

1.1.1.1.1.1.5 he **best interests of the child** shall be the guiding principle of those responsible for his education and guidance; that responsibility lies in the first place with his parents **(Articles 7).**

The 1959 Declaration of the Rights of the Child was further limited in that it was non-bind on member states but its contribution to shaping the rights of the child globally cannot be overstated. The Declaration lays down the first comprehensive structure for the establishment of a binding

[11] The 1959 Declaration of the Rights of the Child

instrument that will act as international legal instruments for the best interest of the child. This was the outcome of the Convention on the Rights of the Child, adopted by the United Nations General Assembly on November 20th, 1989.

The Convention on the Rights of the Child applies to 'every human being below the age of eighteen years'(Articles 1 of CRC) and defines the procedural and substantive rights and recognized these rights in the context of civil, political, economic, social and cultural rights of the child. These socioeconomic and political rights are related to the right to health and health care, the right to social assistance, and education (Assim, 2009; Büchner-Eveleigh and Nienaber, 2012; Kilkelly and Liefaard, 2019; Sloth-Nielsen, 2016). Though the convention addresses almost every aspect of the child's life, Article 3 sets out to promote the best interest of the child in all matters relating to the child (Kaime, 2009).

Furthermore, the rights of the Child also form part of the core pillars of the African Charter on the Rights and Welfare of the Child ('herein noted as the African Children's Charter' or 'the Charter'). First, the African Children Charter was found as one of the principles of the international law on the rights and welfare of the child as contained in the founding Conventions, Declarations, and Protocols of the United Nations and the African Union. Secondly, the African Charter on the Rights of the Child acknowledges the cultural diversities of the African States, its heritage, and civilisations that if not taken into considerations could have adverse effects on the implementation of the rights of the African child (Burman, 2003; Sisilana, 2016).

South Africa's constitution allows for the country to ratify international Convents and Treaties that it deems relevant for the countries socio-economic and cultural development. South Africa ratified the CRC on after two years of becoming a signatory to the Convention in 1993 (Sisilana, 2016). This makes it binding for the government of South Africa to create laws that promote the objects CRC.

9.1.2 The Best Interest Principle

"In all actions concerning children, whether undertaken by public or private social welfare institutions, courts of law, administrative authorities or legislative bodies the best interests of the child shall be a primary consideration" (Article 3(1) of the CRC) (UN, 1989, p.1)

The BIC has been applied most especially in custody cases where the interest of the child was previously neglected. Several studies have highlighted that the BIC within the CRC does not create an enforceable right rather it is based on the interpretation that needs to be considered in all child-related issues(Büchner-Eveleigh and Nienaber, 2012; Cleophas, 2013; Sisilana, 2016, 2016; Sloth-Nielsen, 2019, 2016; Verhellen, 2000).

Despite its international recognition and acceptance, BIC is one of the key principles in children's rights with many controversies as to its definition and interpretation. The challenge of determining has had substantial attention especially in custody matters(Degol and Dinku, 2011; Hammarberg, 1990). Also, due to the international multiculturalism and economic and social dynamics of different countries and peoples, the BIC is determined by each State with the Convention providing the guidelines (Mahlobogwane, 2010).

Since the establishment of the BIC principle as a human right approach to child protection, the voice of the child is silent when decisions are made that affect the child (Semple, 2009). In South Africa, the courts have established 13 criteria to determine the BIC with one of those criteria relating to the health and fitness of the child (Bregmans, 2014). However, there is no legislation or rule of law that seeks to protect children from overweight and obesity in South Africa (Buchner-Eveleigh, 2016; Büchner-Eveleigh and Nienaber, 2012). Rather, few pockets of legislation that are related to child protection in one form or the other. There is the National Health Act 61 of 2003, the Mental Health Care Act 17 of 2002, and the Children's Act 38 of 2005 (Buchner-Eveleigh, 2016). These three Acts are fundamental legislative frameworks for child health protection in South Africa which are also limited and have focused more on access to health services and

treatment. Legislation that provides for preventative and deterrence measures is either too limited or completely absent. Where such legislation exists, they are not sufficiently detailed to protect children from food-related harm to promote children's health and wellbeing.

The Best Interest of the Child (BIC) is broad and sometimes determining what is in the best interest of the child is not clear. Given the roles of parents and caregivers, the State, NGOs, and Civil Society at large, defining the best interest becomes challenging. Albeit what may be considered to be in the best interest of the child for one parent or caregiver, may not necessarily be construed as in the best interest of the child by the state or civil society organisation. However, the South African Children's Act and the Constitution of South Africa has laid down the basic principles for determining the right of the child and not necessarily the BIC.

9.2 Children's right in South Africa

Children's right in South Africa is protected under Section 28 of the Bill of Rights in our Constitution, the Mental health Act and states that "every child has the right to basic nutrition, shelter, health care, and social services, as well as the right to be protected from maltreatment, neglect, abuse or degradation (Constitution of the Republic of South Africa 1996). When South Africa adopted the Convention on the Rights of the Child (CRC) it was fulfilling its constitutional mandate to ensure the protection, promotion of the rights of the child. The CRC sought to address certain key lacunae in the protection and promotion of the rights of the child. Before its enactment in 1989 and final enforcement in 1990, the protection of homeless children or children without a family environment and children affected by natural disaster and war, was non-binding under the Geneva Declaration on the Rights of the Child of 1924. the Declaration on the Rights of the Child 1959, the 1986 Declaration on Social and Legal Principles relating to the Protection and Welfare of Children with particular attention to the Foster Placement and Adoption Nationally and Internationally paved the way for the enforcement of the Rights of the Child in international treaties (Assim, 2019). According to (Hammarberg, 1990) one of the objectives for a Convention

instead of a Declaration, was to come up with an agreement that was binding upon states parties.

Given that earlier international instruments did not ensure mandatory protection of all children and in all circumstances in the nonbinding agreements, state parties were not obliged to enforce the multilateral treaties. This led to the CRC that especially targeted vulnerable children.

The provision of Articles 20 is a general guideline for the protection of the Child Children Without Parental Care (CWPC), Children Deprived of a Family Environment (CDFE). However, the protection contemplated in the Article relates more protection from abuse,

> (1) A child temporarily or permanently deprived of his or her family environment, or in whose own best interests cannot be allowed to remain in that environment, shall be entitled to special protection and assistance provided by the State. (2) States Parties shall in accordance with their national laws ensure alternative care for such a child. (3) Such care could include, inter alia, foster placement […] adoption or if necessary placement in suitable institutions for the care of children. When considering solutions, due regard shall be paid to the desirability of continuity in a child's upbringing and to the child's ethnic, religious, cultural and linguistic background (UN, 1989, p.1).

The above provision is yet limited to addressing other issues relating to the protection of the child. This chapter advocates for the protection of the child even from diseases such as obesity which in most cases household related.

The Convention on the Rights of the Child (CRC) provides in its Article 20 a Universal Framework for the Protection of Children Deprived of Family Environment but establishes no rules or practical guidelines on the implementation of provisions contained therein (Assim, 2009; Sloth-Nielsen, 2019). The Convention assumed that children already living within a family

environment are protected. However, this is not the case especially in the context of South Africa where 64% of children are living in the poorest household yet the focus of the Convention seems to insinuate that children in households are already protected. In South Africa, there is a need to identify all children potentially at risk in one form or the other to develop an appropriate response mechanism. The Children's Rights is established as the seventh focus areas identified by the South African Human Rights Commission requiring a dedicated focus to effectively fulfil its mandate of promoting, protecting, and monitoring the realisation of the rights of child in South Africa.

9.2.1 Children's Right to Health

The 1996 Constitution of South Africa provides for the right to health in the form of access to health care services and made it mandatory for the State to put in mechanisms to ensure a progressive realisation of access to health care services. Section 27(1) expressed the right to health care services and Section 27(2) oblige the government to execute and facilitate the implementation of health care for all. of the Constitution. Besides the general provisions of the right to health, Section 28(1)(c) of the Bill of Rights specifically relates to children's health. According to Section 7(2) of the Constitution, which strengthens Section 27(2), the State is constitutionally charged with the responsibility to protect the health of the child, promote the child's right to health. Given the rising trends in child obesity in South Africa, children from poor households remain the most vulnerable to malnutrition, stunting, overweight, and obesity.

9.2.2 Children's right to food

The United Nations Convention on the Rights of the Child (UNCRC), African Charter on the Rights and Welfare of the Child (ACRWC) and the South African Children's Act 38 of 2005 are a few of the international and national legal instruments designed to protect and foster the right of the child internationally and locally. In the South African constitution of 1996, Section 27(1) (b) provides sets out the framework for the basic human right of the child in South Africa. "Everyone

has the right to have access to sufficient food and water..." (South Africa Constitution of 1996). In section 28(1) (c), the Constitution further expanded on the right of the child to nutrition. This means that given the obligation of Section 27(2) on the state, and parent and caregivers, as well as the immediate family of the child duly, constituted as the caregiver of the child, provision of food goes beyond food, to food and nutrition. This means that the food provided has to be nutritious. However, though many a research in this area has viewed children right from a protectionist perspective- sexual and physical abuse for example (Seddighi, et al., 2019; Petroni, et al., 2019; Plagers on, et al., 2019), this paper argues that children need to the protected from undernutrition and over nutrition.

Children under international law are mandated as right bearers (Hall et al., 2018). The United Nations Convention on the Rights of the Child (UNCRC) has acquitted children from the ancient view of assets or property by creating a child protection mechanism. The International Convention on the Economic, Social and Cultural Rights recognised the rights of the child as a basic human right. Article 10 states that "Everyone has the right to an adequate standard of living for himself and his family, including adequate food, clothing and housing. Everyone has the right to be free from hunger" ICESCR, 1966). Under the socio-economic right approach, children's right is guaranteed in so many ways. The ICESR protect children's right to survive, the right to health and health care, and ultimate the right to a "standard of living adequate for the child's physical, mental, spiritual, moral and social development". Given the many international and local legislation relating to the protection of the child, "The case that children have rights has to a large extent been won: the burden now shifts to monitoring how well governments honour the pledges in their national laws and carry out their international obligations" (Macaulay, 2014).

The best interest of the child policy framework was adopted to address child protection both internationally and locally. The injustices currently in South Africa is traced to its apartheid past (Jamieson et al., 2017). Apartheid plunged many South Africans into destitution and created

intergenerational poverty. In the Apartheid era, social welfare policies were segregated around race and class which left the majority of the black African population languishing in poverty and inequality (Dinbabo, 2011; September, and Dinbabo, 2008). The lack of access to land, deprived the black population of participating in the economy, therefore, creating spatial imbalances in food production and distribution (Dinbabo, Belebema, & Mensah, 2018).

The right to food and nutrition is based on the "six pillars of adequacy, availability, quality, safety, acceptability, and accessibility" (Chirwa, 2009, p.8). One of the main drivers of the lack of access to nutrition-rich food types is the price (Harris, et al., 2019). Studies have shown that South Africa is not suffering from the lack of food availability but the lack of access but the absence of equitable distribution and income poverty (Saha, et al., 2019). Though Chirwa, (2009) broadens the context of food, as involving the need for food in spiritualty rather than the context of consumption for wellbeing, this research holds a different viewpoint. The construction and designing of the law must have had one agenda, to reduce hunger and malnutrition through adequate access and distribution of food and nutrition.

9.2.3 The Best Interest of the child framework in South Africa

The injustices currently in South Africa is traced to its apartheid past (Jamieson et al., 2017). Apartheid plunged many South Africans into destitution and created intergenerational poverty. Recent statistics show that "10% of people living in South Africa who are predominately Whites, are owners of 90 – 95% of national wealth, leaving the poorest half of the population with no measurable wealth, while the poorest 50% are almost all Black. These extreme inequality is the primary reason for persistently high rates of crime, violence, and social unrest (Jamieson et al., 2017).

The post-apartheid government continues to strive towards social justice and equality for all. Article 24 of the UN Convention on the Rights of a Child make provision for children to be given

the best healthcare and access the best health care service. It added that children have the right to nutritious food and to remain healthy (ACRWC).[12] The South Africa Children Act 38 of 2005 provides for the best interest of the child in its section 9. “In all actions concerning the care, protection, and well-being of a child the standard that the best interest of the child is of paramount importance, must be applied” (Children’s Act 38 of 2005). These rights are also entrenched in the South African Constitution (1994)[13]. As stated above, the institution of government's social support scheme was based on the implementation of the United Nations Convention on the Rights of the Child which was eventually heavily backed by the South African Children’s Act 38 of 2005.

9.3 A quantitative approach to the Best Interest of the Child

The right to food is a fundamental human right but to what extent is the right to food and nutrition measured in South Africa. Several studies have measured the food security and not the right to food (Barrett, 2010; Bickel et al., 2000; De Cock et al., 2013; Pinstrup-Andersen, 2009, 2009; Rose and Charlton, 2002b). In this analysis, measuring the right to food under the framework of the BIC, a set of calibrated questions were developed based on the literature on human rights. Likert scale questions were designed with the following measures on a scale of 3, where 1=Always, 2=Sometimes, and 3=Never. A BIC index was developed using the calibrated instrument for the BIC.

In Babbie (2007) developing a data reduction instrument is a viable way of studying a phenomenon with multiple composite indicators. This helps to develop a single numerical score to measure the extent to which, it becomes paramount for the researcher to develop a data reduction instrument so that a composite indicator is developed with a single numerical score to measure the extent of

[12] Article 14(1) of the African Charter on the Rights and Welfare of the Child states that “every child shall have the right to enjoy the best attainable state of physical, mental and spiritual health”.

[13] Constitution of South Africa 1994, Section 27 “…provides that everyone has the right to have access to health care services.” Section 28(1)(c) gives children “the right to basic nutrition and basic health care services”.

the problem. Several studies have applied the same principle such as the Health Perception Index (Majee et al., 2019), Consumer Price Index (Bryan and Cecchetti, 1993), Human Development Index (Noorbakhsh, 1998) and the Economic Security Index (Hacker et al., 2013).

The data empirically evaluate the rights of the child in terms of food availability, food access, and food satisfaction. In line with the BIC principle, the *Best Interest Index (BII)* was developed using the calibrated question which was analysed in STATA. Given that the measure of whether the child's best interest was considered at the household level, the *BII* was correlated with the parental interest of the child. Parental interest was measured by asking if the parent or caregiver was concerned for the child in terms of what the child eats and in terms of the general health status of the child.

Children were asked to answer the 13 questions to identify the level of access to food at the household level and to draw conclusions as to whether poor households can afford the BIC given their socioeconomic circumstances. The CRC 1989 and the South Africa Children's Act 38 of 2005 place the burden of care on the parents and members of the household where the child abodes.

Vagias (2006) developed a list of possible Likert scale type questions which has been used widely to evaluate various social phenomenon. Jacoby and Matell (1971) state that what is relevant in any scale is whether there is the possibility of collecting sufficient response from the population. Likert Scale questions have been used widely in social sciences to test behavioural and attitudinal characteristics of a population (Croasmun and Ostrom, 2011; Dutton and Blum, 1968; Jacoby and Matell, 1971; Vagias, 2006). It was an appropriate methodology in the case of this study to develop such Likert scale variables or multiple response variables into a single numerical score. In computing the *BII* index, values were assigned from 1 to 3 where 1 represents a low score and 3 represents the high score. When a score of 3 was selected by a child, it was assumed to be of the child's best interest. Besides, identifying the *BIC* by caregiver or parent also followed a similar procedure except where the BIC necessitates that a child selects a lower figure or parents selects a

lower figure. In such circumstances, depending on the question asked, the researcher recode the scales to measure the overall *BIC*. This three-point Likert scale procedure was used to allow children to easily evaluate their access to food their perception of how their parents or caregiver ensured their rights to food, health and protection.

9.3.1 Analysis of the Best Interest of the Child: A Likert Scale Approach

Likert Scale analysis of data was first introduced by Likert in 1932 (Göb et al., 2007). The scaling technique has been applied in several studies measuring for attitude. In the Likert scale questions, individuals are provided with statements requiring inner judgments and decision making. Such judgments may reflect the individual's cognitive reason, psychological disposition feeling, and desires. Some of the most common Likert scale designs are five-points, seven-points, and three-point Likert scales(Majee et al., 2019). In this analysis, a three-point Likert scale questionnaire was used to analyse children's perception of their right to food. A set of calibrated questions developed from the literature was designed to access children's views on their children's right to food.

The Weight Value for each of the indicators is a sum of total responses for each of the scale values/weights, express it mathematically:

$$BICI=\sum_{i=1}^{5} b_i V_i$$

BICI = is the sum of the total weight value;

Pi = is the number of respondents to rating i;

Vi = is the weight assigned to a response.

To determine the index (I), for each variable we divide the TWV by the summing the responses as expressed below:

$$\frac{BICI}{\sum_{i=}^{5} P_i} = \frac{\sum_{i=1}^{5} P_i V_i}{\sum_{i=1}^{5} P_i}$$

$$I = \text{BICI}/\Sigma Pi5i=1= \Sigma PiVi5i=1\Sigma Pi5i=1 \quad [2]$$

The mean index, denoted as *I* is derived by summing up the index for each variable and dividing it by the number of the identical variables. It is computed mathematically thus:

$$\bar{I} = \frac{\sum I}{n}$$ where n = total number of identical variables See Table below.

A similar approach has been applied in the Human Development Index (Noorbakhsh, 1998) and the Economic Security Index (Hacker et al., 2013).

9.4 Results

The purpose of developing the *BICI* was to assess children's response to what is considered the BIC. This analysis addresses one of the core research questions in the study. The right to food is a basic human right as is emphasised in this chapter. However, the right to food means nothing for children if the child is not free within the household environment to ask for food when he or she needs it. The right to food seeks to ensure that children have access to food at all times and in the right quantity and quality. This perspective of quality and quantity is what is usually left out when analysing children's access to food. Below is a description of the responses from the 13 questions developed to ascertain the BIC. Table 9.1 shows the distribution of responses concerning the BIC. These questions capture the children's perception of children's access to food and how parents attempt to ensure children's best interest. The result shows the responses to the best interest test from the children's perspective. Section 9.4.1 to 9.4.5 discussed in Table 9.1 below.

Table 9-1 Analysis of the Best Interest of the Child

Descriptive analysis of Best Interest of the Child (BICI						
	Khayelitsha			Mitchells Plain		
	Always	**Sometimes**	**Never**	**Always**	**Sometimes**	**Never**
Child ask for food when hungry	118 (82.52%)	19(13.29%)	6 (4.20%)	143 (71.14%)	36(17.91%)	22(10.95%)
Child ask for food when there is food	87(60.84%)	40(27.97%)	16(11.19%)	108(53.73%)	51(25.37%)	42(20.90)
Child eats late because food is prepared late	27(19.01%)	71(50.00%)	44(30.99%)	29(14.57%)	91(45.73%)	79(39.70%)
Child's food is kept when child does not eat	120(85.11%)	10(7.09%)	11(7.80%)	114(56.44%)	55(27.23%)	33(16.34%)
Child skip meals at home	70(48.95%)	73(51.05%)	00(00%)	109(54.23%)	91(45.27%)	1(0.50%)
Child refuse to eat from neighbours	71(51.45%)	67(48.55%)	00(00%)	114(57.29%)	83(41.71%)	2(1.01%)
Parents prevent child from eating from neighbours	73(51.41%)	39(27.46%)	30(21.13%)	89(44.28)	51(25.37)	61(30.35%)
Parent stop child from eating fatty food	44(31.21%)	34(24.11%)	63(44.68%)	44 (31.21%)	34(24.11%)	63(44.68%)
Child likes the food served	87(65.91%)	42(31.82%)	3(2.27%)	155(74.16%)	47(22.49)	7(3.35%)
Parents ask the child to make their choice food	60(45.45%)	45(34.09%)	27(20.45%)	69(33.17%)	86(41.35%)	53(25.48%)
Child feels hungry shortly after eating	24(18.05%)	53(39.85%)	56(42.11%)	27(13.17%)	64(31.22%)	114(55.61%)
Child's plate of food is small	23(17.42%)	33(25.00%)	76(57.58%)	30(14.85 %)	37(18.32%)	135(66.83%)
Food is served when the child is no longer hungry	9(6.82%)	38(28.79%)	85(64.39%)	11(5.98%)	69(37.50%)	104(56.52%)

Author's Analysis of empirical data

The child asks for food when hungry

This question tests the freedom of children to ask for food when they are feeling hungry. In Khayelitsha, 82% of children were free to ask for food always 71% in Mitchells Plain. The Child asks for food when hungry: the mean was slightly higher than the population mean. The results show that children were free to ask for food when they were hungry and when food was available.

This is indicative of children's freedom at the household level. Comparing the two areas, however, showed a significant difference in the two populations. The results generally show that parents from poor urban townships are likely to ensure the vulnerable to being denied the right to food. In chapter 8 72% of children are in households that receive at least one form of social assistance from the government.

The child eats late because food is prepared late: About 50% of the children in Khayelitsha reported they sometimes eat late compared to 45% in children in Mitchells Plain. Just about 19% in Khayelitsha stated that they eat late always compared to 14% in Mitchells Plain. Eating late for many poor households may indicate food insecurity in the household. It is not in the child's best interest to eat late at home. Studies have shown that eating late is a link to childhood obesity and other related diseases (Eng et al., 2009; Kohn and Golden, 2001). (Mchiza and Maunder, 2013) found evidence suggesting that set time for children to eat was protective of obesity.

9.4.1 Child skip meals at home

This question was asked to determine different aspects related to the child's rights. Skipping meals is associated with food insecurity and poor eating habit. Table 9.1 48% and 51% of children in Khayelitsha Always and Sometimes respectively skip meals. In Mitchells Plain, it shows that 54% and 45% always and sometimes, respectively skip meals. This indicates that more children are likely to skip meals in the study area compared to children who never skip meals. Skipping meals is a prevailing childhood habit. The reasons for children skipping meals vary. Some studies have found that skipping meals is a strategy in poor households to secure food for the next day (Harvey, 2016; Yahia et al., 2008).

9.4.2 Child refuses to eat from neighbours and parents prevent the child from eating from neighbours

These two indicators were developed to test children's ability to self-protect and parental control. Eating outside of parental control be both beneficial for the child and risky. Children suffering

from food insecurity in poor communities are likely to seek food shelter from neighbours. This study did not ask the children why they refuse to eat from neighbours nor why parents refuse a child from eating outside. However, in the present context, such an approach is indicative of protecting the child's best interest. It is intriguing to note that for both areas, children and parents are highly protective. About 51% of children in Khayelitsha who always refuse to eat from neighbours also have parents who prevent them from eating away from the home environment. In Mitchells Plain, the results were slightly different. Child protection is well articulated in the Constitution of the Republic of South Africa (South Africa, 1994). Section 28(1)(d) states that "every child has the right to be protected from maltreatment, neglect, abuse and/or degradation". Hendriks (2014) explores the critical role of mandatory reporting in the Children's Act especially in the case of child abuse and neglect which is now protected under section 110 of the Children's Amendment Act 45 of 2007[14]. In the view of this researcher, the failure of a parent to protect the child is tantamount to a breach the the child's constitutional right.

9.4.3 Parent stop child from eating fatty food

The objective of this question was to assess from the child point of view on how their parent responds to their food choices. Parents who are aware of the risk factors of child obesity are likely to protect their children thus complying with the principle of the BIC. Protecting a child from food high in fat and carbohydrate is an indicator of parental awareness on the risk of overweight and obesity. In chapter 8 above, it was found that 68% of parents stated that they were concerned about their child's eating habits. A furthermore, over 40% of the parents were concerned about the child-eating candies and chips sweeten products. The South Africa Children Act 38 of 2005 provides

[14]"Section 110 of the Children's Amendment Act[13] mandates 'Any correctional official, dentist, homeopath, immigration official, labour inspector, legal practitioner, medical practitioner, midwife, minister of religion, nurse, occupational therapist, physiotherapist, psychologist, religious leader, social service professional, social worker, speech therapist, teacher, traditional health practitioner, traditional leader or member of staff or volunteer worker at a partial care facility, drop-in centre or child and youth care centre' to report when they suspect that a child has been abused 'in a manner causing physical injury, sexually abused or deliberately neglected'. Ordinary citizens are given the discretion to report abuse but are not compelled to do so in terms of section 110" (Hendricks, 2014, p. 1).

for the best interest of the child in its Sections 3 and 9. “In all actions concerning the care, protection, and well-being of a child the standard that the best interest of the child is of paramount importance, must be applied” (Children’s Act 38 of 2005). It is in the BIC for parents to monitor and protect their children from harmful food substances.

9.4.4 Parents ask the child to make their choice food

One of the core elements of children’s rights is the voice of the child in decision making at the household level. In this question, children reported their experience in decision making and food choices of the household. The result shows that about 45% compare 34% of children in Khayelitsha and Mitchells Plain respectively reported that their voice is always sought. More children in Mitchells Plain 25% compared to 20% of children in Khayelitsha reported that they are never consulted. The result is indicative of an area that needs policy attention. Such attention need not be legally binding but should be socially obligatory for child development in decision making as well as participation in the household decisions.

9.4.5 Developing the Best Interest of the Child Index

Table 9.2 presents the Best Interest of the Child index. The interpretation of the BIC will have to be looked at with case-specific responses of the children. Though generally, the average BICI was positive with a *πBICI=2.158,* the level of deviation of each BIC indicator determines whether the child’s best interest is being taken into consideration at the household level. The greater the deviation from the *πBICI,* the greater the child’s best interest is being considered. When the *mean=3* it indicates that a child’s best interest is ***always*** given consideration. A *mean* value of 2 signifies that the child’s best interest is **sometimes** considered. Overall, responses show that **Always**=43%, **Sometimes**=31%, and **Never**=26% perceive their right was being considered at the household level.

From Table 9.2, there was no indicator where the mean value was 3(Always). It emerged that about six indicators had BICI values of less than 2(Sometimes) for example. *The child eats late because food is prepared late (BICI=1.804).* In this response, a child was expected to answer with Never=1. Thus, this is acceptable because these indicators were not to be answered in the affirmative. When questions that needed affirmative answers have a negative deviation from the mean, it signifies that BIC is not being addressed in the child's opinion and when the BIC has a positive deviation from the mean for the non-affirmative question, the same was true. That is, the child's best interest is at stack. The closer the values are to the mean the closer the deviation from the best interest of the child.

Table 9-2 The Best Interest of the Child Index

Analysis of Best Interest of the Child Index (BICI)													
Determinants of Children's right	Always (43%)		Sometimes (31%)		Never (26%)		Total	TWV	BICI	BICIμ	BICI-BICIμ	Exact	Chi2
Child ask for food when hungry	261	76%	55	26%	28	8%	344	921	2,677	2,158	0,52	**0.02**	0.02
Child ask for food when there is food	195	57%	91	48%	58	17%	344	825	2,398	2,158	0,24	0.06	0.06
Child eats late because food is prepared late	56	16%	162	19%	123	36%	341	615	1,804	2,158	-0,35	0.21	0.21
Child's food is kept when child does not eat	234	68%	65	48%	44	13%	343	876	2,554	2,158	0,40	**0.00**	0.00
Child skip meals at home	179	52%	164	45%	1	0%	344	866	2,517	2,158	0,36	0.43	0.41
Child refuse to eat from neighbours	185	54%	150	26%	2	1%	337	857	2,543	2,158	0,39	0.33	0.25
Parents prevent child from eating from neighbours	162	47%	90	28%	91	27%	343	757	2,207	2,158	0,05	0.15	0.15
Parent stop child from eating fatty food	102	30%	93	26%	143	42%	338	635	1,879	2,158	-0,28	0.49	0.49
Child likes the food served	242	70%	89	39%	10	3%	341	914	2,680	2,158	0,52	0.15	0.15
Parents ask the child to make their choice food	129	38%	131	35%	80	24%	340	729	2,144	2,158	-0,01	0.08	0.07
Child feels hungry shortly after eating	51	15%	117	21%	170	50%	338	557	1,648	2,158	-0,51	**0.05**	0.05
Child's plate of food is small	53	15%	70	34%	211	63%	334	510	1,527	2,158	-0,63	0.21	0.21
Food is served when the child is no longer hungry	20	6%	107	48%	189	60%	316	463	1,465	2,158	-0,69	0.28	0.27
								732,6	2,157				

Source: Author's Analysis of empirical data

Since the objective was to understand the rights of the child from the voice of the child through the child's cognitive ability to understand their rights, some questions will have to be looked at from a reverse point of view. For example, a "Child eats late because food is prepared late". The BICI shows that there was a negative response from the respondents. The mean difference in BICI was -0.35. In this case there more negative the response, the more evidence that the BIC is being upheld in the household.

The BIC policy aimed to protect children from the socioeconomic effects of poverty and inequality. Though the majority of research has focused on protecting against child abuse, custody in the case of divorce, child trafficking, etc., little relevance is given to children's best interest when it concerns food access and food availability and more so food quality.

To assess the significance of the outcome for the study areas, a Chi-Square Test and Fisher Exact Test were compared and applied to test the difference between children of the two populations. First, a *t-test* of TWV by Gender showed that the mean TWV was not significantly different from the population mean indicating that children in similar circumstances are likely to respond the same. The test was also conducted to assess the mean difference TWV by Gender. The results show that the *mean* values were significantly different by Gender with a *P-value= 0.0104*. In addition, the was a difference of TWV for the two study areas with a $p<0.05$. There was no difference in TWV for households with children and households without children, obese and none obese children. However, three indicators of best interest were significant that is, *Child ask for food when hungry, Child's food is kept when the child does not eat and Child feels hungry shortly after eating.* This result shows that the BIC principle is not optimal in the study area as many of the indicators do not show any difference. Thus, given the circumstances, children in other urban townships in Cape Town are likely to report similar results. But it also shows that poor parents or households could be having challenges addressing the needs of the child since the majority are

either unemployed, uneducated, and depend on government social support. Whatever good intentions from parents and caregivers in these areas, their economic circumstances will always be a barrier to ensuring the BIC. though the rights of the child as classified in Appendix 3, these calibrated questions have been classified into 4 categories; Food availability, Access to food, Hunger and Malnutrition, and Parent role.

Several studies have contributed to the development of the rights of the child in the case of custody (Büchner-Eveleigh and Nienaber, 2012; Dawes, 2009; Detrick et al., 1992; Doek, 2019; Kaime, 2009; Kilkelly and Liefaard, 2019; Sloth-Nielsen, 2019). The avalanche of cases in this direction seems to suggest that the original purpose of Article 3 of CRC was to protect children in a family facing divorce. If that was the case then those who drafted the law should have coined its best interest of the child in divorce matters. To date, there is yet to be any court judgment relating to parental failure to protect the interest of the child in terms of food access and food availability. It is also not clear whether children can bring a lawsuit against their school or parents for not providing them with the right quantity and quality of food. Furthermore, children already suffering from obesity are likely to face various health challenges in the course of their life because of poor eating lifestyles inherited from their parents. Since there is not a clear standard in defining a child's best interest outside custody, the challenge of determining the BIC outside custody is greater. Besides, who should determine what is best for the child is also contentious. Albeit the development in the area of custody and the area of displaced children due to migration and other natural causes, it remains unclear how the best interest of the child is determined outside these circumstances.

The CRC seeks to protect the rights of the child and to ensure that the child's best interest in given greater consideration in any decision concerning the child. This is based on the premise that children are the most vulnerable in society and so need the highest form of protection. Children

are exposed to all kinds of risks whether they be health-related or socially related. Section 27 of the South African Constitution provides for the right to health care, social security, access to water, and the right to food and nutrition. The Constitution also made it mandatory for the government of South Africa to set aside resources to meet the needs of vulnerable children. In this context, the government has to design programs that identify vulnerable children and ensure that every child access to Sufficient food and water. Several measures have already been put in place to determine the BIC in the case of divorce, social protection but these measures are greatly limited in terms of access to food and obesity prevention amongst children. Furthermore, the voice of the child in many government policies on children's right to food is absent. Thought such in child custody a child's view seldom comes into perspective, such cases are rear both nationally and international may or otherwise, the voice of the child is absent (Semple, 2009). Developing a set of calibrated questions for children to ascertain whether children's right to healthy food is being met was critical in determining the likely outcome of child health from a child's perspective.

One of the key elements of the CRC is to ensure the social protection of the child. In doing to the Convention acknowledges the primary role of parents or legal guardians' development of the child (Article 18). This makes the burden care the sole responsibility of the child. In this study, social protection was access using the variable Parent Concern for the child (Cleophas, 2013). The government of South Africa is currently running one of the biggest social protection schemes in sub-Saharan Africa through its social assistance scheme- the Child Support Grant (CSG). Over 12 million children now benefit from cash transfer on a monthly basis. Evidence of the CSG in poverty alleviation has been widely applauded. However, the kind of protection contemplated in this study is far from being addressed or being recognised. This is critical for the welfare of the child.

9.5 Conclusion

The CRC has brought a substantial contribution to the protection and promotion of the rights of the child. The BIC framework has provided governments and civil society globally a framework for promoting children's rights regardless of the economic, social, and cultural background of the child. The African Charter on the Rights of the Child has flagged children's rights as a critical legal instrument for the protection and promotion of the rights of the child in Africa which does not discriminate against their culture, religion, and economic and political history.

This chapter has pointed out the historical development of the rights of the child and in particular the principle of the BIC. Taking cognisance of the challenges inherent in determining the rights of the child especially in marital disintegrations, the courts in South Africa have the vulnerability of children and have set up critical benchmarks for determining the BIC in such circumstances. This study also recognised the interventions made by the State in case of extreme poverty and established cash transfer schemes such as the CSG to help alleviate child vulnerability. However, the standards for determining the rights of the child outside custody circumstances are rear and sometimes completely absent or unrecognisable in social sciences. Given that the CRC and the South African Children Act declares the child's parent and family the default caregiver to protect and promote the best interest of the child, this chapter has presented a litmus test of the BIC outside of custody circumstances.

The aim of evaluating the BIC in urban townships in Cape Town in the context of child obesity was to understand the views of the children and to understanding how poor households are ensuring the BIC. Assessing the rights of the child to food and nutrition at the household level is very important in determining the BIC. The findings show that from the child's viewpoint the child's best interest is not optimal and for many of the best interest indicators, there was no significant difference between the two populations.

The study concludes that there is a need to develop a framework on the BIC outside of custody. Developing the Best Interest Standard from a social science perspective will improve monitoring and reporting currently carried by police, social workers, medical practitioner such as Doctors and nurses, teachers as provided under Section 110 of the Children's Amendment Act 41 of 2007. However, these studies have predominantly focused on issues regarding custody during divorce case cases, sexual abuse, and violence against the child. It seems to this researcher that there is no need to be concerned for the rights of the child if both parents are available, or when in the case of single-parent and caregiver or another family relative. The key point was that children's right to food should be sufficiently monitored at all levels of the family life albeit the challenges to facilitate such monitoring activity. Continuous research on the right of the child in terms of food choices and disease prevention and protection rather than treatment helps points to the rights of the child to better health outcomes.

There is a need for more policy reforms to support poor households and caregivers in ensuring food availability, food access, food affordability to overcome the scourge of hunger and malnutrition at the household level. This study has shown that a significant number of parents and caregivers are concern about the health of the child especially concerning what the child eats and its impact on the child's health. This chapter brings a close to the discussions of the research set out in chapter one. The next chapter concludes the arguments in this thesis, paying particular focus on the main findings, its contribution to knowledge, and proposed recommendations.

Chapter 10
CONCLUSION AND RECOMMENDATIONS

10.1 Introduction

This research was designed to assess the prevalence of overweight and obesity in adults and children living in Khayelitsha and Mitchells Plain. The research was set out to evaluate how the food choice of urban peripheral dwellers contributes to their health status outcome, measured using Body Mass Index (BMI), dietary diversity, and the population's socio-economic circumstances. The study builds on the concept of Human Rights to food and argued that the poor eating lifestyle of parents is a consequence of childhood obesity which impacts the Best Interest of the Child (BIC). The aim was to empirically explore the relationship between BMI and food choices of the poor. It also aimed at comparing the food choices of children by identifying the kind of food children eat at home and away from home and to evaluate the right to food in the context of the Best Interest of the Child.

The main objects were to identify the kinds of food that are consumed by urban peripheral dwellers, identify critical differences between the two population in the context of its socio-economic and health status, identify the relationship between food choices and self-perceived health status and actual BMI measurements; measure children food choices outside of the home and parental control; measure the association of food choices of children and adults in the household, Propose policy recommendation that response to child overweight and obesity in South Africa.

The study highlights the absence of a strong legislative framework that focuses on protecting adults and children from overweight and obesity and its association with NCDs. The lack of justice in the current policy framework exhibits the incapacity and lack of political will to address the obesity pandemic in South Africa. Applying the Theory of Justice as a fundamental principle

of Human Rights helps in our understanding of this lacuna of a strong legislative framework that could help the reduction and prevention of obesity thus enhance human dignity and wellbeing.

It is evident from this study that more than 60% of adults and 37% of children in the population sampled were overweight and obese. The results portray a strong indication of the risk of obesity-related diseases such as hypertension, dyslipidemia, T2D, heart disease, stroke, sleep apnoea as well as cancers of the endometrium, breast, prostate, and colon in urban peripheral townships in Cape Town. Women continue to show higher prevalence incidences compared to men thus indicating the need for a possible intervention mechanism that aims at reducing weight gain for women in particular. It was also found that from a race perspective, Coloured people were more likely to be obese compared to Black Africans thus changing the narrative that black Africans, are more susceptible to obesity.

The food choices of people living in the two areas are largely carbohydrate-based. There was evidence of low consumption of vegetables and fruits which are rich in micronutrients. The root cause of overweight and obesity amongst adults is multidimensional and needs continuous multidimensional approaches to underpin the key factors driving weight gain in South Africa especially in urban peripheral townships. Despite evidence of food choices in this study contributing to weight gain, the results are insufficient and inconclusive. This study found evidence of poor dietary diversity and eating lifestyle to be contributing to weight gain. The majority of households are not only financially poor but exhibits dietary poverty. Dietary patterns were found to be inconsistent and somewhat distorted and making it difficult to identify a clear pattern of whether food choices were completely cereal-based or protein-based. This evidence suggests that these communities, majority or who depend on social grants cannot afford food pattern that is evidence of a balanced diet.

10.1.1 Demographic profile

The study provides the demographic profile of the population in terms of gender, race, marital status, religion, and educational background. The results show that 43% of respondents were males and 57% were females. Female-headed households accounted for 51% of household heads compared to 49% of male-headed housed households. The study examines the sociodemographic and economic characteristics to understand how differences between the two population groups. The results also indicate that 40% of the population of Mitchells Plain earned above 4800 compared to 21% of households in Khayelitsha. In Khayelitsha, 51% of households earned just about R1200 a month. The majority of households depend on Social Grant. It was found that 68.45% of all who receive CSGs earn an income of R3600 an evidence high dependence on CSG as a safety net for poor households in South Africa. Household asserts was also used as a measure of poverty. The evidence from the results shows that poverty levels are no longer the same and show that there is evidence that one community is growing out of poverty.

The two regions were found to be significantly different from each other in terms of gender, education, employment, and access to social assistance. This new narrative of the population of people living in urban peripheral townships contributes to our understanding that there exist hidden levels of poverty and inequality within the marginalised and economically disadvantaged groups of people in South Africa. Black African were found to be more unequal in terms of their access to social services, access to food, and were highly associated with income inequality in the study. Measuring the significance of the population health status also showed that, though obesity was generally high in the study areas, People in Mitchells Plain - 99% Coloured, were likely to overweight and obese compared to Coloureds. This evidence is contrary to the popular narrative that Black Africans are prone to overweight and obesity.

In addition, it provides an understanding of the variation of former racially divided communities. The results showed a distinction between the population that was statistically significant. In this respect, govern needs to rethink its policies for poverty alleviation especially for the black population who remain most vulnerable in the social structure and economic inclusivity. In the next chapter, I attempt to establish a link between sociodemographic and economic characteristics on the health status and lifestyle food choices of the two population groups. The chapter proposed that policies related to the health status of urban peripheral dwellers need to be given greater attention, with evidently different dynamics on the ground, there is a need for a multistage approach in addressing the sociodemographic and economic challenges faced by vulnerable groups in South Africa.

10.1.2 Prevalence of BMI in Khayelitsha AND Mitchells Plain

Chapter six measures the prevalence of BMI in the study area. It is important to state that part of this chapter has been published. The chapter measured the prevalence of obesity amongst adults, assess the relationship between food choices and BMI. It further looked at the Dietary Diversity of the two populations and developed a food component derivative using principal component analysis. Identifying the prevalence of obesity in the study area, the study also investigated the population knowledge of obesity, and weight management strategies. The result of the prevalence of BMI in the study areas showed that the average BMI was 27kg/m^2, and indicates a population that is highly overweight. Overall, about 60% of adults sampled were overweight and obese. The results portray a strong indication of the risk of the increase in overweight and obesity in urban townships. When disaggregated, 28% were overweight, 16% were in their first stage of obesity, 11% were in stage two obesity and 9% were in stage three obesity.

About 57% of respondents ate fried food out of home at least once a week, while about 39% indicated eat fried food at home at least once a week. Also, 46% of respondents did not remove

chicken skin before eating chicken whereas, 35% do not remove any visible fat from any fleshy food types. Our findings showed a decrease in BMI when participants at the 75th percentile eat fast food once a month. This indicates that a drop in fast food consumption significantly reduces BMI at a *p-value of 0.042.*

From the result, 80% 0f the population has never been to the gym, physical exercise through walking to the shop was 23%. Just about 17% of the population indicated have never walk to shop, 9% seldom walk to shop, and 4% often walk to shop. About 45% of the population use dancing as a weight management practice. The evidence suggests that urban peripheral communities may not be aware of the risk of obesity and that concerted and personal efforts need to be made to reduce their chances of obesity.

10.1.3 The risk of children eating away from home

The objective of chapter seven was to assess the food choices of children living in urban townships in Cape Town. The chapter provided the demographic profile of children in the study area. From the population surveyed, there 586 children aged 5 to 11 years. This constitutes 13 % of the sample. About 53% of households have at least one child. Male children were 45% and 55%, female. Children within the age group are most likely to be in school. The results show that 18% were in Grade R while 69% were already in primary school, that is, between Grade 1 and Grade7. The evidence shows more 5years olds children were found in the household (19.73%) in Khayelitsha and just about 9% in Mitchells Palin with a *P-value of <0.05* significant level.

In relation to food access, one of the key objectives of this study was to identify the kind of food that children eat and whether these choices were made out of home or at home level. The result indicates that 68% of children reported that they buy food at school or on their way to school. Over 83% stated that their parents gave money to take to school. There was a significant association between children buying food and parents giving money at X^2 *91.4643, P<= 0.000.*

Thus, though children have a rationale choice to make in terms of what they buy, these are motivated by what their parents give them. We assess in the table below the items that children buy at school or out of school. Children in Mitchells Plain were more likely to eat healthily compared to children in Khayelitsha.

Of the sample of children, 17% were stunted, 24% were overweight and obese. The study also found a strong association between BMI and children's self-perceived health status. About 56% of the children visualise themselves as overweight and obese. Given the risk of obesity on children, the study assesses children's food choices at home and out of the home. It also examined the role of parents in influencing children's food choices in children that children buy without parental control and it possible implication on child health status. In the view of this researcher, there are two possible outcomes of the phenomenon of children eating out of parental control. In the first instance, given money to children for food purposes could be a strategy of parents to overcome child hunger. On the other hand, children can become more vulnerable to eating unhealthy food out of the home environment. In this analysis, the type of food children eat at home was measured using a 24h recall. Though there are certain limitations to the use of this methodology, 24h recall is advantageous in giving a synoptic view of what households and individuals eat or are likely to eat on a balance of probability. It was found that 39% of children in the sample had DDS of <4 which is below the national average. Low dietary diversity has often been an indicator of hunger and malnutrition at the household level.

10.1.4 The best interest of the child

The study assessed the BIC policy in South Africa in the context of children's access to food. The main objective was to interrogate how the current policy of BIC response to the problem of child obesity in children. The findings are evidence of the prevalence of overweight and obesity in poor communities, poverty, and inequality. Enhancing the right to food, and developing an

appropriate enforcement mechanism to address the problem of child obesity especially amongst poor and malnourished children is vital. The international legal framework for the protection of the rights of the child has had a far-reaching impact on protecting vulnerable children worldwide. Children are protected under the Universal Declaration of Human Rights, Convention on the Rights of the Child (CRC), International Covenant on Economic, The African Charter on the Rights of the Child, the South Africa constitution of 1996, and the South African Children's Act 38 of 2005. These legal frameworks have brought a substantial contribution to the protection and promotion of the rights of the child. However, despite these international and regional, and national instruments for the protection of the rights of the child, children still suffer from poverty, malnutrition, and overweight and obesity. Children still lack access to basic nutrition. About 47% of households still depend on government social grants. About 72% of children in the households that receive the one form of a grant or the other.

One of the measure contributions of the study was the development of an index to measure children's right from the voice of the child using a set of calibrated questions to assess the level of children's right to food at household levels. It found that 43% of the children said Affirm their right to food, 31% said sometimes their right is being considered and 26% said their best interest is not being considered. Three indicators of best interest were significant that is, *Child ask for food when hungry, Child's food is kept when child does not eat and Child feels hungry shortly after eating.*

However, despite these important instruments, enforcement of the right of the child remains a major challenge.

Furthermore, the challenge of enforcing the rights of the child and in particular the BIC is prevented by challenges inherent in determining the rights of the child especially. In the case of marital disintegrations, the courts in South Africa have the vulnerability of children and have set

up critical benchmarks for determining the BIC in such circumstances. This study also recognised the interventions made by the State in case of extreme poverty and established cash transfer schemes such as the CSG to help alleviate child vulnerability. However, the standards for determining the rights of the child outside custody circumstances are rear and sometimes completely absent or unrecognisable in social sciences. Given that the CRC and the South African Children Act declares the child's parent and family the default caregiver to protect and promote the best interest of the child, this chapter has presented a litmus test of the BIC outside of custody circumstances.

The aim of evaluating the BIC in urban townships in Cape Town in the context of child obesity was to understand the views of the children and to understanding how poor households are ensuring the BIC. Assessing the rights of the child to food and nutrition at the household level is very important in determining the BIC. The findings show that from the child's viewpoint the child's best interest is not optimal and for many of the best interest indicators, there was no significant difference between the two populations.

The study concludes that there is a need to develop a framework on the BIC outside of custody. Developing the Best Interest Standard from a social science perspective will improve monitoring and reporting currently carried by police, social workers, medical practitioner such as Doctors and nurses, teachers as provided under Section 110 of the Children's Amendment Act 41 of 2007. However, these studies have predominantly focused on issues regarding custody during divorce case cases, sexual abuse, and violence against the child. It seems to this researcher that there is no need to be concerned for the rights of the child if both parents are available, or when in the case of single-parent and caregiver or another family relative. The key point was that children's right to food should be sufficiently monitored at all levels of the family life albeit the challenges to facilitate such monitoring activity. Continuous research on the right of the child in terms of

food choices and disease prevention and protection rather than treatment helps points to the rights of the child to better health outcomes.

There is a need for more policy reforms to support poor households and caregivers in ensuring food availability, food access, food affordability to overcome the scourge of hunger and malnutrition at the household level. This study has shown that a significant number of parents and caregivers are concern about the health of the child especially concerning what the child eats and its impact on the child's health. This chapter brings a close to the discussions of the research set out in chapter one. The next chapter concludes the arguments in this thesis, paying particular focus on the main findings, its contribution to knowledge, and proposed recommendations.

10.1.5 Recommendation

Price is often reported as a barrier to the purchase and consumption of healthy foods. *Hence, it is recommended that* strategies that increase incentives for purchasing healthier food options be pursued. Consumer awareness and Programmes that focus on reducing the risk of obesity needs to be put in place in poor communities to address the problem of obesity. In addition, as discussed in this study, to prevent obesity, the multi-sectoral population-based action is required, targeting the most vulnerable group of people. Establishment of weight management centers or facilities in poor communities that are accessible and without cost or at very low prices to promote weight management will make a substantial contribution to obesity reduction. Establishing community knowledge forums to share the risk of obesity, develop training workshops as intervention strategies with price motivation will enhance community awareness of the risk of obesity through knowledge awareness programs.

10.1.6 Further Research

This study has raised various issues of concern in the fight against overweight and obesity in poor households in Cape Town South Africa. The study provided sufficient evidence of the

prevalence of overweight and obesity in association with food choices Khayelitsha and Mitchells Plain. However, how the right to nutrition translates to healthy eating for children in poor communities is not clear. Government policy School feeding Programme is limited to the School environment and therefore what happens outside the school environment concerning what the child eats is out of control. Also, children who are not attending any formal education are left out of the policy of SFP. No policy framework exists that focuses on non-school going children in terms of food and nutrition security besides the CSG. How knowledgeable are poor households about the BIC, and what are the possible mitigating strategies that poor households in present South Africa can adopt to promote and protect the rights of the child. Finally, the Best Interest of the Child Index developed in Chapter 9 only provides a synoptic view of how children view their right to food. Given the fact that the sample was small, there is a need for a more representative sample and more comprehensive questions from both children and parents that can help inform and at the same time measure the magnitude of the implementation of the BIC in South Africa.

10.1.7 Scholarly Contributions

This dissertation presents several scholarly contributions worth highlighting. First, the research was an empirical exploration of the relationship between BMI and food choices in Khayelitsha and Mitchells Plain, using a representative sample of the population. The research shows the socioeconomic changes that have occurred in the Khayelitsha and Mitchells plain indicating that policies that still classify the two populations as equals need to be revised based on the significant differences presented in this dissertation. Secondly, it reinvigorates the case for the fight against overweight and obesity in urban townships in South Africa given that over 60% of the population of adults were overweight and obese, and 37% of children identified as being overweight and obese. Thirdly, the research introduced a quantitative approach in evaluating the rights of the child through the development of an index to measure children's right to food. It further evaluated

the Best Interest of the Child policy and showed that social sciences approach in determining the Best Interest of the Child in terms of access to food and nutrition could complement the decisions of the courts and provide credible evidence to reconstitute policies in determining children's right to food in South Africa**.**

10.1.8 Wrap-up

Given that children were deprived under the apartheid system to have access to basic food and nutrition needs, the current sociopolitical terrain of South Africa has made it possible for children to have the right to access healthcare, healthy eating under the constitution, and the Children's Act. However, these rights have remained limited in addressing some of the gaps in its implementation. Children from poor communities and poor households are the most vulnerable to unhealthy food choices. The onus of who decides what is best for the child rest on the parent or caregiver of the child. In a community where poverty and inequality remain endemic, it is difficult to ascertain in the present circumstances of unemployment and dependence on CSG, whether parents and caregivers can guarantee the BIC in terms of healthy food choices. Where parental control is limited as regarding children buying food for themselves, it becomes practically impossible to institute the BIC. It is no longer the need for law, but how these international instruments are implemented and enforced to protect children against overweight and obesity.

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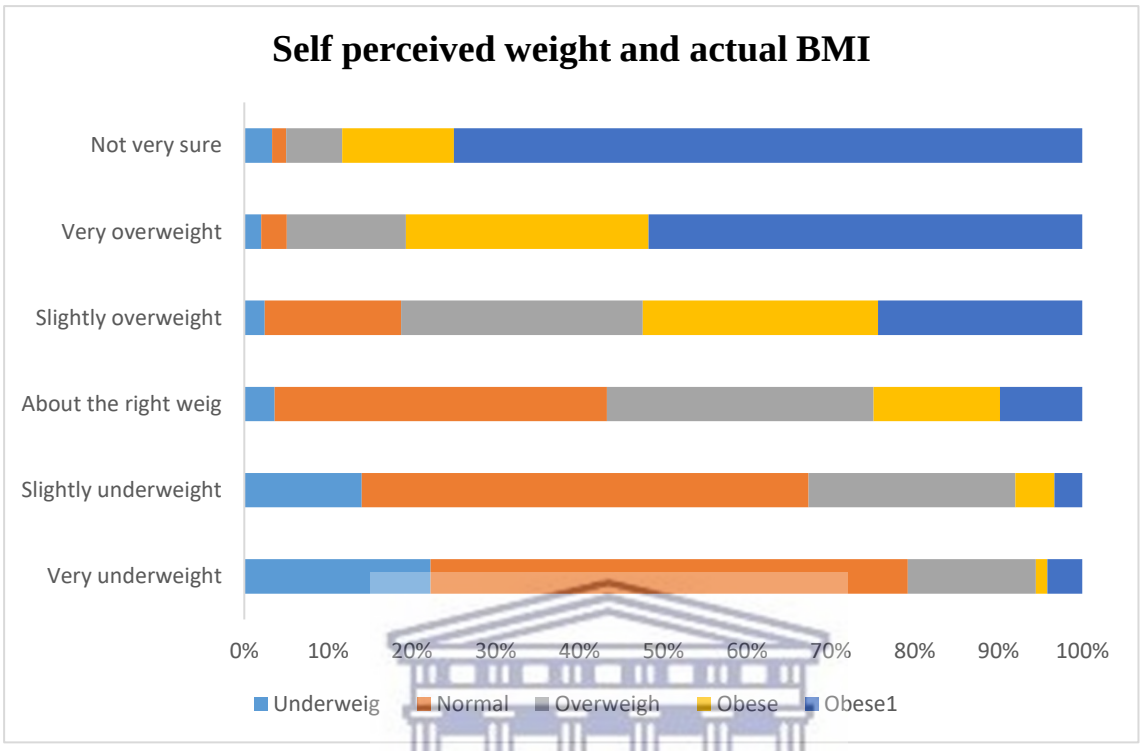
Universal Islamic Declaration of Human Rights, 1981

Appendixes

Appendixes 1: Self perceived weight and actual BMI



Appendixes 2: Multivariate Quantile Regression of the Association of BMI, Socioeconomic status

Multivariate Quantile Regression of the Association of BMI, Socioeconomic status, and eating lifestyle of people living in Khayelitsha and Mitchells Plain, Cape Town						
	Q5	**Q10**	**Q25**	**Q50**	**Q75**	**Q90**
	Coef	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**
Gender	.33	1.23**	.80	.33	-.47	-1.08
Age	.2717094**	-.01	-.02	-.05**	-.04	.27
Marital Status						
Married	.74	1.28*	.09	.74	-.11	-.39
Cohabiting	-1.22	1.81	-.30	-1.22	2.80	3.70
Divorce	2.34	2.40**	1.40	2.34	-.49	.92
Widowed	.38	-.263	.73	.38	1.06	-.43
Highest Education						
Primary	3.22	-1.11	1.86	3.22	4.86**	4.82
Secondary	.68	-1.89	.10	.68	2.51	2.70
Technical college	3.45	-.89	2.03	3.45	4.12**	1.51
Tertiary (university)	.63	.42	.37	.63	3.14	4.10
Race						
Coloured	-.41	.56	-.55	-.41	-.12	.561
Eating Habits: Fast Food						
One's a Month	-1.84	.47	.05	-1.84	-1.99**	.59

Once every two weeks	-2.41	-.39	-1.09	-2.41	-2.05	.75
1-3 times per week	-2.58	.49	-1.03	-2.58	-2.22*	1.71
4+ times per week	-2.81	.28	.93	-2.81	-2.30	3.25
Eat fruits	3.26	-.17	2.50**	3.26**	-2.07	-2.48
Eat vegetable	1.38	-.68	-.56	1.38	2.83	6.56**
Eat Fried food outside	.011	.208	-.09	.01	-.41	-.63
Eat Fried Food home	-.58	.09	.43	-.58	-2.27**	-.80
Remove fat	-.067	.26	.97	-.06	-.04	-.30
Remove Chicken Skin	-1.38**	-1.08**	-1.42**	-1.38**	-2.24**	-1.73
Fat and Sausages	-.101	-.28	-.14	-.101	-.69**	.04
Fish, Sugar	-1.16**	-1.06**	-.93**	-1.16**	-.38	-.95
Vegetables beverages	-.70	-.72	-.32	-.70*	-.18	-.12
Meat	.18	.82**	.31	.18	-.01	.16
White Roots	-.29	-.54	.36	-.29	-.093	.22
Fruits	.97	-.39	.60	.97	.38	.89
Fat and Sausages	.36	-.08	-.32	.36	-.50	-1.16**
*p<0.05, **p<0.01						

Appendix 3 Children perspective of the BIC

BIC Test: Children perspective			
Food availability	**Access to food**	**Hunger and Malnutrition**	**Parent role in Protection**
Parental role in BIC	Child ask for food when there is food	Child ask for food when hungry	Parents prevent child from eating from neighbours **(Protection)**
Child ask for food when hungry	Child eats late because food is prepared late	Child feels hungry shortly after eating	Parent stop child from eating fatty food
Child ask for food when there is food	Child refuse to eat from neighbours	Food is served when child is no longer hungry	Parents ask child to make their choice food
Child eats late because food is prepared late	Parents prevent child from eating from neighbours	Child feels hungry shortly after eating	Food is served when child is no longer hungry
Child's food is kept when child does not eat	Child's plate of food is small	_	_
Child skip meals at home	_	_	_
Child refuse to eat from neighbours	_	_	_
Child likes the food served	_	_	_
Child's plate of food is small	_	_	_

Appendix 4 Actual and Perceived BMI of Children

Actual and Perceived BMI of Children				
	Underweight N=13	Normal Weight N=92	Overweight & Obese N=52	Pooled N=152
Excellent	23%	51%	46%	47%
Very Good	15%	14%	12%	13%
Good	54%	27%	31%	31%
Fair	8%	7%	4%	6%
Poor	0%	1%	8%	3%