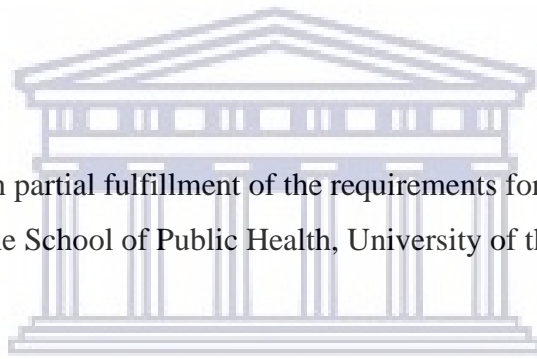


Determining food and nutrition literacy of community health workers in the Western Cape, South Africa

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A mini thesis submitted in partial fulfillment of the requirements for the degree of Master in
Public Health at the School of Public Health, University of the Western Cape

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Keywords: Obesity, Non-communicable diseases, Food literacy, Nutrition literacy, Body
image, Body mass index, Women, Community health workers, low and middle income,
Adults

DECLARATION

I, Asiphe Ketelo, declare that the thesis entitled: “Determining food and nutrition literacy of community health workers in the Western Cape, South Africa” is my own work, and it has not been submitted for any degree or examination in any other university. All the sources I have used or quoted have been indicated and acknowledged by complete references



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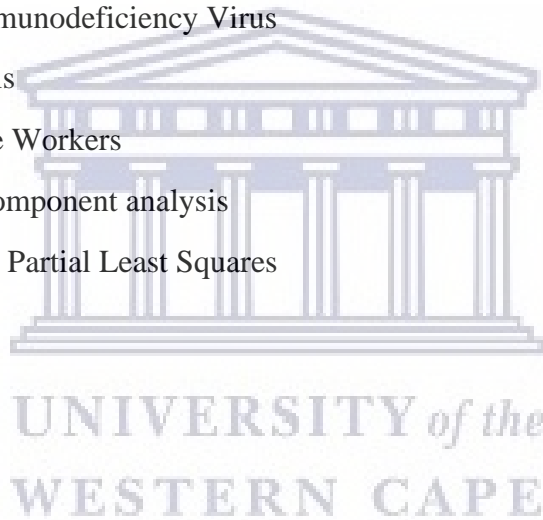
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ABBREVIATIONS

CHW	Community Health Workers
BMI	Body Mass Index
CVDs	Cardiovascular Diseases
LMIC	Low- and Middle-Income Countries
NCDs	Non-Communicable Diseases
SA	South Africa
SES	Socio-Economic Status
SPSS	Statistical Package for the Social Sciences
WHO	World Health Organisation
HIV	Human Immunodeficiency Virus
TB	Tuberculosis
HCW	Health Care Workers
PCA	Principal component analysis
OPLS	Orthogonal Partial Least Squares



ABSTRACT

Background: Obesity is one of the critical problems that threatens not only health, but the economy at a global level. Among the factors associated with obesity is less than optimum level of nutrition literacy. Nutrition literacy is more than just the food knowledge, it is a combination of other essential factors that help individuals to maintain healthy a body size. These factors include the selection and consumption of nutritious food; acquiring knowledge and skills in the areas of meal planning and preparation; as well as using and knowing how to read food labels correctly.

Aim: The main aim of the current study was to investigate the level of nutrition literacy and its association with food knowledge and body mass index (BMI) among community health workers (CHWs) in three townships of Cape Town, in the Western Cape province of South Africa.

Methodology: This quantitative descriptive cross-sectional study was conducted among 96 female CHWs who were 25 years and older and hired by a non-profit organisation. Calibrated measuring scales and height meters were used to measure body weight and height of the CHWs and these were used to calculate BMI. A previously validated questionnaire was used to ascertain data on food knowledge, behaviours for maintaining healthy BMI and sociodemographic information. Descriptive data were analysed using SPSS version 25 and are presented as percentage and mean \pm SD. Multivariate data analyses were conducted using SPSS and SIMCA version 15 software, focusing on principal component analyses (PCA) and orthogonal partial least squares (OPLS). Significance is therefore determined by p-values that are less than 0.05 and confidence intervals that do not overlap, or those that do not include zero.

Results: The majority (81%) of CHWs were Black South Africans with high school education. About 60% of the CHWs were within the ages of 35 and 54 years. Over 70% of the CHWs were obese and 18.9% were overweight. Forty-four and 47% of the CHWs had average and acceptable levels of food knowledge, respectively. More than 50% of the CHWs reported that they drafted grocery shopping lists, planned their meals ahead of time, and cooked their own meals frequently. Most (63% and 75%) of the CHWs reported frequent use and understanding of food labels, respectively. More than 45% reported risky eating behaviours such as consumption of fizzy beverages, with some suggesting engaging in these behaviours more than once daily. For PCA, the overall percentages of variation that were explained and predicted by

the model were 13% ($R^2X = 0.13$) and 10% ($Q^2X = 0.10$), respectively. According to the OPLS outcomes, the only factor that was associated with the BMI was the consumption of fresh fruit. Race, age, creating healthy meals from leftovers, as well as the consumption of whole grain vegetables and fizzy drinks were associated with CHWs' food knowledge.

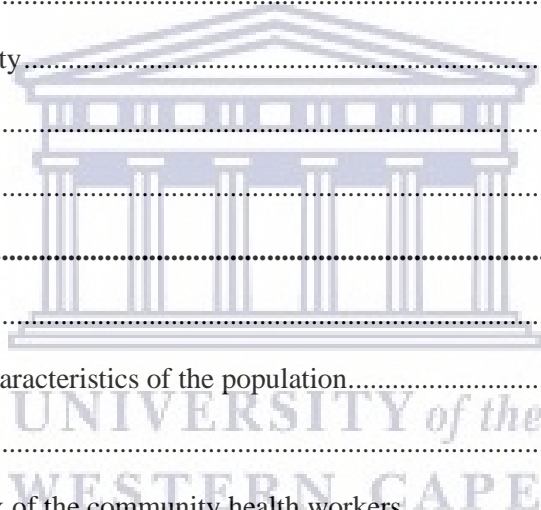
Conclusion: Less than 50% of the CHWs had acceptable food knowledge. Even though more than 50% seemed to have acceptable levels of nutrition literacy, this was not enough for them to maintain healthy BMIs. This has a public health implication since CHWs are an important source of health education for many South African community members. Urgent scaling-up of targeted interventions that will encourage CHWs to maintain healthy BMIs and improve their food and nutrition literacy is needed. These interventions could be in the form of education entertainment and could include comic booklets and digital storytelling. These can be distributed via many media platforms that are accessible to CHWs at all times.



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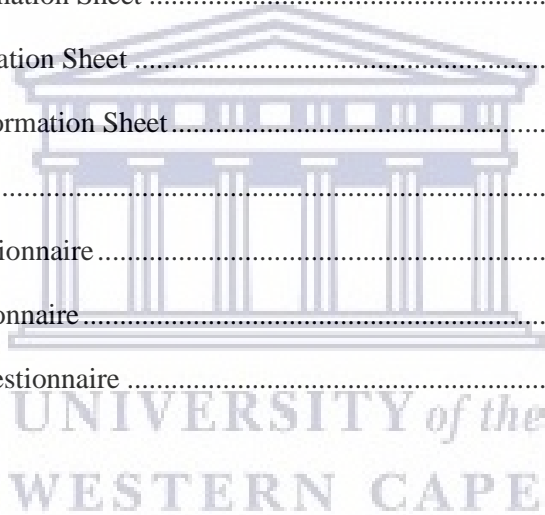
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CHAPTER 1: INTRODUCTION

1.1 Introduction

The world is currently battling with the rise in the prevalence of obesity (Ford, Patel and Narayan, 2017). Obesity was once seen as the problem of the affluent and was mostly prominent in the developing world (Ford, Patel and Narayan, 2017). However for the past few decades low-to-middle income countries (LMIC), including South Africa have been undergoing rapid and unplanned urbanization (Micklesfield *et al.*, 2013; Ng *et al.*, 2014; Seidell and Halberstadt, 2015). This has led to people in these countries adopting unhealthy lifestyles, among them being unhealthy food choices and nutrition behaviors (Micklesfield *et al.*, 2013). This has resulted in a dramatic increase in the prevalence of obesity in these countries such that it threatens overtaking the prevalence of obesity in high income countries (Felix and Jean-Claude, 2009; Ng *et al.*, 2014). The significant rise in obesity prevalence in these countries has been noted across all age groups, among children, adolescents and adults; with females having higher prevalence than their male counterparts (Robinson *et al.*, 2009; Pereira *et al.*, 2018). The statistics published by the World Health Organization (WHO) in 2016 estimated that approximately 39% of adults were overweight (with women at 40% prevalence and men at 39%), and approximately 340 million children and adolescents were overweight and obese (World Health Organisation, 2018). Recent similar evidence (National Department of Health *et al.*, 2017) suggests that in South Africa among those aged 15 years and older, approximately 24.8% and 39.2% females were overweight and obese respectively, while males were at 20.1% and 10.6% of males were overweight and obese respectively.

International evidence suggests that several socio-environmental factors contribute to the increased obesity prevalence in developing countries (Kearney, 2010; Hruby and Hu, 2015; Ronquest *et al.*, 2015). Some of these factors include economic development, urbanization, globalization and trade liberalization (Hruby and Hu, 2015). These have led to the nutrition transition which resulted in shifts in the diet of people from nutrient dense to energy dense (i.e. food high in fat, refined carbohydrates and added sugar) and processed foods, as they move from rural to urban areas (Kearney, 2010; Ronquest *et al.*, 2015).

Apart from the afore-mentioned socio-environmental factors, it is vital to note that individual behavioral factors are also a concern, as they are implicated in the increase in prevalence of

overweight and obesity (Affenito *et al.*, 2012). There are two major individual behavioral factors that have been highlighted as major concern in previous studies, one being unhealthy eating habits and the second being inadequate physical activity (Duncan *et al.*, 2011; Chang *et al.*, 2014; Ssewanyana *et al.*, 2018).

Obesity has major effects on human health. People that are overweight and obese are at a higher risk of developing non-communicable diseases (NCDs) such as diabetes, hypertension, heart diseases and certain cancers (Leitner *et al.*, 2017). Research has shown that there is an association between obesity and NCDs (Leitner *et al.*, 2017). Non-communicable diseases are now among the leading causes of mortality and morbidity in the world and in some of developing countries such as South Africa (Boutayeb and Boutayeb, 2005; Chan, 2010). This not only affects health, it has more implications for the global economy as a large proportion of health budgets is now directed to treat NCDs (Tremmel *et al.*, 2017).

Meal planning, meal preparation, eating behaviors and the use of food labels are some of the critical factors that contribute to food and nutrition knowledge, a critical determinant of obesity in individuals (Truman, Lane and Elliott, 2017). Scientists and researchers have combined these factors and termed them as food and nutrition literacy. For instance, Vidgen and Gallegos (2013) defined food and nutrition literacy as the individuals' ability to make good nutritious food choices, their ability and a skill to plan, select and prepare nutritious meals as well as the knowledge on how much food should individuals eat.

In 2010 the World Health organization (WHO) endorsed the global strategic plan for the prevention and control of NCDs between 2013–2020 (World Health Organisation, 2015). This included a guideline for countries to scale up timely interventions, including improving diet and nutrition behaviors of their citizenry. This was projected to help in the prevention and control of obesity and its consequences (i.e. NCDs) at the general population level in these countries. Among the targets mentioned in the WHO (2015) guidelines is improving capacity of health service providers to enable them to tackle obesity and NCDs. However, there is a shortage of skilled health workers in LMICs, such as South Africa (Naicker *et al.*, 2009; Tsolekile, Abrahams-Gessel and Puoane, 2015). As such, community health workers (CHWs) are regarded as the best human resource providing necessary health services in these countries (Tsolekile, Abrahams-Gessel and Puoane, 2015). Hence, improving capacity of CHWs to tackle obesity and nutrition related issues could be the foundation of responding to the aforementioned WHO (2015) strategic call. Doing this may significantly improve the health of people in LMICs, since

CHWs serve the communities directly and are a trusted source of health information in these communities (Egbujie *et al.*, 2018).

In fact, there is substantiated evidence to suggest depleted health knowledge of CHWs operating in the poorer townships of South Africa (Hughes, Puoane and Bradley, 2006; Tsolekile, Schneider and Puoane, 2018). To our understanding, the capacity of these CHWs to tackle obesity and nutrition related issues in these townships has not yet been established. In fact, the body size related issues and food and nutrition literacy of these CHWs have never been researched. Hence, the need for the proposed study, that aims at exploring body size and food and nutrition literacy among CHWs operating in the poorer townships of South Africa.

1.2 Problem Statement

More than 70% of South African women and 39% of the men are either overweight or obese (National Department of Health *et al.*, 2017). Most overweight and obese women are residents in poorer and non-white communities (i.e. peri-urban townships) (Micklesfield *et al.*, 2013). In these communities overweight and obesity development is mediated by socio-economic, cultural (ethnic) and environmental factors (Micklesfield *et al.*, 2013). Overweight and obesity are associated with an increased risk of NCDs such as hypertension, some forms of cancers, diabetes and coronary heart diseases (Nyberg *et al.*, 2018). The South African government has outlined strategies for the control and the prevention of obesity and NCDs (South African Ministry of Health, 2013). Moreover, targeting modifiable risk factors for obesity and NCDs (e.g. improving food and nutrition knowledge, reducing people's body size and curbing other behavioral lifestyles such as physical activity, smoking and binge drinking) have been cited as the most cost effective way to address these epidemics (Manning, Senekal and Harbron, 2016; Branca *et al.*, 2019).

South Africa and other developing countries adopted a culture of working with some community members, (known to be Community Health Workers) as a solution to overcome the shortage of human resources (People's Health Movement, 2019). In South Africa, CHWs became popular at the time when there was large numbers of HIV and TB cases emerging and their main role was to link patients to care and treatment. Their scope of work has been extended since then as they became more involved in other health awareness areas such as conducting education on general well-being and getting involved in nutrition and maternal and child health (Languza and Lushaba, 2011). It is vital to note that CHWs are not professional qualified health workers,

however they do get short term training on various health interventions (Tsolekile, Schneider and Puoane, 2018). As they are vital members of the community that are trusted by their communities to provide support and advice, it is important to ensure that they are well equipped and informed on health aspects (Languza and Lushaba, 2011). However, the available literature doesn't clearly show how equipped and informed CHWs are in giving advice, specifically related to food, nutrition and NCDs.

Moreover, health workers that operate in low and middle-income communities (specifically CHWs) in these setting are not immune to obesity and NCDs. There is substantiated evidence (Iwuala *et al.*, 2015; Singh and Purohit, 2016; Phetla and Skaal, 2017) that suggests they have a high body mass index (BMI). It therefore becomes important to understand the factors that predispose these CHWs to obesity and NCDs, with special focus on understanding their level of food and nutrition literacy.

1.3 Rationale

The purpose of this research was to obtain an understanding of knowledge and skills of CHWs regarding food and nutrition literacy. Among the population that the CHWs serve, are patients that have been diagnosed with chronic illnesses and the assumption is that the CHWs need to guide and advise their clients on diet. However, little is known on their capacity to do so. The knowledge that has been generated through this study will add to the body of literature on CHWs, obesity and NCDs in disadvantaged communities of South Africa. It will also help in planning and refining interventions that are aimed at equipping CHWs with skills to reduce the prevalence of obesity.

1.4 Aims and Objectives

1.4.1. Aim

The main aim of the current study was to investigate the level of nutrition literacy and its association with food knowledge and BMI among CHWs in three townships of Cape Town, in the Western Cape province of South Africa.

1.4.2. Objectives

1. To determine the BMI of CHWs in the Western Cape townships in South Africa
2. To determine the level of food knowledge among CHWs in the Western Cape townships in South Africa
3. To determine nutrition related behaviours for maintaining healthy BMI (also known as nutrition literacy; presented as meal planning, food preparation, food consumption, and

the use of food labels) among CHWs in the Western Cape townships in South Africa

4. To determine the association between the BMI, food knowledge and nutrition literacy among CHWs in the Western Cape townships in South Africa

1.5 Research questions

1. What is the BMI of CHWs in the Western Cape townships in South Africa?
2. What is the level of food knowledge among CHWs in the Western Cape townships in South Africa?
3. What is the level of nutrition literacy in CHWs in the Western Cape townships in South Africa?
4. Is there an association between the BMI, food knowledge and nutrition literacy of CHWs in the Western Cape townships in South Africa?

1.6 Research Outline

Chapter 2: Literature review

This chapter focuses on reviewing the published available literature of obesity, food knowledge, nutrition related behaviours and CHWs. For this chapter Pub Med and google scholar were used to attain recent relevant publications.

Chapter 3: Research methodology

This chapter focuses on research methodology of this study which includes study design, sample size, the data collection used, type of analysis conducted, the validity and reliability of the study as well as the ethical considerations

Chapter 4: Results

This chapter focuses on the findings of the research and tables and figures are used to present findings.

Chapter 5: Discussion

This chapter focuses on discussing the findings of the study, corroborating and contrasting these findings with relevant literature

Chapter 6: Conclusion and Recommendation

This chapter focuses on the conclusion of this study and further focuses on recommendations for future studies.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This section will focus on reviewing available literature on obesity prevalence (globally, regionally, nationally and amongst health workers), knowledge and behavioural factors that contribute to the rise in obesity prevalence namely: nutrition knowledge, food and nutrition literacy, meal planning, food selection and preparation, dietary behaviors, and as well as the importance of improving food and nutrition literacy and body size of CHWs.

2.2 Prevalence of obesity

2.2.1 Global Prevalence of Obesity

Obesity is one of the critical health concerns that overwhelms the health sector across the globe (Siddiqui, 2003; Ameye and Swinnen, 2019). In the past three decades, major shifts in obesity prevalence have been noted throughout the world (Swinburn *et al.*, 2019). During the 1980's obesity was mostly prominent in the high-income countries where people lived sedentary lifestyle. However, according to the studies that have been done to track shifts of global prevalence in the world there is sufficient evidence that the prevalence of obesity has increased immensely in the developing and under developed countries in the past decades (Malhotra *et al.*, 2008; Bhurosy and Jeewon, 2014; Ford, Patel and Narayan, 2017). According to Finucane *et al.* (2015, p. 8) the prevalence of overweight and obesity was estimated at almost 1.5 billion among adults in 2008. The systematic analysis study conducted by Ng *et al.* (2014, p. 6) also shows evidence that there has been global increase in the prevalence of overweight and obesity between 1980 and 2013 from 921 million to 2.1 billion. This study showed that in developed countries the prevalence of overweight and obesity mainly increased in males, whereas in developing and underdeveloped countries it mainly increased in females. Some of the regions such as American and European regions had the highest increase in overweight and obesity between 1980 and 2015 while other regions have doubled (such as the African region) have doubled and tripled their overweight and obesity prevalence between these years (Chooi, Ding and Magkos, 2019).

2.2.2 Prevalence of obesity in Africa

Africa is among some of the regions that has had a tremendous increase in obesity prevalence since 1980 (Ng *et al.*, 2014). In the past, major health problems faced in this region were due to undernutrition, however, today, NCDs are among some of the leading causes of mortality and morbidity in this region and obesity is one of the major risk factors that is contributing to this (Bigna and Noubiap, 2019; Gouda *et al.*, 2019; Wallace and Pentz-Kluyts, 2019). Obesity prevalence in most countries in Sub-Saharan Africa has increased, however, these increases are mostly recognized within the urban areas of Southern African countries (Afolabi, Addo and Sonibare, 2004; Abubakari *et al.*, 2008; Adeboye, Bermano and Rolland, 2012; Agyemang *et al.*, 2015; Ford, Patel and Narayan, 2017). The study conducted by Agyemang *et al.* (2015, p. 3) showed that the African regions that have had the highest increase in obesity prevalence between 1990 and 2015 were the Southern African region (prevalence from 6.4% in 1990 to average of 21% in 2015) and Northern Africa which had a prevalence of 7.5% in 1990 to 13% in 2015. This study along with other studies conducted in the African region noted that the increase in prevalence of obesity was higher in females than in males in this region (Abubakari *et al.*, 2008; Agyemang *et al.*, 2015).

2.2.3 Obesity in South Africa

With the advent of democracy in South Africa in 1994, there was a spike in the migration of people from rural to urban areas in search of opportunities to secure better income (Mlambo, 2018). These people have settled in poorer townships that sometimes lack the most basic facilities (Mlambo, 2018). They have therefore undergone changes to their lifestyle that have been characterized by shifts in their dietary patterns from traditional (nutrient-dense) diets to obesogenic (high sugar and salt, while low in fiber) diets, as well as a reduction in energy expenditure (Nnyepi *et al.*, 2015). These lifestyle changes have impacted their nutritional status as evident in the anthropometric transition in South Africa. For instance, while underweight has decreased in all population groups of South Africa in recent years; the overall prevalence of overweight and obesity has increased by 3% in men and 13% in women between 1998 and 2016 (from 28% in men and 55% in women to 31% in men and 68% in women, respectively (National Department of Health *et al.*, 2019). Moreover, while obesity has increased in all geographic locations, it has been doing so at a faster rate in urban compared to rural areas. Between 1998 and 2016, in rural areas, the obesity prevalence increased from 6.2% to 6.8% in men, and from 24.5% to 39.2% in women (National Department of Health *et al.*, 2019). In urban areas, an

even bigger increase has been shown for the same time period, where the prevalence of obesity has increased from 10.9% to 13.3% in men, and from 32.4% to 42.2% in women (National Department of Health *et al.*, 2019) .

However, it is also important to note that the increase in the prevalence of obesity in South Africa is heterogeneous and uneven across population groups as influenced by genetics (especially age and gender) (Yako *et al.*, 2015). In fact, being a female and black, as well as older in South Africa increases the risk of being overweight and obese (Meyiwa *et al.*, 2014).

2.2.4 Obesity in health workers

Several studies that have been conducted amongst healthcare workers in South Africa shows that evidently healthcare workers have a high prevalence of overweight and obesity (Puoane *et al.*, 2005; Onyebukwa, 2011; Phetla and Skaal, 2017). A study by Phetla and Skaal in one of the provinces (Mpumalanga) in South Africa found that more than half Health Care Workers (HCWs) were obese and about 21% were overweight (Phetla and Skaal, 2017). Onyebukwa (2011) also found results that corroborate Phetla and Skaal's finding that the prevalence of obesity in HCW in one of the health centers in Mafikeng was 29.7% and the prevalence of overweight was about 41%. Community Health Workers who worked in one of the black townships in Cape Town associated being big with dignity and being respected (Puoane *et al.*, 2005). The challenges that face HCWs in South Africa are not different from those of the general community. Several studies that have been conducted showed that HCWs are exposed to socio-cultural and environmental risk factors which are similar to those that the general population of South Africa face (Phetla and Skaal, 2017; Simfukwe, Wyk and Swart, 2017).

2.3 Community health workers as vital sources of information

Since the 1950s community health workers (CHWs) have been deployed throughout the world to address the cost and scarcity of medical staff; complement existing primary health care; and improve the quality and health outreach (Kruger, 2006; Brownstein *et al.*, 2007; Friedman *et al.*, 2007; American Public Health Association, 2009; Bangdiwala *et al.*, 2010; van Ginneken, Lewin and Berridge, 2010). Community health workers serve as liaisons between health services and the community and can perform a range of activities including facilitating access to services, improving the cultural competence of service delivery, and providing community education, social support, and advocacy (Tsolekile *et al.*, 2014; Egbujie *et al.*, 2018). Because CHW's are

less expensive, very familiar with local resources, norms, language, and culture, they are potentially more effective than some clinic staff (Kruger, 2006). Most research that has been conducted in South Africa to estimate the prevalence and factors that expose HCWs to obesity have focused in HCWs that are working within the primary healthcare centers and literature shows that there is a gap in knowledge of obesity risk factors and prevalence among this group.

2.4 Food and nutrition literacy

Food and nutrition literacy is defined as: i) the combination of access to nutritious food; ii) the analysis and evaluation of the information related to food and nutrition; iii) making and implementing good decisions about food; iv) maintaining healthy eating; v) choosing and consuming proper amounts of healthy food and motivations; vi) knowledge, skills, attitudes, behaviors; as well as vii) abilities that are required to ensure food security (Murimi, 2013; Aktaş and Özdoğan, 2016). To corroborate this definition, Vidgen and Gallegos (2013) suggest that food literacy is more than just nutrition knowledge, but to include the selection of the right food, and acquiring knowledge and skills in the areas of meal planning, preparation, and eating itself. Food and nutrition knowledge and literacy are essential factors as they enable people to identify which foods are healthy to procure and consume (Worsley, 2002; Cleland, 2013). People who reside in townships and informal settlements in other countries were found to have low levels of food and nutrition (Lam and Yang, 2014). Studies that were conducted in South African black women showed that women who reside in townships and informal settlements tend to have low nutrition knowledge (Peltzer, 2004; Smit *et al.*, 2017). According to Lam and Yang (2014) there seems to be a negative relationship between people's nutrition literacy and obesity.

2.4.1 Food and nutrition literacy components

2.4.1.1 Food knowledge

The South African studies which have looked into the nutrition knowledge of different research groups, such as consumers most often present nutrition knowledge in the form of knowledge concepts and processes related to nutrition; the knowledge of nutrients; and the relationship of knowledge with diet; health, and disease (Axelson and Brinberg, 1992; Moorman, 1996; McKinnon, Giskes and Turrell, 2014). Two recent studies on the nutrition knowledge of street food vendors and consumers point towards a lack of nutrition knowledge regarding a healthful diet (Hill *et al.*, 2016, 2019). According to Hill *et al.* (2019, p. 9), less than 50% of street food vendors were able to answer nutrition-related questions on starches and fats correctly, while only

one in three could answer the question on sweetened beverages. Food knowledge is an important component of food literacy as it forms as a basis of food choices. In fact, studies have found that food and nutrition knowledge is significantly associated with healthy eating (Wardle, Parmenter and Waller, 2000; Noronha *et al.*, 2020). However, a study conducted by Peltzer *et al.* (2004) showed that in South Africa, black people, especially black women have significantly lower nutrition knowledge when compared to their white counterparts. Furthermore, very concerning results were seen in a study conducted among nursing students by Van den Berg *et al.* (2012), where it was found that only less than 50% participants knew what the recommended intake of vegetable, fruit, and dairy was (Van Den Berg *et al.*, 2012). For this reason, it is of importance to test CHWs nutrition knowledge as they serve as sources of information to the broader community.

2.4.1.2 Meal Planning

Meal planning is a process that includes scheduling meals that will be prepared and consumed in the next day, or in the following week or weeks (The Nutrition Source, 2017). Meal planning is designed to help encourage people who have time constraints to prepare their meals at home, in advance and most importantly to help improve the quality of peoples' diet (Ducrot *et al.*, 2017). According to Ducrot *et al.* (2017, p. 2) meal planning has largely been used for people with special nutrition needs. These include patients with chronic diseases. As important as meal planning may be in improving diet and health, globally and in South Africa there is currently limited to no literature available on this subject.

2.4.1.3 Food selection

Unhealthy eating patterns in South Africa are not only due to cultural factors; the lack of skills and attitudes towards food selection also contributes to that. Most people in South Africa, especially the elderly from poor communities are uneducated making it difficult for them to make good food choices. Social context and social setting also play a part in what kind of foods people select (EUFIC, 2006). Some people choose to consume fast food because they want to prove their wealth to the society (Kroll, 2016). Above this, there are also social gatherings where food is prepared for everyone and people (guests) are unable to choose the type of foods cooked or served (Puoane *et al.*, 2006).

Several factors such as affordability, accessibility, and acceptability of the food within certain communities' influence food selection among South Africans (Puoane *et al.*, 2006; Temple and

Steyn, 2009; Micklesfield *et al.*, 2013). There is also evidence that suggests people's assumption that healthy food options are expensive when compared to less healthy food options (Temple and Steyn, 2009). Hence, people who grapple with financial constraints tend to opt for less healthy food options (Radder and le Roux, 2005). Evidence shows that, people from low-income households do not have the leisure of a variety of food options, and this exposes/predisposes them to health conditions such as obesity and undernutrition (Shisana *et al.*, 2013).

In most instances, township residents rely on in spaza shops for purchasing convenient daily food items (Brown, Bacq and Charman, 2018). However, a study conducted in the Western Cape township by Roos *et al.* (2013) found that the spaza shops often stocked sweetened products and processed food and a limited variety of vegetables and fruits..

Other factors that have been found to influence the food selection are taste, food appearance and the smell of food (Funke *et al.*, 2007). Food palatability contributes to the food choices of most people. Most people like to enjoy tasty food that smells good, and it is no secret that most foods with sensory appeal are those with high fat and sugar (EUFIC, 2006).

2.4.1.4 Food preparation and cooking methods

Nutrient control in most communities is mediated by food preparation, such that less healthy additives are used during cooking and preparation (Mchiza, Hill and Steyn, 2014). For instance, street food vendors add excessive amounts of salt, sugar, and fat during food preparation to enhance its palatability (Mchiza, Hill and Steyn, 2014). In fact, South African evidence suggested that township dwellers in the Western and Eastern Cape prefer to fry their food instead of boiling, since they regard this cooking method to be easy, tasty, appealing and fast (Chopra and Puoane, 2003). This therefore puts individuals who consume food cooked in this manner at a greater risk of developing NCDs.

2.4.1.5 Eating behaviors

The South African diet has transitioned along the years from a traditional based meal including legumes, whole grain foods and traditional vegetables to westernized meals rich in fats, oils, and animal-based products high in saturated fats (Mbogori and Mucherah, 2019). Some of the factors that have contributed immensely in diet transition are urbanization, industrialization and

economic developments (Satterthwaite, McGranahan and Tacoli, 2010; Holmboe-Ottesen and Wandel, 2012). Most people have migrated from rural areas to reside in urban areas to search for job opportunities (Ajaero and Onokala, 2013). This has exposed most urban dwellers to high fat food products through high availability and access to fast food outlets or informal food vendors that sell poor quality cheap fast foods which then leads to overweight and obesity (Micklesfield *et al.*, 2013). Accessibility to fast foods becomes easier as people get jobs and have less time to prepare meals. Studies conducted by Okop *et al.* (2016), and Mchiza *et al.* (2013) evidently found that social norms and expectations that women should be big as well as unhealthy food advertisement through mass media are other socio-environmental factors that has the capacity to drive peoples' eating behaviors in South Africa.

Individual factors as drivers of eating behaviors cannot be ignored. Puoane *et al.* (2006) conducted a study on factors influencing food consumption in the black African population and in this study, it was found that people liked to indulge in fatty meat and sweetened foods. These results seemed to be true in other continents as well as studies in American and European countries which have also found similar results, showing that taste and food appearance are important determinants of eating behaviors (Murimi *et al.*, 2016)

Emerging evidence shows that South African health care professionals have also been found to have risky health behaviors. Kunene *et al.* (Kunene and Taukobong, 2017) conducted a cross sectional study that looked at the dietary habits among health professionals in a district hospital. Their results showed that the majority of health care professionals consumed a lot of unhealthy foods and sweetened beverages. Monakali *et al.* (2018) also conducted a study on health promoting lifestyle behavior among nurses and in this study, it was found that about 33% nurses did not engage in physical activities and only 29% of those who did physical activities met the WHO recommendation of being active. However, most of the studies among health care workers have been conducted among professionals and not in community health workers, hence it is important to conduct this study to add to the body of knowledge of the community health workers.

2.4.1.6 Use of Food labels

Food is the most important basic resource that all people require to live. However, according to the nutritional experts and evidence that has been published by health organizations, health and

public health experts in most studies, not all food products are good (Hasler, 2002; Fuhrman, 2018; André, Chandon and Haws, 2019). They argue that some food products contain excessive salt, saturated and trans-fat which are known to contribute to overweight and obesity and other cardiovascular conditions (Anand *et al.*, 2016; Briggs, Petersen and Kris-Etherton, 2017). To try and make it easy for consumers to make informed food choices, nutritional food labeling became mandatory for all foodstuff in South Africa (Department of Health, 2010). South African regulations relating to labelling and advertising of foodstuffs (R146) defines food label as “any tag, brand, mark, pictorial, graphic or other descriptive matter, which is written, printed, stenciled, marked, embossed, impressed upon, or permanently attached to a container of a foodstuff, and includes labelling for the purpose of promoting its sale or disposal”(Koen, Blaauw and Wentzel-Viljoen, 2016).

Since the implementation of the food labelling policy in South Africa, there are several studies that have looked at the use, and the understanding of food labels within South African context. A cross sectional study conducted by Koen *et al.* (2018) showed that consumers in Cape Town had fair food and nutrition label knowledge but did not read nutrition information regularly. In this study it was also found that 33% of consumers were not interested in reading the food labels. But rather in the sell by dates and on food products that were on specials.

Most international studies have shown a positive association between food labelling and improved diet (Soederberg Miller *et al.*, 2015; Ni Mhurchu *et al.*, 2018). An example of these studies is a study that was conducted by Mhurchu *et al.* (Ni Mhurchu *et al.*, 2018) that showed a significant association between label use and the healthiness of products purchased.

Community health workers are representatives of the communities, especially disadvantaged communities and it is important to know their frequency of using food labels, with the assumption being that if they understand the importance of making use of food labels they would be more likely to transfer this information to their communities at large.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The following areas are addressed in this chapter: study design, population and sampling, sampling size, data collection plan, statistical analysis, validity and reliability, ethical consideration and study limitations.

3.2 Study design

This study was a quantitative, descriptive cross-sectional study. Cross sectional studies are generally used to gather data on behavior or the attitudes at a single point in time (Sedgwick, 2014). The data included in the current study was collected at one point in time. This study used a cross sectional study design because when compared to other types of designs it was generally cheaper and quicker to undertake. The data collected is advantageous in that the results that are generated through this research would help in public health planning. Furthermore, the current study was a descriptive cross sectional study, with its main aim being to describe outcomes such as the BMI and food knowledge using a group of associated factors (i.e. meal planning, food preparation, food consumption, and the use of food labels) within a specified population (i.e. CHWs) (Schulz and Grimes, 2002).

3.3 Population and Sampling

In this study purposive sampling procedure was used as it deliberately select the population based on the certain characteristics that were best suited to answer the proposed research questions (Tongco, 2007). The type of purposive sampling that was used is the total population sampling or inclusive sampling since there was quite a small population of CHWs available for inclusion in the study (Wu Suen, Huang and Lee, 2014). In this case, this study included females only, since 99% of the CHWs in the proposed townships were females. There was also a small number of CHWs in the proposed sites, hence all female CHWs were included in the current study. The purpose of using the total population sampling was to increase the chances of the study being generalizable to a similar population and to reduce the chances of having less conclusive results (Faber and Fonseca, 2014). As such, all the female CHWs from three sites of the NPO were invited to take part in this study.

The eligible study population were all female CHWs that were 25 years and older who were hired by St John Non-Profit Organization to conduct health promotion services in Nyanga,

Gugulethu or Kensington communities. Community health workers that were younger than the age of 18 years and those in supervisory positions were excluded because they had a different scope of work from that of ordinary CHWs and they had little to no encounter with the public communities. Male CHWs were also excluded since this gender comprised of less than 1% of the CHW community. Moreover, males were excluded since this study aimed to target the group that is at the highest risk of obesity, namely, women who reside in poorer townships.

3.4 Sample size

During this study, 106 CHWs were employed to do health promotion by St John in all the three Cape Metropole townships. Out of the 106, there were 7 male CHWs and 3 CHWs on the supervisory roles. This meant that the overall sample size for this study was 96. All the 96 CHWs consented to take part in the current study. However, the study analyzed data from 95 CHWs with one CHW's questionnaire excluded from analysis due to incomplete data.

3.5 Data collection

3.5.1 Paper Based data collection plan

Data was collected using previously validated questionnaires for food and nutrition literacy (Kouboukika, Mchiza and Buldeo, *unpublished data*). The questionnaires comprised different sections, which were socio-demographic characteristics; food knowledge, meal planning, meal preparation, eating behaviors, and use of food labels, which were adapted from the previously validated international Questionnaires (Vorster, Badham and Venter, 2013; Vidgen and Gallegos,(2013). The data collection tool for this research was a structured questionnaire, which is used in quantitative researches. This meant that a person who collected data followed and asked a set of questions as they were outlined in the questionnaire. This person who was administering the questionnaire had to select an option from a list of given options. The investigator administered the questionnaire with assistance from a trained and experienced research assistant. The interviews were conducted in either isiXhosa, English or Afrikaans, based on the preference of the CHWs.

3.5.2 Anthropometric measurements

Body weight and height were measured by the primary investigator using calibrated weighing scales and stadiometers, after the interview with participants in a private corner. The participants were requested to remove extra clothing and shoes during weight and height measurements. Body mass index of each participant was calculated using the weight and height measurements.

Underweight, normal weight, overweight and obesity were indicated by the BMI levels that were <18.5, =18.5-24.9, =25-29.9 and $\pm 30 \text{ kg/m}^2$ respectively (CDC, 24/7).

3.6 Statistical Analyses

Data was captured into Microsoft Excel, cleaned and then imported to SPSS version 25 and the SIMCA (version 15, Sartorius Stadium Biotech, Germany for Multivariate Data Analysis [MVDA]) for statistical analyses.

Data analysis using SPSS:

Descriptive statistics (frequency, percentages, cross tabulation) were used to analyze, sociodemographic characteristics, BMI, food knowledge, meal planning, meal preparation, eating behaviors, and the use of food labels. Chi squared tests were used to show percentage differences against specific groups. Moreover, the correlation coefficients between sociodemographic characteristics, BMI, food knowledge and nutrition literacy components were calculated using the Spearman's correlation since ranked variables were used. This was done to see whether the variables covaried (meaning that, to see whether when one variable increased, the other variable tended to increase or decrease). In this case, significance was determined using p-values that were <0.05.

Table 1: Data analysis using SPSS

Objective	Analysis
1 To determine the BMI of community CHWs	Descriptive statistics: - Mean BMI values and standard deviations, minimum and maximum values. Prevalence or frequencies of: - Underweight, normal weight and obesity
2 To determine the level of food knowledge among CHWs	1. Categorized food knowledge to: - Low or no food knowledge (scores within 0 and 5) - Average food knowledge (scores within 6 and 9) - Acceptable food knowledge (scores within 10 and 15). 2. Descriptive statistics: - Percentages of food knowledge (to indicate the proportion of participants with different levels of food knowledge).

3 To determine nutrition related behaviors for maintaining healthy BMI (also known as nutrition literacy; presented as meal planning, food preparation, food consumption, and the use of food labels) among CHWs

1. Categorized meal planning to:

- Low level or no planning of meals (using scores within 0 and 1)
- Acceptable level of meal planning (using scores within 2 and 3).

2. Categorized food preparation to:

- Less than acceptable level of food and meal preparation (using scores within 0 and 1)
- Acceptable level of food and meal preparation (using scores of 2)

3. Grouped eating behaviour outcomes to:

- Risky eating (using scores within 0 and 5)
- Favourable eating behaviour (using scores within 6 and 9).

Percentages/Frequencies of:

- Meal planning and food preparation
- Eating behaviours
- Use of food labels
- Understanding of food labels

4 To determine the association between the BMI, food knowledge and food and nutrition literacy

1. Cross tabulations between BMI and:

- Sociodemographic characteristics
- Food knowledge
- Nutrition literacy (i.e. meal planning, food preparation, eating behaviors and the use of food labels)

2. Cross tabulations between sociodemographic variable and:

- Food knowledge
- Nutrition literacy (i.e. meal planning, food preparation, eating behaviors and the use of food labels)

[For crosstabs Chi-square test and p-values (significant p-values was set at <0.05) was used]

Data analyses using the SIMCA software

SIMCA was used to perform multivariate data analysis. In this case, the PCA was used to describe and make sense of the spread of data. Then the OPLS was used to understand which of the variables were associated with BMI and food knowledge. Moreover, the BMI, food knowledge and nutrition literacy outcomes were plotted to show the overall percentage of variation that was explained (as shown by RX^2) or predicted (as shown by QX^2) by the models. In this case, significance was determined using confidence intervals that did not overlap or those that did not include zero.

3.7 Validity and Reliability

To regard a data collection tool as valid, it should effectively measure the knowledge that it is intended to measure (Kimberlin and Winterstein, 2008). For this reason, all the instruments that were used to collect data in this study had been previously validated and used successfully in other studies (Kouboukika, Mchiza and Buldeo, *unpublished data*). To measure the validity of the data collection instruments in this research, the experts who were the supervisors of the primary investigator, who were based at the University of the Western Cape and at the University of Antwerp, were asked to review the questions to see whether the questionnaire tests what it was meant to test. This type of validity is called face validity (Connell *et al.*, 2018). In addition, the questionnaire was pretested among a similar but smaller group of CHWs (i.e. 10 participants) that work a similar setting (Khayelitsha township) that was not included in the study. The variables that were measured in the study were simple and unambiguous.

To improve the reliability of the questionnaire, the investigator only allowed the CHWs to answer questions by selecting their choices from the provided options only (Kimberlin and Winterstein, 2008). The questionnaires were checked for quality control at the end of every data collection session to determine if the data was collected as it should have been. The data collection tool was translated to the local languages (isiXhosa Questionnaire and Afrikaans Questionnaire) that the CHWs understand.

3.8 Generalizability

Generalizability is an ability to use results that are generated in a study to other settings (Polit and Beck, 2010). Results that were generated through this research can only be generalizable to the CHWs that operate in the three study sites (Gugulethu, Nyanga and Kensington) of the organization in which the research is conducted. However, these results cannot be generalizable to the whole population of CHWs in other Cape Town townships, as the sample that was used

in the study was not representative of the general population of CHWs.

3.9 Ethics Consideration

Ethical approval was sought from the University of the Western Cape Biomedical Research Ethics Committee before the commencement of data collection: Ref: BM19/8/17 ([Mini-thesis UWC Ethics Approval](#)). A letter to ask for permission to conduct the study with CHWs within the organisation was sent to the manager of the St John Non-Profit Organization ([St John Letter of Support](#)). All participants were informed of what the study entails and what was expected of them during this study. Information sheets ([Xhosa Information Sheet and Afrikaans Information Sheet](#)) written in their indigenous language with all the study details and contact information of people to consult in case they had queries was read and given to them before they were enrolled in the study. The information included informing the CHWs that their participation was voluntary. They were also told that, should they agree to take part in the study, their information was to be kept confidential by using identification codes instead of their true identification details. Minimal risks in taking part in the study ensured by the researcher in that appropriate measures (that include referral to a qualified professional) were to be taken, should any of the participants' experience physical and or psychosocial distress due to their participation in the study. After that, all CHWs who were willing to take part in the study gave written consent ([Consent forms](#)). Participants were told that, taking their measurements such as weights and heights would not be invasive or cause any discomfort, and should they want their personal information (such as the BMI that was calculated out of these measurements) it would be made available to them. They were assured that all their information would be kept confidential and would not be shared with third parties. Names of the CHWs were also not captured on questionnaires or when measurements were being collected, as study numbers were assigned to all the data collected from the participants. The consent forms were kept separate to the questionnaires and data on BMI. To ensure confidentiality all collected paper-based information and data was kept in lockable cabinets in the office of the supervisor and only the supervisor and the primary investigator had access to these files. The electronic data was password protected and stored on the researchers' computer. Only the supervisor and the primary investigator had access to this password. Participants were informed that the data generated from this research was to be kept for five years as this project forms part of a larger project which is aimed at developing, adjusting and validating a multi-media (MM) education-entertainment (EE) program to improve food and nutrition literacy, as well as body image of South African women who are residents in the Gugulethu, Nyanga and Kensington townships. This larger project

received ethics from the University of the Western Cape (UWC) Biomedical Research Ethics Committee (BMREC) on the 14th of January 2019 (Ethics Reference Number: BM18/9/17). After five years, paper-based data will be shredded, and all electronic data will be deleted.



CHAPTER 4: RESULTS

4.1 Introduction

This chapter focuses on the outcomes obtained from the research. As such, responses regarding the sociodemographic characteristics, food knowledge, nutrition literacy and behaviours (i.e meal planning, food preparation, eating behaviours, use and understanding of food labels) as well as the BMI of the participants are presented here. Furthermore, the outcomes related to the associations or relationships between variables are presented in this chapter.

4.2 Sociodemographic characteristics of the population

A total of 95 female CHWs had successfully completed the survey and they had valid BMI measurements. Table 2 shows that, 81.1% (n=77) were Black South Africans and 18.9% were of Mixed Ancestry (n=18). The majority (60%) were within 35 to 54 years of age, with about 25% older than 54 years of age. With regards to marital status 43.2%, 40.0%, 9.5%, 4.2% and 3.2% were single, married, widowed, cohabiting and divorced, respectively. All CHWs had some form of education, the majority (88.4%) having achieved high school education, but only 4.3% achieving tertiary education. The economic status of CHWs was assessed using the household asset index score (defined as the total number of assets a CHWs household has out of seven assets including television, fridge, stove, microwave, radio, computer, and electricity). Based on the asset index score outcomes, 91.6% CHWs had relatively good level of economic status. This was defined as a total number of assets in working condition that ranged from five to seven.

Table 2: Socio-demographic characteristics of the community health workers

	N	%
<i>Race</i>		
<i>African</i>	77	81.1
<i>Mixed Ancestry</i>	18	18.9
<i>Age</i>		
<i>25-34 years</i>	14	14.7
<i>35-44 years</i>	34	35.8
<i>45-54 years</i>	23	24.2
<i>55-64 years</i>	18	18.9
<i>65-74 years</i>	6	6.3
<i>Marital Status</i>		
<i>Single</i>	41	43.2
<i>Married</i>	38	40
<i>Living with a partner</i>	4	4.2
<i>Divorced</i>	3	3.2
<i>Widowed</i>	9	9.5

<i>Education Level</i>		
<i>Primary School</i>	7	7.4
<i>High School</i>	84	88.4
<i>Diploma</i>	3	3.2
<i>Postgraduate</i>	1	1.1
		<i>Household Asset Index Score</i>
<i>0-4 assets</i>	8	8.4
<i>5-7 assets</i>	87	91.6

4.3 Body Mass Index

4.3.1 Body mass index of the community health workers

The first objective of this study was to determine the BMI of the CHWs. Overall, the CHWs had a mean BMI of $34.7 \text{ kg/m}^2 \pm 8.2 \text{ kg/m}^2$ with minimum BMI of 17.8 kg/m^2 and maximum BMI of 57.5 kg/m^2 (data not shown).

Of 95 CHWs, 70.5%, 18.9%, 9.5% and 1.1% were obese, overweight, normal weight and underweight respectively (**Figure 1**). These results show that majority of CHWs (almost 90%) were either overweight (BMI = $25\text{-}29.9 \text{ kg/m}^2$) or obese (BMI $\geq 30 \text{ kg/m}^2$). There were about 9.5% of the CHWs that were within the normal range of weight (BMI = $18.5\text{-}24.9 \text{ kg/m}^2$), and only 1.1% of CHWs were underweight (BMI of $< 18.5 \text{ kg/m}^2$).

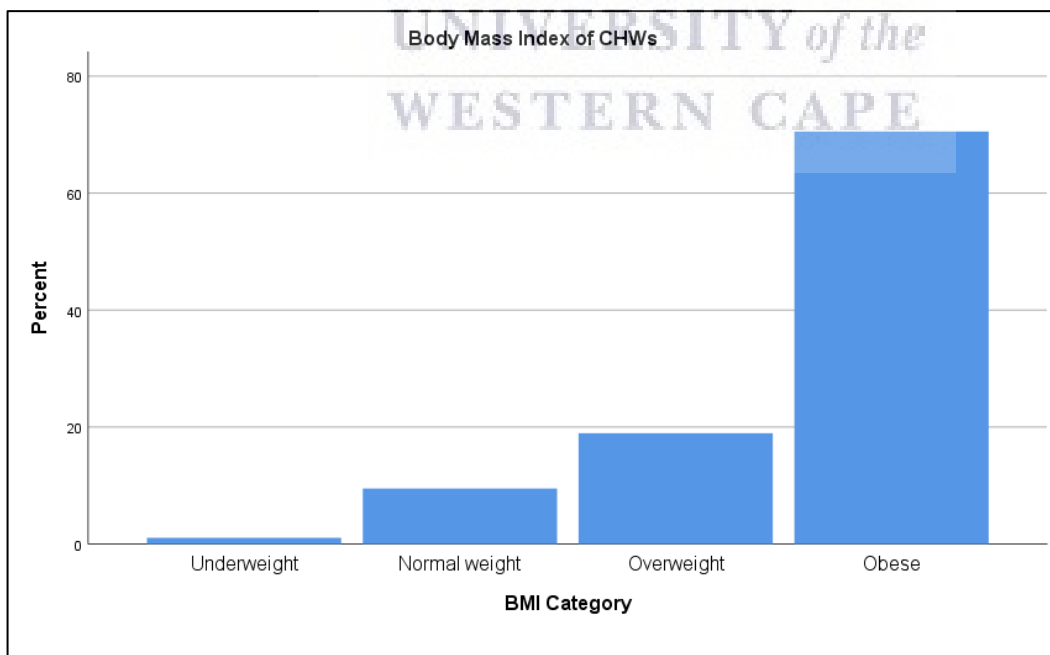


Figure 1: Body mass index of the community health workers

4.3.2 The proportion of underweight, healthy weight, overweight and obesity among CHW by socio-demographic characteristics

The BMI outcomes were compared to sociodemographic characteristics of the CHWs using the Chi square test. Outcomes are shown in **Table 3** below. No significant differences were observed between BMI and most of the sociodemographic characteristics (i.e. race, age and education) with an exception of the asset index score. This suggested that, the majority of the CHWs (70.1% and 19.5%) with acceptable asset index scores (i.e. had scores of total household items that were within 5 to 7) were overweight and obese. In this case, a significant difference was found between BMI and household assets ($\chi^2=11.92^a$, $df = 3$, $p=0.008$).

Table 3: The proportion of underweight, healthy weight, overweight and obese community health workers by socio-demographic characteristics

	Underweight	Normal weight	Overweight	Obese	Results on association
	N (%)				χ^2 & p-value
Demographics characteristics					
Race					
African	0 (0.0)	7 (9.1)	15 (19.5)	55 (71.4)	$\chi^2 = 4.45$
Mixed-Ancestry	1 (5.6)	2 (11.1)	3 (16.7)	12 (66.7)	$p = 0.22$
Age					
25-34 years	0 (0.0)	1 (7.1)	4 (28.6)	9 (64.3)	$\chi^2 = 6.75^a$
35-44 years	1 (2.9)	3 (8.8)	8 (23.5)	22 (64.7)	$p = 0.87$
45-54 years	0 (0.0)	2 (8.7)	2 (8.7)	19 (82.6)	
55-64 years	0 (0.0)	3 (16.7)	3 (16.7)	12 (66.7)	
65-74 years	0 (0.0)	0 (0.0)	1 (16.7)	5 (83.3)	
Marital Status					
Single	0 (0.0)	5 (12.2)	10 (24.4)	26 (63.4)	$\chi^2 = 9.68^a$
Married	1 (2.6)	1 (2.6)	7 (18.4)	29 (76.3)	$p = 0.64$
Living with a partner	0 (0.0)	1 (25.0)	0 (0.0)	3 (75.0)	
Divorced	0 (0.0)	0 (0.0)	0 (0.0)	3 (100)	
Widowed	0 (0.0)	2 (22.2)	1 (11.1)	6 (66.7)	
Education Level					
Primary School	0 (0.0)	0 (0.0)	1 (14.3)	6 (85.7)	$\chi^2 = 6.76^a$
High School	1 (1.2)	9 (10.7)	16 (19.0)	58 (69.0)	$p = 0.66$
Diploma	0 (0.0)	0 (0.0)	0 (0.0)	3 (100)	

<i>Postgraduate</i>	0 (0.0)	0 (0.0)	1 (100)	0 (0.0)	
<i>Household Asset Index Score</i>					
<i>0-4 assets</i>	1 (12.5)	0 (0.0)	1 (12.5)	6 (75.0)	$\chi^2 = 11.92^a$
<i>5-7 assets</i>	0 (0.0)	9 (10.3)	17 (19.5)	61(70.1)	*p= 0.008

Note *p-value <0.05

4.4 Food Knowledge

The second objective for this study was to determine the level of food knowledge among CHWs.

4.4.1 The food knowledge construct

This construct comprised of a total of 15 questions that elicited information regarding food knowledge. A total score that fell within zero and 5 indicated limited or no food knowledge, a total score that fell within 6 and 9 indicated average food knowledge, and a total score that fell within 10 and 15 indicated acceptable food knowledge. An equal spread of CHWs obtained average (44.2%) and acceptable (47.4%) food knowledge (**Table 4**). However, even though they were few, there were still CHWs (8.4%) that had limited food knowledge.

Table 4: Distribution of food knowledge among CHWs

<i>Level of Food Knowledge</i>	<i>N</i>	<i>Percent (%)</i>
<i>Limited</i>	8	8.4
<i>Average</i>	42	44.2
<i>Acceptable</i>	45	47.4

4.4.1.1 The distribution of food knowledge by socio-demographic characteristics

Approximately 48% and 41% of Black CHWs had average and acceptable food knowledge, respectively (**Table 5**). About 11% had limited food knowledge. The majority (72.2%) of Mixed Ancestry CHWs had acceptable food knowledge and about 27% had average food knowledge. None of the Mixed Ancestry CHWs had scores within 0 and 5. A significant difference was observed between the level of food knowledge and race ($\chi^2=6.123^a$, df=2, p=0.047). Community health workers that were between the ages of 65 and 74 years had the acceptable food knowledge compared to CHWs within other age groups. This difference was however not significant ($\chi^2=5.05^a$, df=8, p=0.75). Moreover, no significant relationships were observed between food knowledge and other sociodemographic characteristics (i.e. marital status, education level and

household asset index). It is however important to note that in this sample, 11.1% widowed CHWs presented with limited food knowledge, while 75% CHWs with 0-4 household assets had acceptable food knowledge.

Table 5: The distribution of food knowledge by sociodemographic characteristics

	<i>Low food knowledge</i>	<i>Average food knowledge</i>	<i>Acceptable food knowledge</i>	<i>Results on association</i>
	<i>N (%)</i>			<i>χ² & p-value</i>
Race				
<i>African</i>	8 (10.4)	37 (48.1)	32 (41.6)	<i>χ² = 6.123a</i> *p= 0.047
<i>Mixed-Ancestry</i>	0 (0.0)	5 (27.8)	13 (72.2)	
Age				
<i>25-34 years</i>	1 (7.1)	7 (50.0)	6 (42.9)	<i>χ² = 5.05a</i> <i>p = 0.75</i>
<i>35-44 years</i>	4 (11.8)	15 (44.1)	15 (44.1)	
<i>45-54 years</i>	1 (4.3)	12 (52.2)	10 (43.5)	
<i>55-64 years</i>	2 (11.1)	7 (38.9)	9 (50.0)	
<i>65-74 years</i>	0 (0.0)	1 (16.7)	5 (83.3)	
Marital Status				
<i>Single</i>	4 (9.8)	22 (53.7)	15 (36.6)	<i>χ² = 5.68a</i> <i>p=0.68</i>
<i>Married</i>	3 (7.9)	16 (42.1)	19 (50.0)	
<i>Living with a partner</i>	0 (0.0)	1 (25.0)	3 (75.0)	
<i>Divorced</i>	0 (0.0)	1 (33.3)	2 (66.7)	
<i>Widowed</i>	1 (11.1)	2 (22.2)	6 (66.7)	
Education Level				
<i>Primary School</i>	0 (0.0)	3 (42.9)	4 (57.1)	<i>χ² = 2.635</i> <i>p = 0.85</i>
<i>High School</i>	8 (9.5)	38 (45.2)	38 (45.2)	
<i>Diploma</i>	0 (0.0)	1 (33.3)	2 (66.7)	
<i>Postgraduate</i>	0 (0.0)	0 (0.0)	1 (100)	
Household Asset Index				
<i>0-4 assets</i>	0 (0.0)	2 (25.0)	6 (75.0)	<i>χ² = 2.87a</i> <i>p = 0.24</i>
<i>5-7 assets</i>	8 (9.2)	40 (46.0)	39 (44.8)	

Note * represents p-value <0.05*

4.4.1.2 The distribution of food knowledge by body size

Table 6 shows that the distribution of food knowledge by BMI only tended to significance ($\chi^2=12.423^a$, $df=6$, $p=0.53$). About 73.8% CHWs who had average food knowledge were obese and similarly 71.1% CHWs who had acceptable level of food knowledge were obese.

Table 6: The distribution of food knowledge by body size

	<i>Underweight</i>	<i>Normal weight</i>	<i>Overweight</i>	<i>Obese</i>	<i>Results on association</i>
	N (%)				χ^2, p-value
<i>Limited food knowledge</i>	0 (0.0)	3 (37.5)	1 (12.5)	4 (50.0)	$\chi^2=12.423^a$ $p=0.053$
<i>Average food knowledge</i>	0 (0.0)	5 (11.9)	6 (14.3)	31 (73.8)	
<i>Acceptable food knowledge</i>	1 (2.2)	1 (2.2)	11 (24.4)	32 (71.1)	

4.5 Nutrition Literacy

The third objective for this study was to determine the level of nutrition literacy among CHWs. To answer this objective, data was collected and analyzed separately under four different themes or constructs (i.e. meal planning, food preparation, eating behavior and the use of food labels). The results are presented as below.

4.5.1 Meal planning and food preparation

Results presented in **Tables 7 and 8** show meal planning and food preparation by CHWs. This included three questions that are key in meal planning, and two questions that are key to food preparation that were asked to all CHWs.

4.5.1.1 Frequency of meal planning and food preparation

In terms of meal planning, the majority (41.1% and 22.1%) of the CHWs reported that they shopped for grocery often and very often, respectively (**Table 7**). Moreover, the majority (26.3% and 28.4%) of CHWs on the other hand reported that they made grocery shopping lists often and

very often, respectively. Finally, close to one-third (30.5%) of the CHWs reported that they prepared meals ahead of time often, while 23.2% prepared meals ahead of time very often.

In terms of food preparation, **Table 7** shows that the majority (67.3%) of CHWs cooked food often and very often, while 25.3% reported that they cooked occasionally. More than 40% of the participants reported that they sometimes prepared meals using of leftover food, with only 25.2% CHWs suggesting that they prepared meals out of leftover food often and very often.

Table 7: Frequency of meal planning and food preparation among CHWs

<i>How often do you do the following?</i>	<i>Never</i>	<i>Almost Never</i>	<i>Sometimes</i>	<i>Often</i>	<i>Very Often</i>
	N (%)				
Meal Planning					
1. <i>Grocery shopping</i>	1 (1.1)	19 (20.0)	15 (15.8)	39 (41.1)	21 (22.1)
2. <i>Make a grocery shopping list</i>	3 (3.2)	18 (18.9)	22 (23.2)	25 (26.3)	27 (28.4)
3. <i>Prepare meals ahead of time</i>	4 (4.2)	14 (14.7)	26 (27.4)	29 (30.5)	22 (23.2)
Food Preparation					
1. <i>Cook</i>	2 (2.1)	5 (5.3)	24 (25.3)	29 (30.5)	36 (36.8)
2. <i>Create meals out of leftovers</i>	16 (16.8)	14 (14.7)	41 (43.2)	14 (14.7)	10 (10.5)

4.5.1.2 Levels of meal planning

The total score for meal planning was calculated and categorized as either low level or no meal planning (score of 1 or less), or acceptable level of meal planning (scores of 2 to 4). Participants were given a score for each correct response. Majority (70.5) of CHWs had acceptable levels of meal planning and only 29.5% had low levels of meal planning (**Table 8**).

Table 8: Levels of meal planning among CHWs

<i>Levels of meal planning</i>	<i>N</i>	<i>Percent (%)</i>
<i>Low level of meal planning</i>	28	29.5
<i>Acceptable level of meal planning</i>	67	70.5

4.5.1.3 The distribution of meal planning by sociodemographic characteristics

A Chi square test was conducted to ascertain the distribution of meal planning by sociodemographic characteristics (Table 9). There were no significant differences observed between meal planning and sociodemographic characteristics. However, 77.8% Mixed Ancestry CHWs had acceptable level of meal planning while more than thirty percent (31.2%) African CHWs had low level of meal planning. The majority of CHWs in all aged groups had acceptable levels of meal planning. Majority of the CHWs had high school education with 71.4% of these scoring acceptable on meal planning. The majority of the CHWs were also single and married with 68.3% and 71.1% of them having acceptable level of meal planning. Finally, 70.5% of the CHWs who had 5 to 7 household items had acceptable meal planning levels.

Table 9: The distribution of meal planning by sociodemographic characteristics

	Low level of meal planning (scores 0 to 1)	Acceptable level of meal planning (scores 2 to 4) N (%)	Results on association χ^2 , p-value
<i>Demographics</i>			
<i>Race</i>			
African	24 (31.2)	53 (68.8)	$\chi^2 = 0.562a$
Mixed-Ancestry	4 (22.2)	14 (77.8)	p = 0.45
<i>Age</i>			
25-34 years	3 (21.4)	11 (78.6)	
35-44 years	12 (35.3)	22 (64.7)	$\chi^2 = 1.185a$
45-54 years	6 (26.1)	17 (73.9)	p = 0.88
55-64 years	5 (27.8)	13 (72.2)	
65-74 years	2 (33.3)	4 (66.7)	
<i>Marital Status</i>			
Single	13 (31.7)	28 (68.3)	
Married	11 (28.9)	27 (71.1)	
Living with a partner	1 (25.0)	3 (75.0)	$\chi^2 = 0.391a$
Divorced	1 (33.3)	2 (66.7)	p = 0.08
Widowed	2 (22.2)	7 (77.8)	
<i>Education Level</i>			
Primary School	2 (28.6)	5 (71.4)	
High School	24 (28.6)	60 (71.4)	$\chi^2 = 2.450a$

<i>Diploma</i>	2 (66.7)	1 (33.3)	p= 0.48
<i>Postgraduate</i>	0 (0.0)	1 (100)	
<i>Household Asset Index</i>			
<i>0-4 assets</i>	4 (50.0)	4 (50.0)	$\chi^2= 1.771$ a
<i>5-7 assets</i>	24 (27.6)	67 (70.5)	p= 0.18

4.5.1.4 The distribution of meal planning by the body size

Table 10 shows that a total of 75% CHWs who had low levels of meal planning were obese and about 68.7% CHW with acceptable level of meal planning were obese. However, these differences were not significant.

Table 10: The distribution of meal planning by body size

	<i>Underweight</i>	<i>Normal weight</i>	<i>Overweight</i>	<i>Obese</i>	<i>Results on association</i>
	N (%)				χ^2, p-value
<i>Low level of meal planning</i>	0 (0.0)	2 (7.1)	5 (17.9)	21 (75.0)	$\chi^2=0.783^a$ p=0.85
<i>Acceptable level of meal planning</i>	1 (1.5)	7 (10.4)	13 (19.4)	46 (68.7)	

4.5.1.5 Levels of food preparation among CHWs

Total score of food preparation was calculated and categorized as either low level of food preparation (score of 1 or less), or acceptable level of food preparation (scored of 2). Participants were given a score for each correct response. More than 50% CHWs had low levels of food preparation and approximately 46% had acceptable levels of food preparation (**Table 11**).

Table 11: Levels of food preparation among CHWs

<i>Levels of food preparation</i>	<i>N</i>	<i>Percent (%)</i>
<i>Low level of food preparation</i>	51	53.7
<i>Acceptable level of food preparation</i>	44	46.3

4.5.1.6 The distribution of food preparation by sociodemographic characteristics

Chi square tests were conducted to ascertain the relationship between food preparation and sociodemographic characteristics (**Table 12**). More than half Black CHWs had less than acceptable food preparation and about 55.6% Mixed Ancestry CHWs had acceptable levels of food preparation. Approximately, 57%, 52%, 65% and 50% CHWs in age groups 25-34, 35-44, 45-54 and 65-74 years, respectively had low levels of food preparation. In this group of n=31 and n=28 CHWs who were either single or married, respectively, 39% and 57.9% had acceptable food preparation. On the other hand, all (N=4, 100%) respondents who were living with partners scored low in levels of food preparation. Furthermore, majority (n=84 and n=87) of the CHW had high school education and 5 to 7 household assets, respectively, with 53.6% and 55.2% of them scoring low on meal planning. However, no significant associations were found between any of the food planning levels and sociodemographic characteristics.

Table 12: Relationship between food preparation and sociodemographic characteristics

	Low level of food preparation	Acceptable level of food preparation	Results on association χ^2 , p-value
	N (%)		
Demographics			
<i>Race</i>			
<i>African</i>	43 (55.8)	34 (44.2)	$\chi^2 = 0.763a$
<i>Mixed-Ancestry</i>	8 (44.4)	10 (55.6)	p= 0.38
<i>Age</i>			
<i>25-34 years</i>	8 (57.1)	6 (42.9)	
<i>35-44 years</i>	18 (52.9)	16 (47.1)	$\chi^2 = 2.923a$
<i>45-54 years</i>	15 (65.2)	8 (34.8)	p= 0.571
<i>55-64 years</i>	7 (38.9)	11 (61.1)	
<i>65-74 years</i>	3 (50.0)	3 (50.0)	
<i>Marital Status</i>			
<i>Single</i>	25 (61.0)	16 (39.0)	
<i>Married</i>	16 (42.1)	22 (57.9)	
<i>Living with a partner</i>	4 (100)	0 (0.0)	$\chi^2 = 6.889a$
<i>Divorced</i>	2 (66.7)	1 (33.3)	p= 0.14
<i>Widowed</i>	4 (44.4)	5 (55.6)	
<i>Education Level</i>			
<i>Primary School</i>	3 (42.9)	4 (57.1)	
<i>High School</i>	45 (53.6)	39 (46.4)	$\chi^2 = 1.397a$
<i>Diploma</i>	2 (66.7)	1 (33.3)	p= 0.706
<i>Postgraduate</i>	1 (100)	0 (0.0)	
<i>Household Asset Index</i>			
<i>0-4 assets</i>	3 (37.5)	5 (62.5)	$\chi^2 = 0.920 a$

5-7 assets	48 (55.2)	39 (44.8)	p= 0.34
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4.5.1.7 The distribution of food preparation by body size

Table 13 shows that there were no significant associations observed between food preparation and the CHWs' BMI. However, the majority CHWs (68.7% and 72.7%) that had both low and acceptable level of food preparation were obese. About 20.5% CHWs who had acceptable level of food preparation were overweight and 17.6 with low levels of food preparation were overweight. More normal body size CHWs (13.7%) had low levels of food preparation.

Table 13: Relationship between food preparation and BMI

	<i>Underweight</i>	<i>Normal weight</i>	<i>Overweight</i>	<i>Obese</i>	<i>Results on association</i>
	N (%)				χ^2, p-value
<i>Low level of food preparation</i>	0 (0.0)	7 (13.7)	9 (17.6)	35 (68.6)	$\chi^2=3.415^a$ p=0.33
<i>Acceptable level of food preparation</i>	1 (2.3)	2 (4.5)	9 (20.5)	32 (72.7)	

4.5.2 Eating behaviors

The majority of CHWs (41.1% and 36.8%) reported that they consumed fruit once or 2 to 5 times a week, with only 15.8% and 5.3% CHWs reporting consuming it daily or more each week, respectively (**Table 14**). Twenty percent and 47.4% of the CHWs reported that they consumed vegetables once and 2 to 5 times a week, respectively, with only a little more than a quarter (26.3%) and 4.2% reporting to consume it daily or more each week, respectively. Majority CHWs (28.4%, 16,8% and 8.4%) consumed fizzy drinks 2 to 5 times or daily or more than once a day, respectively. Majority of the CHWs (63.2%) on the other hand consumed fast foods once a month. Finally, majority of CHWs (38.9% and 35.8%) reported that they consumed whole grain and processed foods 2 to 5 times a week.

Table 14: Frequency of eating behaviors among CHWs

	<i>Never</i>	<i>Once a month</i>	<i>Once a week</i>	<i>2-5 times a week</i>	<i>Daily</i>	<i>More than once a day</i>
<i>How often do you eat:</i>	N (%)					
<i>Fresh fruits</i>	1 (1.1)	****	39 (41.1)	35 (36.8)	15 (15.8)	5 (5.3)
<i>Vegetables</i>	2 (2.1)	****	19 (20)	47 (47.4)	25 (26.3)	4 (4.2)
<i>Fizzy drinks</i>	11 (11.6)	****	33 (34.7)	27 (28.4)	16 (16.8)	8 (8.4)
<i>Fast foods</i>	0 (0)	60 (63.2)	20 (21.1)	10 (10.5)	2 (2.1)	3 (3.2)
<i>Whole grain</i>	1 (1.1)	11 (11.6)	25 (26.3)	37 (38.9)	18 (18.9)	3 (3.2)
<i>Processed meat</i>	5 (5.3)	15 (15.8)	28 (29.5)	34 (35.8)	10 (10.5)	3 (3.2)

**** Not part of the Likert scale in these questions

About 84.2% CHWs reported that they were more open to eating fruits and vegetables as a snack. However, 15.8% CHWs were not open to eating fruit and vegetables as a snack. The majority of CHWs (33.7%) reported that they had never taken their own lunch to work. Only 18% reported that they often carried lunch boxes to work. (Data not included in Table 13 above)

4.5.2.1 Eating behaviours of CHWs (Categorised)

For this analysis, 9 questions relating to eating behaviours were asked. Responses were categorised as either ‘risky eating behaviour’ or ‘favourable eating behaviour’ using the South African Food Based Dietary Guidelines (2013) as a guide. Those CHWs that scored 0-5 were categorised to have ‘risky eating behaviour’ and those that scored 6-9 were categorised as having ‘favourable eating behaviour’. More than 80% CHWs were found to have risky eating behaviours and only 17.9% had favourable eating behaviours (**Table 15**).

Table 15: Categorised eating behaviours among CHWs

<i>Eating Behaviour Category</i>	<i>N</i>	<i>Percent (%)</i>
<i>Risky eating behaviour</i>	78	82.1
<i>Favourable eating behaviour</i>	17	17.9

4.5.2.2 The distribution of eating behaviour by sociodemographic characteristics

Further analyses were conducted to determine association between eating behaviour and sociodemographic characteristics.

Despite no significant differences observed on the data presented in Table 1, Majority of the CHWs (all >50%) in all sociodemographic categories scored risky on eating behaviours (**Table 16**).

Table 16: Relationship between eating behaviour and sociodemographic characteristics

	<i>Risky eating behaviours</i> (scores 0-5)	<i>Favourable eating behaviours</i> (scored 6-9)	<i>Results on association</i>
	N (%)		χ^2, p-value
<i>Demographics</i>			
<i>Race</i>			
<i>African</i>	63 (81.8)	14 (18.2)	$\chi^2 = 0.023^a$
<i>Mixed-Ancestry</i>	15 (83.3)	3 (16.7)	p= 0.880
<i>Age</i>			
<i>25-34 years</i>	13 (92.9)	1 (7.1)	
<i>35-44 years</i>	29 (85.3)	5 (14.7)	$\chi^2 = 7.111^a$
<i>45-54 years</i>	20 (87.0)	3 (13.0)	p= 0.130
<i>55-64 years</i>	13 (72.2)	5 (27.8)	
<i>65-74 years</i>	3 (50.0)	3 (50.0)	
<i>Marital Status</i>			
<i>Single</i>	31 (75.6)	10 (24.4)	
<i>Married</i>	33 (86.8)	5 (13.2)	
<i>Living with a partner</i>	4 (100)	0 (0.0)	$\chi^2 = 3.398^a$
<i>Divorced</i>	2 (66.7)	1 (33.3)	p= 0.494
<i>Widowed</i>	8 (88.9)	1 (11.1)	
<i>Education Level</i>			
<i>Primary School</i>	5 (71.4)	2 (28.6)	
<i>High School</i>	71 (84.5)	13 (15.5)	$\chi^2 = 5.952^a$
<i>Diploma</i>	2 (66.7)	1 (33.3)	p= 0.114
<i>Postgraduate</i>	0 (0.0)	1 (100)	
<i>Household Asset Index</i>			
<i>0-4 assets</i>	6 (75.0)	2 (25.0)	$\chi^2 = 0.300^a$
<i>5-7 assets</i>	72 (82.8)	15 (17.2)	p= 0.584

4.5.2.3 The distribution of eating behaviours by body mass index

There was no significant difference observed between eating behaviours and the BMI status of the CHWs (**Table 17**). However, in this sample 70.5% and 70.7% CHWs with risky eating behaviours and favourable eating behaviours were obese. Approximately 17.9% CHWs with risky eating behaviours and 23.5% CHWs with favourable eating behaviours were overweight. Furthermore, there was 10.3% CHWs with risky eating behaviours who were normal weight.

Table 17: Relationship between eating behaviours and BMI

	Underweight	Normal weight	Overweight	Obese	Results on association
	N (%)				χ^2 , p-value
Risky eating behaviours	1 (1.3)	8 (10.3)	14 (17.9)	55 (70.5)	$\chi^2=0.729a$ p=0.866
Favourable eating behaviours	0 (0.0)	1 (5.9)	4 (23.5)	12 (70.7)	

4.5.3 Use of food labels

The figure below (**Figure 2**) shows the frequency of use of food labels by CHWs. Sixty percent of the CHWs reported that they read food labels often when purchasing food. Only 6.3% CHWs reported that they never read food labels when purchasing food. About 30.5% CHWs reported that they read food labels sometimes.

When CHWs were asked if they understood information on food labels, most (74.7%) agreed that they did understand this information with only 25.3% reporting that they did not understand it (**Figure 3**).

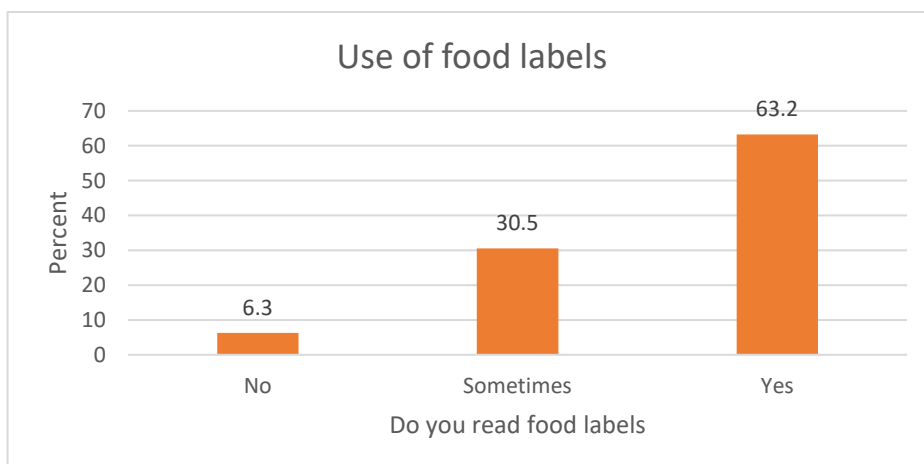


Figure 2: Frequency of the use of food labels



Figure 3: Frequency of understanding food labels

4.5.3.1 The distribution of use of food labels by sociodemographic characteristics

Table 18 shows that there were no significant differences observed for the data presented. However, it is important to note that more than 50% of the CHWs in all sociodemographic categories reported that they often used food labels to choose ideal foods when grocery shopping.

Table 18: The distribution of use of food labels by sociodemographic characteristics

	No	Sometimes	Often	Results on association χ^2 , p-val
	N (%)			
<i>Demographics</i>	UNIVERSITY of the WESTERN CAPE			
<i>Race</i>				
<i>African</i>	5 (6.5)	23 (29.9)	49 (63.6)	$\chi^2=0.092a$ p=0.955
<i>Mixed-Ancestry</i>	1 (5.6)	6 (33.3)	11 (61.1)	
<i>Age</i>				
<i>25-34 years</i>	1 (7.1)	6 (42.9)	7 (50.0)	$\chi^2=6.658a$ p=0.574
<i>35-44 years</i>	4 (11.8)	10 (29.4)	20 (58.8)	
<i>45-54 years</i>	1 (4.3)	5 (21.7)	17 (73.9)	
<i>55-64 years</i>	0 (0.0)	7 (38.9)	11 (61.1)	
<i>65-74 years</i>	0 (0.0)	1 (16.7)	5 (83.3)	
<i>Marital Status</i>				

<i>Single</i>	3 (7.3)	10 (24.4)	28 (68.3)	$\chi^2=6.417a$ p=0.601
<i>Married</i>	1 (2.6)	13 (34.2)	24 (63.2)	
<i>Living with a partner</i>	1 (25.0)	1 (25.0)	2 (50.0)	
<i>Divorced</i>	0 (0.0)	2 (66.7)	1 (33.3)	
<i>Widowed</i>	1 (6.3)	3 (33.3)	5 (55.6)	
<i>Education Level</i>				
<i>Primary School</i>	0 (0.0)	1 (14.3)	6 (85.7)	$\chi^2=4.207a$ p=0.649
<i>High School</i>	6 (7.1)	26 (31.0)	52 (61.9)	
<i>Diploma</i>	0 (0.0)	2 (66.7)	1 (33.3)	
<i>Postgraduate</i>	0 (0.0)	0 (0.0)	1 (100)	
<i>Household Asset Index</i>				
<i>0-4 assets</i>	1 (12.5)	1 (12.5)	6 (75.0)	$\chi^2= 1.653a$ p=0.438
<i>5-7 assets</i>	5 (5.7)	28 (32.2)	54 (62.1)	

4.5.3.2 The distribution of use of food labels by body size

The results presented in Table 19 show that there were no significant differences between the BMI and use of food labels by CHWs. However, 75% of those who often read food labels were obese and approximately 50% and 65% of those who did not or sometimes used food labels when grocery shopping were either overweight or obese, respectively. About 10% CHW who either used or sometimes used food labels were within the normal range of weight.

Table 19: Relationship between use of food labels and BMI

	<i>Underweight</i>	<i>Normal weight</i>	<i>Overweight</i>	<i>Obese</i>	<i>Results on association</i>
	N (%)				χ^2 , p-val
<i>No</i>	0 (0.0)	0 (0.0)	3 (50.0)	3 (50.0)	$\chi^2=7.110a$ p=0.311

<i>Sometimes</i>	1 (3.4)	3 (10.3)	6 (20.7)	19 (65.5)
<i>Often</i>	0 (0.0)	6 (10.0)	9 (15.0)	45 (75.0)

4.6 Spearman’s correlation between sociodemographic and BMI, food and nutrition components

Further analysis to elicit correlations between sociodemographic characteristics and BMI, food and nutrition literacy components was conducted using spearman’s correlation. No significant relationships were observed between the BMI, level of education, asset index and most of the food and nutrition literacy outcomes (**Table 20**). However, a weak linear correlation was found between marital status and food knowledge ($r_s = .21$ $p = .045$). A weak linear correlation was also found between the CHWs’ BMI and eating behaviours ($r_s = .21$ $p = .035$).

Table 20: Spearman’s correlation between sociodemographic and BMI, food knowledge and nutrition

		<i>Food Knowledge</i>	<i>Meal Planning</i>	<i>Food Preparation</i>	<i>Eating Behaviours</i>	<i>Use of food labels</i>
<i>BMI</i>		.09	-.07	.06	.02*	.13
<i>Age</i>		.11	-.003	.06	.21	.16
<i>Marital Status</i>	r_s, p -	.21*	.05	.08	-.14	-.11
<i>Level of Education</i>	value	.01	-.06	-.10	.04	-.13
<i>Asset Index</i>		-.17	.14	-.09	-.06	-.06

*p-value <0.05

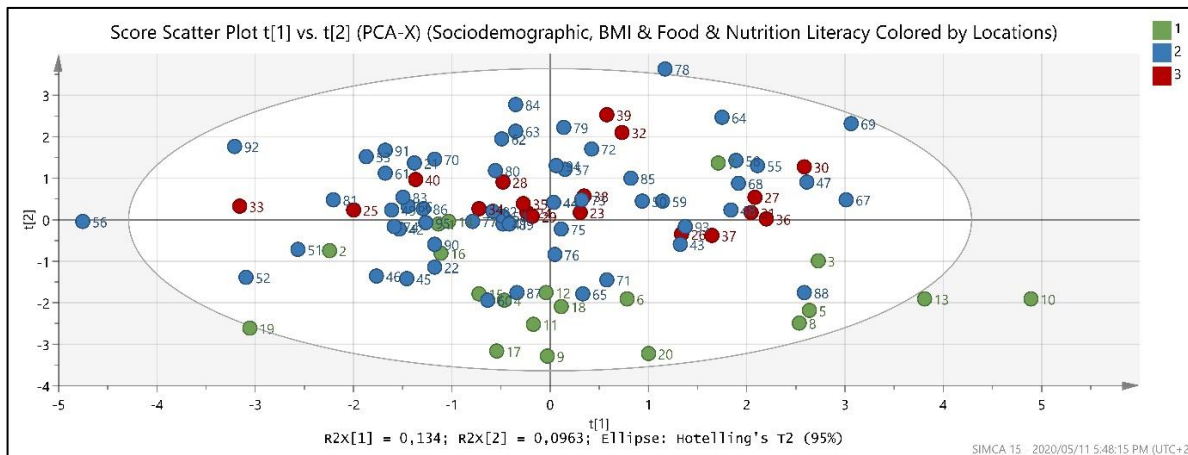
4.7 Principal Component and Orthogonal Partial Least Squares Analysis

4.7.1 Principal Component Analysis using Hotteling’s Scatter Plot

On conducting the principal component analysis (PCA) to see how the data obtained was distributed, the outcomes showed a poor model fit. In fact, the percentage of variation explained by the model was 13% ($R^2X = 0.1340$), and the percent of variation predicted by the model was 10% ($R^2X = 0.0963$) (**Figure 4**).

Figure 4 also presents the outcomes of the PCA using the Hotteling’s Scatter Plot. This plot shows that the majority of the participants’ data fell within the 95% sphere, with the exception of data for participants 10, 13, 56 and 78. Despite these data being outliers, they

did not negatively affect the model. On checking them it was found out that they were valid outcomes.



Note: 1-Kensington, 2-Nyanga, 3-Gugulethu

Figure 4: PCA using Hotteling’s scatter plot

4.7.2 PCA Analysis using Loading Scatter Plot

The Loading Scatter Plot (Figure 2) on the other hand showed that most of the food and nutrition literacy variables clustered together (i.e. positively correlated with each other), whereas majority of these variables tended to cluster opposite to the BMI outcomes of the participants (i.e. they negatively correlated to it). For example, in this analysis, scoring high on good food and nutrition behaviors such as the consumption of fresh fruits daily, consuming fruit and vegetables as snacks during the day and reading food labels tended to cluster together (i.e. positively correlated). The current analysis also showed that these good food and nutrition behaviors clustered opposite to the BMI, suggesting that when the BMI of the participants increased their scores for good food and nutrition behaviours decreased.

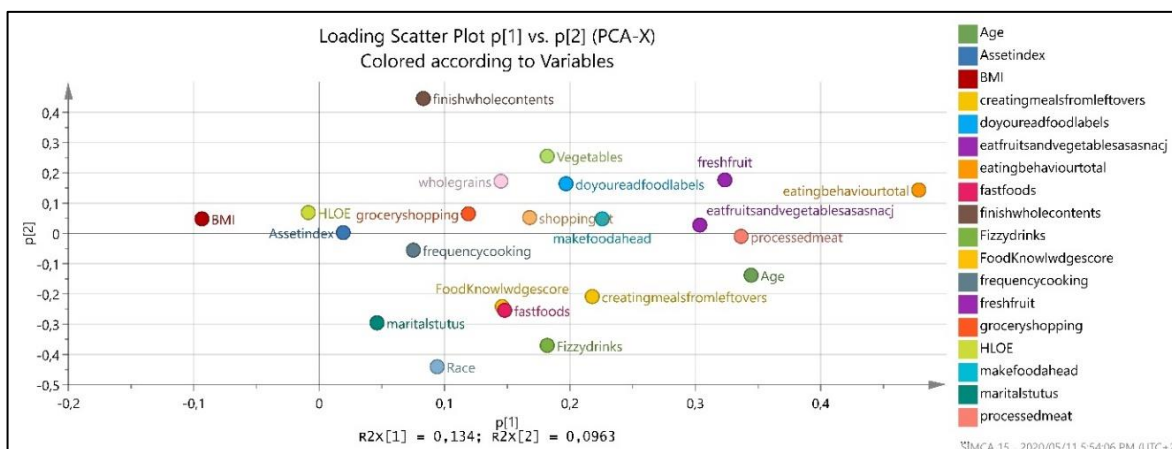


Figure 5: PCA loading: p [2] within group & p[1] between groups variations.

4.7.3 Orthogonal Partial Least Squares (OPLS)

When it comes to conducting the Orthogonal Partial Least Squares (OPLS) analysis, on plotting the observed versus predicted data, imperfect scatter plots were produced (i.e. plots with R2 values that were equal to 0.1911 [BMI, Figure 6 (a)] and 0.1539 [food knowledge, Figure 6 (b)]).

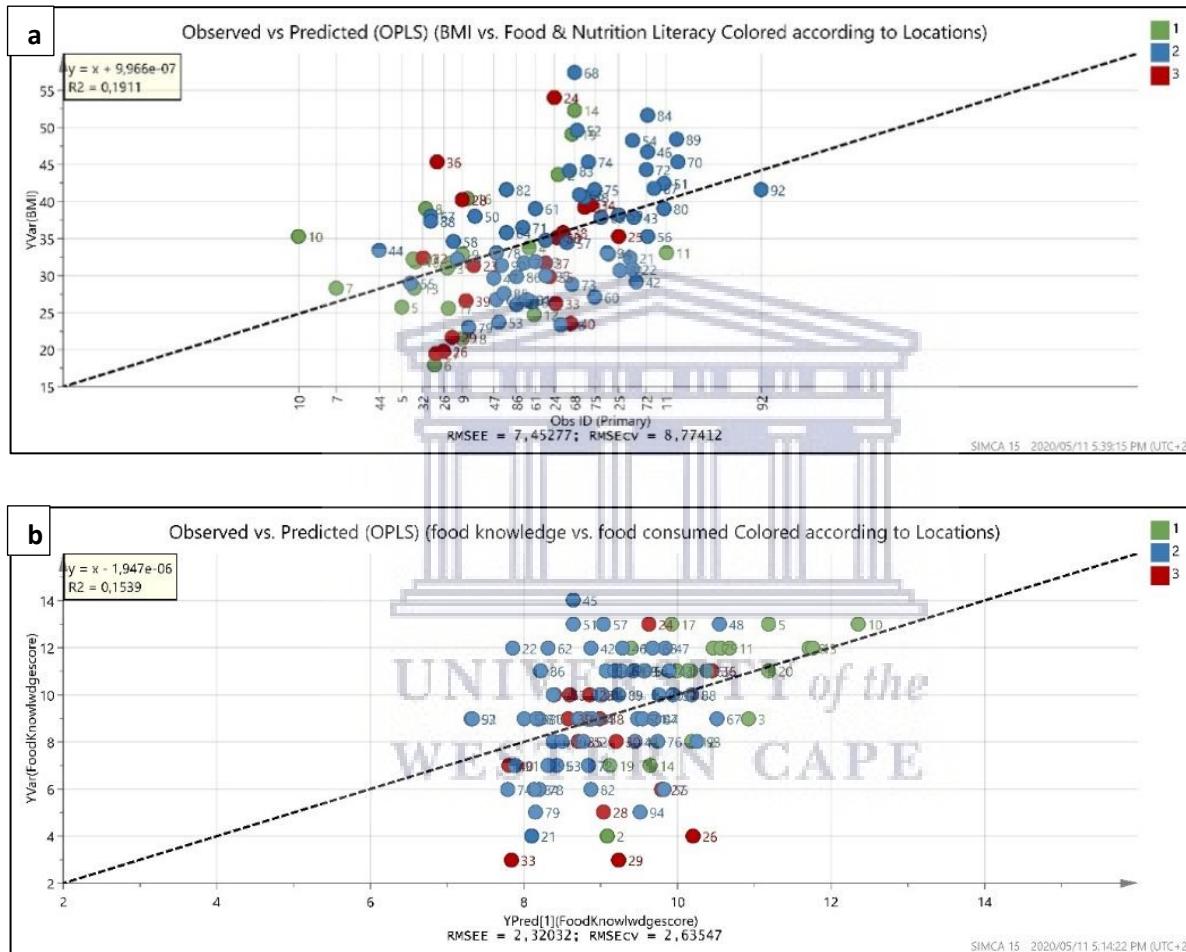


Figure 6: Orthogonal Partial Least Squares (OPLS) analysis: BMI vs Nutrition Literacy (a); Food knowledge vs Food consumed (b): **1-Kensington, 2-Nyanga and 3-Gugulethu townships**

Finally, when attempting to show the factors that significantly associated with the BMI (Figure 7a) and the food knowledge (Figure 7b) of the participants, the outcomes confirmed that the only factor that significantly associated with the BMI of the participants was the score of consuming fresh fruit (the confidence intervals did not include zero). This meant that when the fresh fruit consumption score decreased, the BMI of the participants increased. When it comes to the factors that had significant influence on food knowledge, the race, age, creating healthy meals

from leftovers, consuming whole grains and scoring high on consuming less fizzy drinks positively correlated to food knowledge. All the confidence intervals for these outcomes did not include zero.

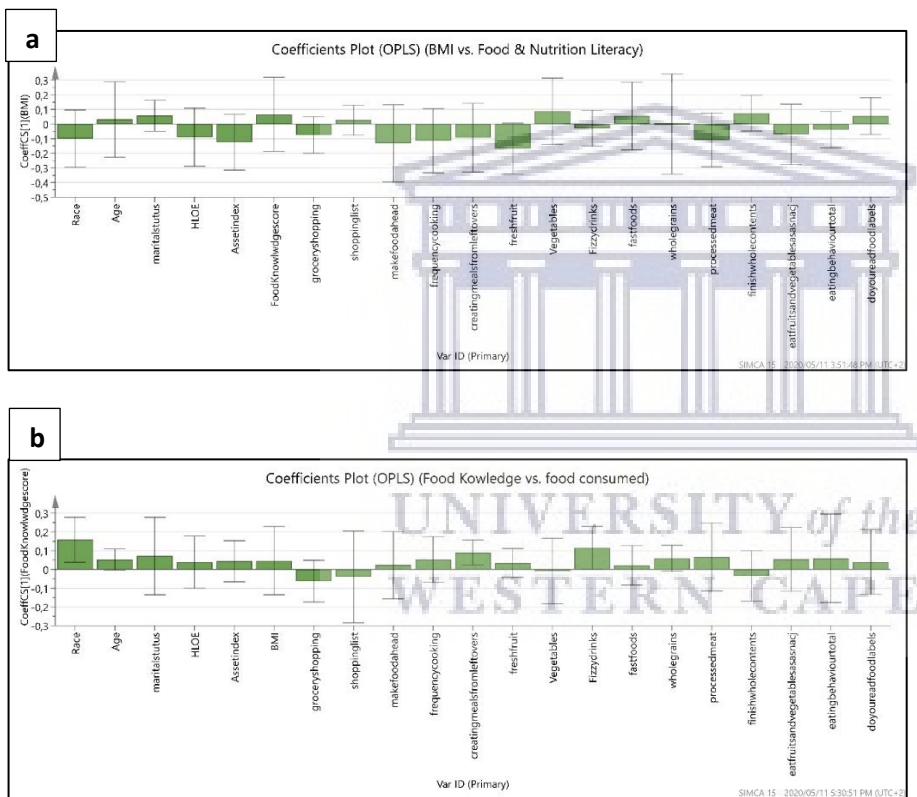


Figure 7: OPLS analysis: Regression analysis between (a) the body mass index (BMI) and (b) food knowledge versus other sociodemographic variables as well as variables on nutrition literacy.

CHAPTER 5: DISCUSSION

5.1 Introduction

This chapter focuses on discussing the findings of this research. Different research studies were used to either corroborate or contrast the findings and the limitations of the study are also discussed.

5.2 Key findings

Majority of participants in this study were found to be either overweight or obese. Participants were found to have fairly good food knowledge, and they had acceptable levels of meal planning. Participants self reported to high levels of use and understanding of food labels. In this study it was also found that participants were found to have risky eating behaviours. Significant differences were found between household asset and BMI as well as between the level of food knowledge and race. Furthermore, results showed that the scores for fruit consumption was negatively associated with the BMI of participants. Race, age, creating healthy meals from leftovers, as well as the consumption of whole grain vegetables and fizzy drinks on the other hand, were associated with the CHWs' food knowledge.

5.3 Socio-demographic profile

The current study showed that more than one third of CHWs were within the age group 35 to 44 years followed by 24.2% that were between the ages of 45 and 54. These results are slightly different from those of other studies that were also conducted in South Africa among CHWs (White, Govender and Lister, 2017; Tsolekile, Schneider and Puoane, 2018; Nyalunga *et al.*, 2019). All these studies found that the majority of CHWs were between the ages of 31 and 40 years. Nyalunga *et al.* (2019) for instance, recently published a study conducted with CHWs in a different province (Gauteng). Their results showed that more than two thirds of the CHWs were within the age group 21 to 40 years. Nyalunga's results also corroborated those of Jassat *et al.* (2011) in an audit of CHWs conducted in the districts of North West Province. In this study we see contrasting results when compared to the above studies with CHWs from this non-profit organisation older. This could be because St John non-profit organisation has retained CHWs that started with the community health programme years back and the organisation is now starting to bring in and train new and younger CHWs as commissioned by the South African Department of Health.

More than 80% of CHWs that participated in the current study reported that they had high school education (i.e grade 8 to grade 12). These results corroborate those of other studies also

conducted in South Africa (Jassat *et al.*, 2011; White, Govender and Lister, 2017; Tsolekile, Schneider and Puoane, 2018). In these studies, it is shown that more than 75% of CHWs (majority) had high school education with most of them having passed grade 11. Taken as a whole, the results of the current study and those of the other afore-cited literature may be a true reflection of South Africans' education system. According to the statistics presented in the Statistics South Africa (2017a) it is shown that more than 45% South Africans who are 19 years and older are not registered in any form of education system. Most of them have secondary school education. However, they are either employed as lay workers or occupy other less paying job opportunities, of which community health work is one.

In the current study we found that the majority (43.2%) of participants were single. This percentage did not include 4.2%, and 3.2% of those who were cohabiting or divorced, which means that more than 50% of the CHWs who participated in the current research were not married. South African statistics shows that there has been a decline in both civil and customary marriages between the years 2013 and 2017 (Statistics South Africa, 2018). During 2017, the Western Cape Province was found to have a least number of registered marriages and highest number of divorcees compared to other Provinces (Statistics South Africa, 2018). Furthermore, statistics shows that there has been a shift in the age of getting married. In recent years women tend to get married at age 31 years and men at 34 years, which means that people are now generally getting married when they are older when compared to decades before (Statistics South Africa, 2018).

5.4 Overweight and obesity prevalence

South Africa is currently faced with a quadruple burden of diseases (Pinzur, 2018). Literature shows that trends of morbidity and mortality rates caused by communicable diseases (CDs), non-communicable diseases (NCDs) and injuries have increased (National Department of Health, Medical Research Council and DHS+, 1998; Department of Health, Medical Research Council and OrcMacro, 2007; National Department of Health *et al.*, 2019). There are multiple factors which have contributed to shifts in morbidity and mortality trends (Statistics South Africa, 2019), however health and public health experts have raised concerns about the rise of overweight and obesity in South Africa (Otang-Mbeng, Otunola and Afolayan, 2017; K. J. Okop *et al.*, 2019). In the current study we found that more than 80% participants fell outside of the normal BMI spectrum (i.e. they weighed above 25kg/m²), with majority (>70%) of them falling in the obese category. These findings are higher than the 27% and 44% of overweight and obesity prevalence findings reported in the SADHS (2019). These results echo the concern of

likelihood of exacerbated diabetes and cardiovascular diseases in South Africa and other Sub-Saharan countries that Agyemang et al. (2015) and Adeboye et al. (2012) referred to. The systematic review on obesity and its health impact in Africa that was conducted by Adeboye et al. (2012) showed that the problem of overweight and obesity mainly affected women who resided in urban settings than rural settings. Though we didn't conduct these comparisons in this study, it is important to note that the participants in this study were women who resided in an urban setting.

Most studies (Puoane *et al.*, 2005; Onyebukwa, 2011; Kyle *et al.*, 2017; Phetla and Skaal, 2017) that have been conducted globally have found that the prevalence of overweight and obesity among healthcare workers have increased. For instance, Kyle et al. (2017) found that in Canada the prevalence of obesity was high across all healthcare professionals, however the unregistered care workers had the highest prevalence of 31.9%. A cross sectional study conducted by Dankyau et al. (2016) among healthcare workers in a tertiary hospital in Nigeria also showed that the prevalence of overweight and obesity was 31.4% and 23.2% respectively. Another study conducted by Otang-Mbeng et al. (2017) in South Africa confirmed that overweight and obesity among healthcare workers have increased. In this study Otang-Mbeng et al. (2017) also showed that health workers had 19% overweight and 38% obesity prevalence. These studies corroborate the findings of the current study that suggests that, indeed the prevalence of overweight and obesity is increasing higher since the prevalence of both overweight and obesity in the current study was much higher than that found in the ofore-mentioned previous South African studies. There is an urgent need for interventions to counter these concerns regarding body sizes in the CHWs operating in the Western Cape, South Africa.

5.5 Food knowledge outcomes

In terms of food knowledge, according to the descriptive statistics performed in the current study, it was shown that Mixed Ancestry participants scored significantly higher when compared to their Black South African counterparts. The differences in dietary knowledge among different races were also shown by Peltzer (2004). These differences could be explained by different environments and settings in which the participants grew up. For instance, most black people that reside in the Western Cape Province grew up in the rural Eastern Cape Province where sources of reliable health information are mostly scarce (Statistic South Africa, 2019). Though it was not significant, but it is important to note that majority of participants with average and

acceptable food knowledge in this study were obese. This is quite concerning as it may mean that people do not always put their food knowledge into practice.

Another interesting finding showed using the PCA and the OPLS analyses, when the CHWs' food knowledge increased, their age, score of preparing healthy meals using left over foods, and score of incorporating whole grain cereals in meals also increased.

5.6 Nutrition literacy

In the current study we also observed that most participants had reasonable levels of meal planning. More than 50% CHWs reported to draft a grocery list and prepare meals ahead of time. Dubowitz et al. (2015) found that drafting a grocery list was associated with healthy eating. The current study further highlighted that grocery shopping list was useful as it reminded people about what they need to purchase, limiting impulsive purchasing as well as ensuring that people bought diverse types of foods with nutritional benefits. Another study conducted by Ducrot et al. (2017) among French adults also found similar results. In this study it was further highlighted that women who planned meals ahead of time had lower odds of being overweight. However, in this study we found no association between BMI and meal planning. The difference between the current study and Ducrot study may be due to the differences in the levels of economy between the two countries. In fact, the participants in the Ducrot et al. (2017) study were from affluent communities, whereas the participants in the current study had financial constraints.

South Africa is still battling with some critical issues of poverty and food insecurity. It is no surprise that regardless of the evidence the European and American studies provide about the importance of meal planning, in South Africa there is limited to no literature that refers to the importance of preplanning for meals that this study's results could be compared to. The Statistics South Africa poverty trends report estimated that more than 50% of the South African population lives below the poverty line, with that about 28% live within extreme hunger (Statistics South Africa, 2017b). This shows that poverty is still a critical issue in South Africa hence most studies are still focusing on researching about food insecurity and giving less attention to some other critical food related strategies such preplanning for meals.

The current study also showed that more than 67% of the participants prepared home cooked meals often. Several studies have shown that people who prepare and consume more meals at home are found to be healthier (Wolfson and Bleich, 2015; Mills *et al.*, 2017; Wolfson, Leung and Richardson, 2019). An example of these studies is a cross sectional study that was conducted

by Mills et al. (2017) among United Kingdom adults. In this study Mills et al. (2017) showed that participants who consumed more than 5 meals at home were more likely to consume more fruits and vegetables daily. The current study found no association between high levels of food preparation and BMI. However, it showed that when the score of fruits consumed decreased the BMI of the CHWs increased.

Evidence of note in South Africa is that Black South Africans, specifically those residing in urban townships tend to use excessive cooking oil, sugar and salt when preparing food (Temple and Steyn, 2013; Menyau *et al.*, 2017).

South African Dietary Food Based Guidelines promote the need to consume variety of foods to ensure that people get enough nutrients (Vorster, Badham and Venter, 2013). These guidelines further highlight the importance of creating meals around vegetables and fruits while limiting the use of sugary and fatty foods. The current study's findings show that about 15.8% and 26.3% consumed fruits and vegetables daily while 5.3% and 4.2% reported to consume fruits and vegetables more than once a day. From these findings it is clear that there were more than 50% participants who did not meet the SA guidelines set for consumption of fruits and vegetables. The current study's results corroborate other studies conducted in South Africa. For instance, Labadarios *et al.* (2011) showed that in South Africa, the black population consume less fruits and vegetables. Furthermore, Okop *et al.* (2019) showed that in the disadvantaged communities of the Western Cape, there were only 37% participants who consumed fruits and vegetables. Consumption of fruits and vegetables improves health and reduces the risks of obesity (Pem and Jeewon, 2015; Conner *et al.*, 2017; Nour *et al.*, 2018). International literature also shows that people are aware of the benefits provided by fruits and vegetables however, as seen in the current study and other studies this knowledge is not always translated to action (Huang, Edirisinghe and Burton-Freeman, 2016; Appleton *et al.*, 2019; Okop *et al.*, 2019).

Overconsumption of sweetened beverages is one of the obesity risk factors mentioned by (Arsenault, Lamarche and Després, 2017). There have been several studies that have been conducted in South Africa, and most of these have found a relationship between high consumption of sweetened beverages and obesity (Ronquest *et al.*, 2015; Nakhoda and Wiles, 2018; Okop *et al.*, 2019). As a measure to reduce obesity rates in South Africa a sugar tax was introduced (Department of Health South Africa, 2018). However, the results from the current study show nothing much has changed since the enactment of the sugar tax guidelines. In fact, over 53% participants in the current study reported consuming fizzy drinks either 2-5 times a week or daily, with 8.4% of these reporting to consume fizzy drinks more than once a day.

Though no association was found between risky eating behaviour and BMI in this study, these outcomes are concerning especially considering that this study's data was collected after the sugar tax was implemented in South Africa.

The majority of participants in the current study reported that they did grocery shopping often. In the current study it was also found that more than 90% of participants read food labels when grocery shopping. However, a quarter of these participants did not read food labels regularly. There were more than 70% participants who reported that they understood the labels. These results corroborate those of Koen et al. (2018) where they showed that Cape Town consumers had fair knowledge of food and nutrition labels (Koen *et al.*, 2018). In addition to the results on the use and understanding of food labels reported in the current study, a larger study that the current study was part of further followed up with the participants and conducted focus group discussions. From the focus group discussions, it was apparent that most participants focused more on reading the expiry date of the food, instead of reading the nutrition content of food products. Jacobs et al. (2011) found similar results in Potchefstroom and Klerksdorp, where respondents reported that they were mostly interested in the expiry dates when purchasing foods. However, the focus group results from our larger study further showed that participants acknowledged that the health endorsed logos such as those of heart and stroke foundation were the better identifiers of healthy food products.

A cross sectional study conducted in Zimbabwe by Chopera et al. (2014) among rural and urban dwellers showed that reading of food labels was associated with education status, employment status and the locality. The current study however did not find any association between socio demographic characteristics, BMI and the use of food labels. The lack of association might be attributed to the small sample size and lack of variability in the data of the current study.

5.7 Determinants of obesity

In the current study it was observed that the BMI significantly associated with asset index ($p = 0.008$). These findings are similar to those of Wittenberg (2013) where he found that asset index was statistically significant to BMI. He showed that as household asset index increased, the body weight also increased, specifically among black population. However, the current study did not find any significant differences between BMI and other socio-demographic characteristics (age, ethnicity and education level). These results differed from results found in most South African Studies (Malhotra *et al.*, 2008; Wagner *et al.*, 2018) and the differences can be attributed to the small sample size in this study when compared to the other studies.

Another interesting outcomes of the current study that were shown by the PCA and the OPLS analyses were that, some of the nutrition literacy outcomes (scoring high on good food and nutrition behaviours that include the increased consumption of fruits and preparing food in advance, for instance) were negatively associated with the BMI outcomes of the CHWs. However, the only negative significant association observed was between the BMI and the fruit consumption outcome. It becomes important therefore to improve food and nutrition literacy of the CHWs, with emphasis being to promote the consumption of variety of fruits and vegetables daily. Afterall, international literature suggests incorporating fruits and vegetables in a healthy diet to increase success to maintain healthy weight (Greenwood and Stanford, 2008; Charlton *et al.*, 2014; Pem and Jeewon, 2015).

5.8 Limitations

In this study, the investigator tried to minimize bias however recall bias was noted during interviews as some participants were hesitant answering some of the questions. As a result, the researchers had to pursue them to answer all questions, with the hope not to lose participants given the limited number of CHWs.

The study was conducted among the community health workers in one of the non-profit organisations that independently hires and train CHWs using funding from various sources including the health ministry. The organisation has CHWs deployed in different communities (low, middle and in high income communities) in the Western Cape Province. This study purposively selected three study sites in low- and middle-income communities. This was however a small sample size which was not a true representative of the whole CHW population in the entire Western Cape. For this study to produce better results which will be generalizable it would be of importance to repeat the study using a larger sample size, including all six sites of the organisation. Increasing the sample size for this study would also ensure that different sociodemographic characteristics are captured. A study published by Fox *et al.* (2009) indicates that it is important to focus on sampling method and on sampling size when conducting a quantitative study to ensure that sample is representative and that the results are generalizable and can ascertain associations or differences.

In this study the living standard was measured using the household asset index. This was done by asking participants of the household assets in working condition that they had in their homes. One of the disadvantages that was encountered with using asset index is one like that highlighted by Prakongsai (2011, p. 14) emphasising that asset index is a poor proxy for measuring current

household income as it does not provide levels of income or poverty but rather measures welfare. For this reason, we would recommend using a household income construct as an indicator of socio-economic status which gives a direct estimation of the socio-economic status of the household. Though research shows that asking about income have been proven to be a sensitive issue, according to Galobaedes (2006) there are better methods for getting accurate information.

This study measured the level of meal planning and food preparation using a previously validated scale (Kouboukika, Mchiza and Buldeo, *unpublished data*) which was validated among children. In this study we adopted the scale, piloted it in 10 CHWs with similar characteristics to make it suitable for the adult population. We adjusted it accordingly for those constructs that needed adjustment. However, we did not do the rigorous total item analysis to validate it for use in adults. There was also a total of five questions which were asked to ascertain the level of meal planning which were frequency of grocery shopping, making a grocery list, preparing for meals ahead of time, cooking and the frequency of creating meals out of leftovers. With this set of constructs, we could ascertain the level of general meal planning and food preparation, but only to a certain point. What we found was that these constructs were rather broad and left out some other finer details of meal planning and food preparation. Considering that meal planning is still a new subject and under researched globally and in South Africa, we recommend that future studies focus in advancing the scale by Kouboukika et al (*unpublished data*) and validating the new advanced scale. Some constructs that we would suggest for the advanced meal planning scale would be the frequency of drafting menus, frequency of chopping, peeling vegetables or dividing food ahead of time. For food preparation we would suggest advancing the scale and adding questions such as the amount of cooking oil, salt and sugar used when preparing food, the style (frying, boiling, steaming etc.) of food preparation frequently used

CHAPTER 6: RECOMMENDATIONS AND CONCLUSION

6.1. Conclusion

Overall, the CHWs that participated in this study proved to have relatively acceptable level of food and nutrition literacy. Most of these CHWs portrayed good food knowledge as they mostly knew which foods were good to consume and those that should be avoided. More than 50% of the CHWs proved to have acceptable meal planning and food preparation skills with most of them drafting a grocery list, preparing for meals ahead of time and cooking their own meals frequently. In addition, the CHWs reported to read and understand food labels. Despite these acceptable food and nutrition literacy scores, this cannot be regarded as satisfactory since the CHWs should be the most reliable and important source of health information. As such, there is a need to scale-up interventions to improve the food and nutrition literacy of the CHWs to be able to confidently confirm that the health information they impart to the communities they serve is optimal.

Moreover, it is unfortunate that the little knowledge the CHWs had didn't translate to improved BMIs, given that most of them were either overweight or obese. The growing prevalence of overweight and obesity among women and health workers are a concern in South Africa. For this reason, we therefore recommend scaling-up of future interventions that will educate CHWs on the importance of maintaining healthy weight, given that they are the role models to the communities they serve

6.2. Recommendations

In this study we once again see the overarching truth of high prevalence of overweight and obesity among healthcare workers. It is important then that effective and innovative interventions are introduced to reduce this prevalence, especially among health workers to ensure that health workers retain healthy weight as they are mostly regarded as role models and can be influential to the general population. We recommend that future studies focus in developing interventions in social media, multimedia and digital platforms. It is no secret that we are in the fourth industrial revolutions where most people, including CHWs spend most of their time glued on the screens of their devices engaging in different media platforms. Community health workers can use platforms such as social media (WhatsApp and Facebook) to engage with each other on planning meals and on sharing tips in healthy meal preparation. These groups would then need to be monitored by a health specialist who can then assist them where necessary.

The educational digital storytelling is another aspect of media that needs to be explored when developing interventions that are aimed to curb overweight and obesity. Evidence from HIV based interventions have shown that educational digital education is an effective platform, especially in Africa (Ofoegbu et al., 2020). Using interventions similar to the ones that were developed for HIV prevention such as Soul City, Soul Buddies, Intersections, can improve people's knowledge on healthy lifestyle and hopefully impact their behaviors as well. For the stories to be relatable to CHWs, content developers would need to build characters that are health workers embarking of lifestyle changing behaviours through healthy eating and exercise.

Though we did not explore it in this study, however, most studies show that one of the factors that hinder people from exercising is the lack of time to do so. We then recommend that NGOs (which employ CHWs) to allow time for their employees to do physical activities and to provide services which allow them to do so during the day. Studies such as the one conducted by Jakobsen et al. (2017) showed that physical activities performed with other employees were more effective than home based physical activities.

The results in this study showed that CHWs had relatively good food knowledge and good usage and understanding of food labels. Sustainability of such knowledge among this population group is vital as CHWs continuously need to impart this information to their clients. We then recommend that NGOs provide continuous workshops that will cover nutrition and healthy lifestyle in general to ensure that their employees knowledge on the subject remains at optimal level.

This study was one among those conducted in South Africa about the use and understanding of food labels, especially within disadvantage participants. Though in this study we found participants to have good usage and understanding of food labels we would recommend future studies to look closer to identifying the information on the food label consumers understand better and the one they do not understand. This will assist researchers and health service providers to scale up strategies to improve the understanding of such information. Evidence shows that most consumers in South Africa mostly focus on the expiry date than reading the actual nutritional information. Further recommendations on food labels would be for future studies to conduct a randomized controlled study like that conducted by Neal et al. (2017) among the Australian consumers. In this study participants would be randomly assigned to engage with different formats of food labels such as nutrition information panel, the daily intake guide, health

start rating and the multiple traffic light labels. This study would help to understand which food labels are effective for certain population groups.



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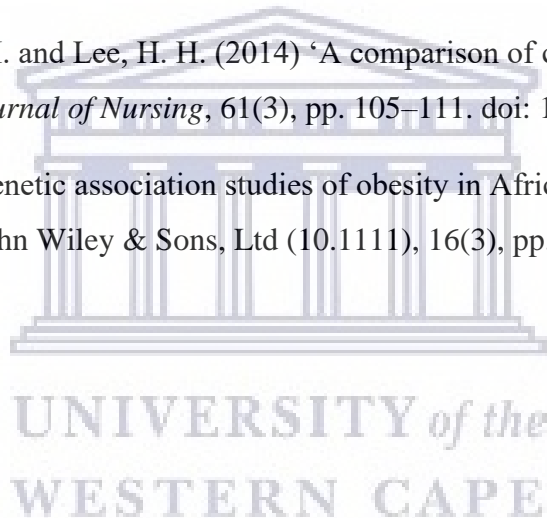
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8. APPENDICES

8.1. Mini-thesis UWC Ethics Approval



OFFICE OF THE DIRECTOR: RESEARCH RESEARCH AND INNOVATION DIVISION

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South Africa
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www.uwc.ac.za

29 October 2019

Ms A Ketelo
School of Public Health
Faculty of Community and Management Sciences

Ethics Reference Number: BM19/8/17

Project Title: Determining food and nutrition literacy of community health workers in the Western Cape, South Africa

Approval Period: 22 October 2019 – 22 October 2020

I hereby certify that the Biomedical Science Research Ethics Committee of the University of the Western Cape approved the scientific methodology and ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report in good time for annual renewal.

The Committee must be informed of any serious adverse event and/or termination of the study.

A handwritten signature in black ink that reads 'Josias'.

*Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape*

<http://etd.uwc.ac.za/>

8.2. St John Letter of Support



UNIVERSITY OF THE WESTERN CAPE

Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2760, Fax: 27 21-959 3686

E-mail: research-ethics@uwc.ac.za

Application Letter for permission to conduct a research study (St John)

Andrico Stephanus

Project manager

St John,

Woodstock

Cape Town

Tel: 021 461-8420

Cell: 078 057 8831

Email: Andrico.Stephanus@stjohn.org.za



RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH WITH COMMUNITY HEALTH WORKERS OPERATING IN THREE CAPE METROPOLE TOWNSHIPS

Research Project Title: Determining food and nutrition literacy of community health workers in the Western Cape, South Africa.

Dear Mr Stephanus

We wish to invite you to a research project that is conducted by Ms Asiphe Ketelo for the degree of Master in Public Health at the University of Western Cape's School of Public Health. Overall, the research aims to explore the body image, food and nutrition literacy of community health workers operating in three Metropole townships (Gugulethu, Nyanga and Kensington), Cape Town. We therefore invite you to work with us in this project because you are the coordinator of the community health worker programme in the three townships. In this study we wish to conduct interviews with the community health workers in the three townships. The interview questions will include socio-demographic characteristics, food knowledge, meal planning, food selection, food preparation, use of food labels and body image perception. Furthermore we wish to take weight and height measurements of the community health workers for body mass index calculations. Interviews will be self-administered and the process will take approximately one hour to complete. Data that will be generated in this research will help the

student to complete her degree. Most importantly, this data will add on the body of literature on obesity and noncommunicable diseases in disadvantaged communities of South Africa and it will also help in planning and refining interventions that are aimed at reducing obesity prevalence among this population.

This research will be conducted by myself (Ms Asiphe Ketelo). Attached is a copy of a letter for research approval by the UWC's Biomedical Research Ethics Committee, a full research proposal, as well as copies of the information sheet, consent form and questionnaires. Upon completion of the study, we will provide your office with a copy of any research outputs that this project might result in.

If you require any further information, please do not hesitate to contact me at 021 959 2465 or email me at 3706574@myuwc.ac.za

Thanking you for your time and consideration in this matter. I look forward to receive your favorable consideration.

Yours sincerely

Asiphe Ketelo

University of the Western Cape

Email: 3706574@myuwc.ac.za

Tel: 021 959 2465/078 057 3496



8.3. Consent forms

8.3.1. English Consent Form

UNIVERSITY OF THE WESTERN CAPE



Private Bag X 17, Bellville 7535, South Africa Tel: +27 21-959 2809, Fax:
27 21-959 2872

E-mail: soph-comm@uwc.ac.za

CONSENT FORM

Title of Research Project: Determining food and nutrition literacy of community health in the Western Cape, South Africa.

The study has been described to me in language that I understand. My questions about the study have been answered. I understand what my participation will involve and I agree to participate of my own choice and free will. I understand that my identity will not be disclosed to anyone. I understand that I may withdraw from the study at any time without giving a reason and without fear of negative consequences or loss of benefits.

Participant's name.....

Participant's signature.....

Date.....

8.3.2. Xhosa Consent Form

UNIVERSITY OF THE WESTERN CAPE



Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809, Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

IFOMU YESIVUMELWANO

Isihloko Sophando: Ukuchaza ulwazi ngokutya looNompilo abasebenza eNtshona Koloni, eMzantsi Afrika

Ophando luchaziwe kum ngolwimi endiluqondayo. Imibuzo yam ngophando iphenduliwe. Ndiyaqonda ukuba inxaxheba yam ibandakanya ntoni kwaye ndiyavuma ukuthatha inxaxheba kungokuzithandela. Ndiyaqonda ukuba iinkcukacha zam azizukuchazwa nakubani na. Ndiyaqonda ukuba ndingarhoxa koluphando nangaliphi na ixesha ngaphandle kokunika isizathu nangaphandle koloyiko lokulahlekelwa ziinzuzo zam.

Igama lomthathi nxaxheba.....

Isityikityo somthathi nhxaxheba.....

Umhla.....

8.3.3. Afrikaans Consent Form

UNIVERSITY OF THE WESTERN CAPE



Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809, Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

TOESTEMMINGSVORM

Titel van Navorsingsprojek: Bepaling van die voedsel-en voedingsgeletterdheid van gemeenskapsgesondheidswerkers wat in Wes-Kaap, Suid Afrika

Die studie is aan my beskryf in 'n taal wat ek verstaan. My vrae oor die studie is beantwoord. Ek verstaan wat my deelname sal behels, en ek stem in om deel te neem uit eie keuse en vrye wil. Ek verstaan dat my identiteit aan niemand bekend gemaak sal word nie. Ek verstaan dat ek te enige tyd aan die studie kan onttrek sonder om 'n rede te gee en sonder vrees vir negatiewe gevolge of verlies aan voordele.



Deelnemer naam

Deelnemer handtekening.....

Datum.....

8.4. Information Sheets

8.4.1. English Information Sheet

UNIVERSITY OF THE WESTERN CAPE



Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809, Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

INFORMATION SHEET

Project Title: Determining food and nutrition literacy of community health workers in the Western Cape, South Africa..

What is this study about?

This is a research project being conducted by the School of Public Health at the University of the Western Cape. We are inviting you to participate in this research project because you are a community health worker who is employed by St John Gate Non-Governmental Organisation and operating in one of the community (Gugulethu, Nyanga or Kensington) where the study will be conducted. The purpose of this research project is to understand factors that predispose community health workers operating in low and middle-income communities to overweight, obesity and non-communicable diseases amongst these being their body size, body image perceptions and their level of food and nutrition literacy.

What will I be asked to do if I agree to participate?

You will be asked to firstly take part in the measurement session, where your weight and height will be measured privately to calculate your body mass index. Secondly, you will be asked to answer a questionnaire that is composed of socio-demographic information, eating behaviour, meal planning, food selection, meal preparation, the use of food labels and questions that are related to your body image perception. The process of both measurements and questionnaire administration will take a maximum of one hour.

Would my participation in this study be kept confidential?

The researchers undertake to protect your identity and the nature of your contribution. To ensure your anonymity, the investigator will not include your name on the survey and on your height and weight measurements record. An identification code will be placed on the survey and on your measurements and only the researcher will be able to link your survey to your identity. Only the researcher will have access to your identification key.

To ensure your confidentiality all collected paper-based information and data will be kept in lockable cabinets in the office of the supervisor and only the supervisor and the primary investigator will have access to these files. The electronic data will be password protected in the researchers' computer. Only the supervisor and the primary investigator will have access to this password. The data generated from this research will be kept for five years as it forms part of a larger project aimed at developing, adjusting and validating a multi-media (MM) educationentertainment (EE) program to improve food and nutrition literacy, as well as body image of

South African women who are residents in the Gugulethu, Nyanga and Kensington townships.

This project received ethics from the University of the Western Cape (UWC) Biomedical Research Ethics Committee (BMREC) on the 14th of January 2019 (Ethics Reference Number: BM18/9/17). After five years, the paper-based data will be shredded and all electronic data will be deleted.

If we write a report or article about this research project, your identity will be protected.

What are the risks of this research?

There may be some risks from participating in this research study. All human interactions and talking about self or others carry some amount of risks. We will nevertheless minimise such risks and act promptly to assist you if you experience any discomfort, psychological or otherwise during the process of your participation in this study. Where necessary, an appropriate referral will be made to a suitable professional for further assistance or intervention.

What are the benefits of this research?

This research is not designed to help you personally, but the results may help the investigator learn more about the factors that expose community health workers to obesity and noncommunicable diseases. We hope that, in the future, other people might benefit from this study through improved understanding of these factors which might lead to focused public health interventions.

Do I have to be in this research and may I stop participating at any time?

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

What if I have questions?

This research is being conducted by Ms Asiphe Ketelo of the School of Public Health at the University of the Western Cape. If you have any questions about the research study itself, please contact Ms Asiphe Ketelo at: School of Public Health, Private Bag X17, Bellville 75335, Cape Town, 021 959 2465 or 078 0573496 or email her at 3706574@myuwc.ac.za

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Prof Uta Lehmann

Head of Department: School of Public Health

University of the Western Cape

Private Bag X17 Bellville 7535

ulehmann@uwc.ac.za

Prof Anthea Rhoda

Dean: Faculty of Community and Health Sciences

University of the Western Cape

Private Bag X17 Bellville 7535

chs-deansoffice@uwc.ac.za

This research has been approved by the University of the Western Cape's Biomedical Research Ethics Committee.

8.4.2. Xhosa Information Sheet

UNIVERSITY OF THE WESTERN CAPE



Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809, Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

Uxwebhu lwenkcazelo

Yintoni imingcipheko yolu phando?

Ingakhona imingcipheko ekuthatheni inxaxheba koluphando. Unxibelelwano lwabantu nangokuthetha ngeziqo zabo kuneemingcipheko enayo. Kodwa nangona kunjalo sizakuyinciphisa imingcipheko kwaye sizakuxhasa ukuba uthe wanengxaki ngokwasengqondweni okanye nangaluphi na uhlobo ngexesha lalenkqubo. Xa kukhona imfuneko, uzakunikwa ireferral ekuthumela kwingcali ukuze ufumana uncedo okanye inkxaso engakumbi.

Yintoni iinzuzo zoluphando?

Olu phando alwenzelwanga ukuba likunceda wena buqu, kodwa iziphumo zinganceda umphandi ekufundeni banzi malunga ngemithelela ebeka oonompilo kumngcipheko wotyeba nokubanezifo ezinganyangekiyo. Sithemba ukuba, kwixesha elizayo, abanye abantu bangazusa koluphando ngokuthi kuqondakale lemithelela kwaye oluphando lusengakhokhelela nakwinkqubo ezigxile ngqo kwezingxaki.

Ndinyanzelekile ukuba koluphando kwaye ndivumelekile ukuyeka ukuthabatha inxaxheba nangaliphi na ixesha

Ukuthabatha inxaxheba kwakho kolu phando kungokuzithandela. Ungakhetha ukungathathi nxaxheba kwaphela. Ukuba ukhetha ukuthatha inxaxheba koluphando, ungayeka ukuthatha inxaxheba nangaliphi na ixesha. Ukuba uthabatha isigqibo sokuba ungathabathi inxaxheba kolu phando okanye ugqiba ukuba uyeke nangaliphi na ixesha,oku akusayi kukufaka engxakini, kwaye awusayi kulahlekelwa ngamalungelo akho afanelekileyo.

Kuthekani ukuba ndinemibuzo?

OLu phando luqhutywa ngu Ms Asiphe Ketelo kwiSikolo Sempilo Yoluntu eDyunivesithi yeNtshona Koloni. Ukuba unemibuzo malunga nolu phando, nceda uqhagamshelane no Ms Asiphe Ketelo eSchool of Public Health, Private Bag X17, Bellville 75335, Cape Town, 021 959 2465 okanye 078 057 3496

okanye nge-email ku 3706574@myuwc.ac.za

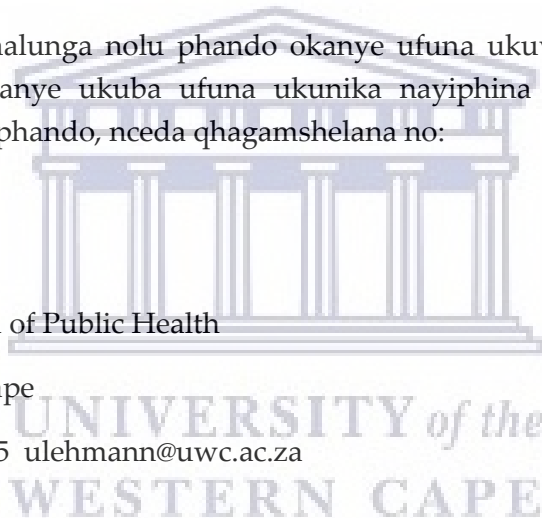
Ukuba ngaba unemibuzo malunga nolu phando okanye ufuna ukuva ngamalungelo akho njengomthathi-nxaxheba okanye ukuba ufuna ukunika nayiphina ingxelo nengxaki oye wazifumana ezidibene nolu phando, nceda qhagamshelana no:

Prof Uta Lehmann

Head of Department: School of Public Health

University of the Western Cape

Private Bag X17 Bellville 7535 ulehmann@uwc.ac.za



Prof Anthea Rhoda

Dean: Faculty of Community and Health Sciences

University of the Western Cape

Private Bag X17 Bellville 7535 chs-deansoffice@uwc.ac.za

Olu phando luxhaswa yiKomiti Yamalungelo Ngophando lweBiomedics kwiYunivesithi yeNtshona Koloni.

Biomedical Research Ethics Committee

University of the Western Cape

Private Bag X17

79

<http://etd.uwc.ac.za/>

Bellville

7535

Tel: 021 959 4111

e-mail: research-ethics@uwc.ac.za

REFERENCE NUMBER: 130416-050



UNIVERSITY *of the*
WESTERN CAPE

8.4.3. Afrikaans Information Sheet

UNIVERSITY OF THE WESTERN CAPE



Private Bag X 17, Bellville 7535, South Africa

Tel: +27 21-959 2809, Fax: 27 21-959 2872

E-mail: soph-comm@uwc.ac.za

INLIGTINGSBLAD

Projek titel: Bepaling van die voedsel-en voedingsgeletterdheid van gemeenskapsgesondheidswerkers wat in Wes-Kaap, Suid Afrika

Waaroor gaan hierdie studie?

Dit is 'n navorsingsprojek wat deur die School of Public Health aan die Universiteit van WesKaapland gedoen word. Ons nooi u uit om deel te neem aan hierdie navorsingsprojek, omdat u

'n gemeenskapsgesondheidswerker is wat werksaam is by die St John Gate-nieregeringsorganisasie en werksaam is in een van die gemeenskappe (Gugulethu, Nyanga of Kensington) waar die studie uitgevoer sal word. Die doel van hierdie navorsingsprojek is om faktore wat gemeenskapsgesondheidswerkers wat in lae- en middelinkomste-gemeenskappe werksaam is, te begryp vir oorgewig, vetsug en nie-oordraagbare siektes, naamlik hul liggaamsgrootte, persepsie van liggaamsbeeld en hul vlak van voedsel en voedingsgeletterdheid.

Wat sal ek gevra word om te doen as ek instem om deel te neem?

U sal gevra word om eerstens deel te neem aan die metingsessie, waar u gewig en hoogte privaat gemeet sal word om u liggaamsmassa-indeks te bereken. Tweedens sal u gevra word om 'n vraelys te beantwoord wat bestaan uit sosio-demografiese inligting, eetgedrag, maaltydbepanning, voedselkeuse, maaltydvoorbereiding, die gebruik van etikette en vroeë verband hou met u persepsie van u beeld. Die proses van meting sowel as die vraelysadministrasie sal hoogstens een uur duur.

Sou my deelname aan hierdie studie vertroulik gehou word?

Die navorsers onderneem om u identiteit en die aard van u bydrae te beskerm. Om u anonimiteit te verseker, sal die ondersoekbeampte u naam nie op die opname en op u hoogte- en gewigmetingsrekord insluit nie. 'n Identifikasiekode sal op die opname en op u metings geplaas word en slegs die navorser kan u opname aan u identiteit koppel. Slegs die navorser het toegang tot u identifikasiesleutel.

Om vertroulikheid te verseker, sal alle versamelde papier-gebaseerde inligting en gegewens in afsluitbare kaste in die kantoor van die toesighouer bewaar word, en slegs die toesighouer en die primêre ondersoeker het toegang tot hierdie lêers. Die elektroniese data sal met die wagwoord op die navorsers se rekenaar beskerm word. Slegs die toesighouer en die primêre ondersoeker het toegang tot hierdie wagwoord. Die data wat uit hierdie navorsing gegenereer word, sal vir vyf jaar gehou word, aangesien dit deel vorm van 'n groter projek wat daarop gemik is om 'n multimedia-opleidingsprogram (MM) vir onderwys- en voedingsgeletterdheid te ontwikkel, aan te pas en te bekragtig. as liggaamsbeeld van Suid-Afrikaanse vroue wat inwoners is in die Gugulethu-, Nyanga- en Kensington-townships. Hierdie projek het op 14 Januarie 2019 etiek ontvang van die Universiteit van Wes-Kaapland (UWK) se biomediese navorsingsetiekomitee (BMREC) (Etiekverwysingsnommer: BM18 / 9/17). Na vyf jaar word die papiergebaseerde data versnipper en alle elektroniese gegewens geskrap.

As ons 'n verslag of artikel oor hierdie navorsingsprojek skryf, sal u identiteit beskerm word.

Wat is die risiko's van hierdie navorsing?

Deelname aan hierdie navorsingstudie kan moontlike risiko's behels. Alle menslike interaksies en om oor self of ander te praat hou 'n mate van risiko's in. Ons sal sulke risiko's egter minimaliseer en vinnig optree om u te help as u ongemaklik, sielkundig of andersins ervaar tydens u deelname aan hierdie studie. Waar nodig, sal 'n toepaslike professionele persoon verwys word vir verdere hulp of ingryping.

Wat is die voordele van hierdie navorsing?

Hierdie navorsing is nie bedoel om u persoonlik te help nie, maar die resultate kan die ondersoeker help om meer te wete te kom oor die faktore wat gemeenskapsgesondheidswerkers aan vetsug en nie-oordraagbare siektes blootstel. Ons hoop dat ander mense in die toekoms ook voordeel kan trek uit hierdie studie deur 'n beter begrip van hierdie faktore wat tot gefokusde openbare gesondheidsintervensies kan lei.

Moet ek aan hierdie navorsing deelneem en mag ek op enige tydstip ophou deelneem?

U deelname aan hierdie navorsing is heeltemal vrywillig. U kan kies om glad nie deel te neem nie. As u besluit om aan hierdie navorsing deel te neem, kan u op enige tydstip ophou deelneem. As u besluit om nie aan hierdie studie deel te neem nie, of as u ophou om op enige tydstip deel te neem, sal u nie gepenaliseer word of enige voordele verloor waarvoor u anders kwalifiseer nie.

Wat as ek vrae het?

Hierdie navorsing word uitgevoer deur me Asiphe Ketelo van die School of Public Health aan die

Universiteit van Wes-Kaapland. As u enige vrae het oor die navorsingstudie, kontak me Asiphe Ketelo by: School of Public Health, Privaatsak X17, Bellville 75335, Kaapstad, 021 959 2465 of 078 0573496 of e-pos haar na 3706574@myuwc.ac.za

As u enige vrae het rakende hierdie studie en u regte as navorsingsdeelnemer, of as u probleme wat u ondervind het rakende die studie wil rapporteer, kontak:

Prof Uta Lehmann

Head of Department: School of Public Health

University of the Western Cape

Private Bag X17 Bellville 7535 ulehmann@uwc.ac.za

Prof Anthea Rhoda

Dean: Faculty of Community and Health Sciences

University of the Western Cape

Private Bag X17 Bellville 7535 chs-deansoffice@uwc.ac.za



Hierdie navorsing is goedgekeur deur die Universiteit van Wes-Kaapland se Biomediese Navorsingsetiekkomitee.

Biomediese Navorsingsetiekkomitee

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REFERENCE NUMBER: 130416-050

8.5. Questionnaires

8.5.1. English Questionnaire



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Participant ID

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Date

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Time

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Location

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Thank you for participating in this study. Please take your time to answer all the questions. All answers are accepted

SECTION A	DEMOGRAPHICS
SECTION B	FOOD SECECTION
SECTION C	FOOD PLANNING
SECTION D	FOOD PREPARATION
SECTION E	EATING BEHAVIOUR
SECTION F	FOOD LABELS

Section A: Socio-demographic information

1. How old are you?

18-24	25-34	35-44	45-54	55-64	65-74
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. What is your marital status?

Single	Married	Living with	Separated	Divorced	Widowed
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. What is your highest level of education?

No schooling	Primary	High School	Diploma	Degree	Post graduate
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. How would you describe your home?

Flat	Hostel	Shack	Brick house	Other
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. What type of household water do you have?

Indoor water	Outside tap	Tank	Communal tap	No water	Other
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. What is your employment status

Unemployed	Part time employed	Self employed	Full time employed
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. What job do you do?

8. Is there another person in your household who is employed?

Yes	No
<input type="radio"/>	<input type="radio"/>

9. How many people are employed in your household

10. Which of the following (in working condition) do you have in your

household at the present time?

Electricity	TV	Fridge	Stove	Microwav	Radio	Computer
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

11. How many people live in your household?

12. Are you diagnosed with any chronic condition (type 2 diabetes, hypertension)?

Yes	No
<input type="radio"/>	<input type="radio"/>

13. Weight____

Height_____BMI

***END OF SECTION A**

Section B: Food knowledge

In the next section we are interested in your knowledge about the different foods. Choose the most correct answer

1. If you have a plate of food how much of it should be:

i. Green vegetables?

Hal	Whole	Quarter	Little bit	None
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Meat/fish/legumes?

Hal	Whole	Quarter	Little bit	None
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

iii. Starch (Rice, pap, samp)

Hal	Whole	Quarter	Little bit	None
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Which food item has the most fat?

Cooke d	Bread	Braai d	Mayonnaise	I don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. When will starchy foods make one gain weight?

When eaten with meat	When eaten with vegetables	When eaten in the mornings	When eaten in large	I don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. How often should oily fish like pilchards and tuna be eaten?

Everyday	Once a week	Twice a week	Twice a	I don't
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Which food is better for a healthy heart?

Fried fish	Tripe (insides)	Roast beef	Grilled chicke	I don't
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Which food is high in fibre?

Chicken	Cheese	Potatoes	Whole grains	I don't
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Which food does not have added sugar

Canne d	Apricot jam	Apricot juice	Fresh apricot	I don't
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Which health problem can one get from taking too much salt?

High blood	Liver failure	Lung disease	High blood	I don't
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Which food contains the most carbohydrates?

Meat	Butter	Cheese	Bread	I don't
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Which foods are HIGHEST in protein? (You can select more than one response)

Apple	White fish fillet	Spaghetti with tomato sauce	Dry legumes (beans, lentils and	I don't know
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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11. According to you, what is a balanced diet?

A diet rich in protein	A diet low in fat	A diet without carbohydrate	A diet containing all the nutrients in	I don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

END OF SECTION B

Section C: Meal Planning

(The following questions are about planning for your meals, please answer as truthful as you can)

1. How often do you the following?

i. Grocery shopping?

Never	Almost never	Sometimes	Often	Very often
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Make a shopping list?

Never	Almost never	Sometimes	Often	Very often
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Do you think planning for meals ahead is important?

Strongly Disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

END OF SECTION C

Section D: Food preparation

(The following questions are about food preparation, please answer as truthful as you can)

1. How often do you cook?

Never	Almost never	Sometimes	Often	Very often	I don't know
-------	--------------	-----------	-------	------------	--------------

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------

2. How often do you create a meal out of leftovers?

Never	Almost never	Sometimes	Often	Very often	I don't know
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

END OF SECTION D

Section E: Eating Behaviors

In this section we will ask you about eating behaviors (please answer as truthfully as possible, there is no right or wrong answer)

How often do you eat the following?

1. Fresh fruits

Never	Once a week	2-5 times a week	Daily	More than once a day
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Vegetables (fresh or frozen)

Never	Once a week	2-5 times a week	Daily	More than once a day
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Fizzy drinks

More than once a day	Daily	2-5 times a week	Once a week	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Fast foods (KFC, Pizza, McDonalds, fried chips, fried fish)

More than once a day	Daily	2-5 times a week	Once a week	Once a	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Whole grains (brown bread, samp, oats)

Never	Once a	Once week	2-5 times a	Daily	More than once
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Processed meat (polony, vienna, cornedbeef)

More than once a day	Daily	2-5 times a week	Once a week	Once a	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. How often do you take your own lunch to work

Never	Almost never	Sometimes	Often	Very often
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Would you say you are able to:

i. Say no to tasty snacks such as finger foods and tasty treats?

Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Resist buying tasty foods that smell good when you are in or close to food outlets?

Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

iii. Eat vegetables or fruits as a snack?

Strongly disagree	Disagree	Somewhat disagree	Somewhat agree	Agree	Strongly agree
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. How often do you eat the total contents of a bag or container of crisps, candies or cookies in one go?

Always	Very often	Sometimes	Rarely	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

END OF SECTION E

Section F: Food labels

1. Do you read food labels (table on the package on the food)?

Ye s	No	Sometimes
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Do you understand food labels (table on the package on the food)?

Ye s	No
<input type="radio"/>	<input type="radio"/>

END OF SECTION F



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8.5.2. Xhosa Questionnaire



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Section A: Socio-demographic information

1. Uneminyaka emingaphi?

18-24	25-34	35-44	45-54	55-64	65-74
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Sithini isimo sakho somtshato?

Anditshatang a	Nditshatile	Ndihlala neqaban e	Anisahlal i ndawony	Wohlukene nomyeni/umfa zi wakho	Umhlokazi/Umhlo o
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Yeyiphi imfundo ephezulu onayo

Andifundang a	Amabang a	Amabanga aphakamilev	Idiploma	Idegree	I-Post graduat
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Ungalichaza njani ikhaya lakho?

Yiflat	Yihostel	Ngumkhukh u	Yindlu yesiten	Lolunye uhlobo
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Loluphi uhlobo lwempompo yamanzi enilusebenzisayo?

Amanzi wasendli ni	Impompo yamanzi engaphandl	Itanki	Itap yasekuhlale ni	Awunaman zi	Olunye uhlobo
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Sithini isimo sakho sempangelo

Awuphangel i	Umsebenz i	Umsebenk zi	Uyazisebenzel a	Olunye uhlobo
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

O	O	O	O	
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7. Wenza umsebenzi onjani?

8. Ukhona omnye umntu ophangelayo endlini yakho, ngaphandle kwakho?

Ewe	Hayi
O	O

9. Bangaphi abantu abaphangelayo endlini yakho, kuquka wena

10. Yeyiphi kwezizinto zilandelayo (esebenzayo) onayo endlini yakho?

Umbane	Umabonakud	Ifridge	Istove	Imicrowav	Iradio	Icomputer
O	O	O	O	O	O	

11. Bangaphi abantu abahlala endlini yakho?

12. Unayo enye yezingxaki zinganyangekiyo (type 2 diabetes, ihigh high)

Ewe	Hayi
O	O

13. Ubunzima_____ Ubude____
I-BMI_____

Section B: Food knowledge

Kule section sinomdla kulwazi lwakho ngokutya okohlukeneyo. Nceda ukhethe eyona mpendulo ichanekileyo

1. Ukuba uneplate yokutya kungakanani okufuneka:

i. Kubeyimifuno eluhlaza?

Yihalf	Konke	Yikota	Kuncinci	Akukho
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Inyama/ifish/ilegumes?

Yihalf	Konke	Yikota	Kuncinci	Akukho
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

iii. Istarch (Rice, pap, samp)

Yihalf	Konke	Yikota	Kuncinci	Akukho
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Kokuphi ukutya okunamafutha amaninzi?

Ispinach esibilisiwev	Isonka	Inyama ebraviwev	Imayonnais e	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Ukutya okunestarch kungakwenza ubemkhulu xa kutheni?

Xa kutyiwa nenvama	Xa kutyiwa nemifuno	Xa kutyiwa ekuseni	Xa kukuninzi	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Iintlanzi ezinamafutha nje ngepilchards netuna kufuneka zityiwe kangakanani?

Yonke	Kanye ngevek	Kabini ngenyang	Kabini ngevek	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Kokuphi ukutya okuyilungeleyo intliziyo esempilweni?

Ifish eqhotsiwev	Ulusu (iinyama zangaphakath)	Inyama yenkomo eroastiwev	Inyama yenkukhu	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Kokuphi ukutya okunefiber okanye iroughage?

Inyama yenkukhu	Icheese	Iitapile	Iinkozo ezipheleleyo (whole)	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Kokuphi ukutya okungenaswekile eyongezelekileyo

I-apricot enkonkxiwe	Ijam ve-	Ijuice ve-	I-apricot	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Yeyiphi ingxaki yempilo engabangelwa kutya kakhulu ityiwa?

Iswekile yegazi enhezul	Iingxaki zesibindi	Isifo semiphunga	Ihigh high	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Kokuphi ukutya okuneecarbohydrates?

Inyama	Ibhotolo	Icheese	Isonka	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Kokuphi ukutya okuneeprotein ezininzi? (Ungakhetha zibeninzi)

Iapil e	Ifish fillet emhlophe	Ispaghetti esine tomato sauce	Iilegumes ezomileyo (beans, lentils)	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Ngokokwakho, yintoni ukutya okupheleleyo (balanced diet)?

Kukutya okuneeprotein ezininzi	Kukutya okunamafutha amancinci	Kukutya okungenazo iicarbohydrates	Kukutya okuqulathe zonke izakhamzimba	Andazi
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Section C: Meal Planning

(Le mibuzo ilandelayo ingokucwangcisa izidlo zakho, nceda

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uphendule ngokunyaniseka kangangoko unako)

1. Uzenza kangakanani ezizinto zilandelayo?

i. Ukuthenga igrocery?

Zange	Manqaphanqaph	Ngamany	Ixesh	Rhoqo
	a	e	a	
O	O	O	O	O

ii. Ukwenza ilist yezinto ozakuzithenga?

Zange	Manqaphanqaph	Ngamany	Ixesh	Rhoqo
	a	e	a	
O	O	O	O	O

iii. Ukuphatha ilunch yakho emsebenzini?

Zange	Manqaphanqapha	Ngamanye amaxesha	Ixesh	Rhoqo
			a	
O	O	O	O	O

2. Ucinga ukuba ukucwangcisa izdlo zakho kwangoko kubalulekile?

Andivume	Andivume	Andivume	Ndivumel	Ndiyavumel	Ndivumel
la ni	la ni	la ni	an a	an a	an a
O	O	O	O	O	O

Section D: Food preparation

Le mibuzo ilandelayo imalunga nokupheka ukutya, nceda uphendule ngokunyanisekileyo kangangoko unako)

1. Upheka amaxesha amangakanani/ Upheka rhoqo kangakanani?

Zange	Manqaphanqaph	Ngamany	Phants	Ngalo	Andazi
	a	e	e lonke	lonke	
		amaxesh	ixesha	ixesha	
O	O	O	O	O	O

2. Uyisebenzisa kangakanani irecipe guide xa upheka?

Zange	Manqaphanqapha	Ngamany	Phantse	Ngal	Andazi
		e	lonke	o	
		amaxesh	ixesha	lonke	
O	O	O	O	O	O

3. Usenza kangakanani isidlo usebenzisa umbeko?

Zange	Manqaphanqapha	Ngamanye e amaxesh	Phantse lonke ixesha	Ngal o lonke	Andazi
O	O	O	O	O	O

4. Ungathi uyakwazi ukwenza isidlo nangezphi na izinto ezikhoyo endlini?

Ndivumel an kakhulu	Ndiyavumel an a	Ndivumel an kancinci	Andivume la kancinci	Andivume la ni	Andivume la ni kwaphela
O	O	O	O	O	O

5. Ungathi uzisebenzisa ngokukhuselekileyo izinto zokupheka (appliances) ekhitshini lakho?

Andivume la ni	Andivume la ni	Andivume la ni	Ndivumel an a	Ndiyavumel an a	Ndivumel an a
O	O	O	O	O	O

Section E: Eating Behaviours

Kule section sizakubuza ngendlela otya ngayo (nceda unike impendulo enyanisekileyo kangangoko unako, akukho mpendulo e-right ne-wrong)

Uzitya kangakanani ezizinto zilandelayo?

1. Iziqhamo ezifresh

Awuzityi kwanhel	Kanye ngeveki	Kabini ukuya kahlanu	Yonke imihla	Kaninzi ngosuku
O	O	O	O	O

2. Imifunlo (efresh okanye efriziweyo)

Awuyity i kwapnel	Kanye ngevek i	Kabini ukuya kahlanu	Yonke imihla	Kaninzi ngosuk u
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Iziselo ezihlwahlwazayo

Kaninzi ngosuku	Yonke imihla	Kabini ukuya kahlanu	Kanye ngevek i	Awuzity i kwapnel
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Ukutya okukhawulezileyo okanye iifast foods (KFC, Pizza, McDonalds, fried chips, fried fish)

Kaninzi ngosuku	Yonke imihla	Kabini ukuya kahlanu	Kanye ngevek i	Kanye ngenyan ga	Awukut yi kwapnel
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Iinkozo ezipheleleyo okanye iwhole grains (brown bread, samp, oats)

Awuzity i kwapnel	Kanye ngenyan ga	Kanye ngevek i	Kabini ukuya kahlanu	Yonke imihla	Kaninzi ngosuk u
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Inyama enezinto ezongeziweyo (polony, vienna, corned beef)

Kaninzi ngosuku	Yonke imihla	Kabini ukuya kahlanu	Kanye ngevek i	Kanye ngenyan ga	Awukut yi kwapnel
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Ungathi uyakwazi:

i. Ukuthi hayi kwisnacks ezimnandi nje ngefinger snacks nezimuncumuncu?

Andivume la ni	Andivume la ni	Andivume la ni	Ndivumel an a	Ndiyavumel an a	Ndivumel an a
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Ukuxhathisa ukuthenga ukutya okumnandi, okunuka kamnandi xa ukwi ndawo ezithengisa ukutya okanye xa ukufitshane neendawo ezithengisa ukutya?

Andivume la ni	Andivume la ni	Andivume la ni	Ndivumel an a	Ndiyavumel an a	Ndivumel an a
O	O	O	O	O	O

iii. Ukutya iveg okanye ifruit nje ngesnack?

Andivume la ni	Andivume la ni	Andivume la ni	Ndivumel an a	Ndiyavumel an a	Ndivumel an a
O	O	O	O	O	O

8. Uyitya kangakani ipakethi yonke yeecrisps, iilekese okanye yamaqebengwana?

Rhoqo	Amaxesh a	Ngamany e	Manqaphanqaph a	Zange
O	O	O	O	O

Section F: food labels

1. Uyazifunda iilabels ezisekutyeni (itable ekwipakethi yokutya)?

Ewe	Hayi	Ngamanye amaxesha
O	O	

2. Uyaziqonda iilabels zokutya (itable ekwipakethi yokutya)?

Ewe	Hayi
O	O

8.5.3. Afrikaans Questionnaire



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Deelnemer ID

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Datum

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Tyd

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Plek

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Dankie dat u aan hierdie studie deelgeneem het. Neem u tyd om al die vrae te beantwoord. Alle antwoorde word aanvaar

AFDELING A	DEMOGRAFIE
AFDELING B	VOEDSELKENNIS
AFDELING C	VOEDSELBEPLANNING
AFDELING D	VOEDSEL VOORBEREIDING
AFDELING E	EET GEDRAG
AFDELING F	VOEDSELETIKETTE

Afdeling A: Sosio-demografiese inligting

14. Hoe oud is jy?

18-24	25-34	35-44	45-54	55-64	65-74
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Wat is jou huwelikstatus?

Enkel	Getroud	Woon saam met 'n maat	Apart	Geskei	Weduwee
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Wat is jou hoogste vlak van onderwys?

Geen skool	Primêre Skool	Hoër Skool	Diploma	Graad	Nagraads
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Hoe sou u u huis beskryf?

Woonstel	Koshuis	Sinkhuis	Baksteenhuur	Ander
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Watter tipe huishoudelike water het u?

Binnenshuise water	Buite kraan	Tenk	Gemeenskaplike kraan	Geen water	Ander
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Wat is u status?

Werkloos	Deeltyds in diens	Selfstandig	Voltyds in diens
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Watter werk doen u?

21. Is daar 'n ander persoon in u huishouding wat in diens is?

Ja	Nee
<input type="radio"/>	<input type="radio"/>

22. Hoeveel mense werk in u huishouding?

10. Watter van die volgende (in werkende toestand) het u tans in u huishouding

Elektrisiteit	TV	Yskas	Stoof	Mikrogolf	Radio	Rekenaar
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

10. Hoeveel mense woon in u huishouding?

10. Word u gediagnoseer met enige chroniese toestand (tipe 2-diabetes, hipertensie)

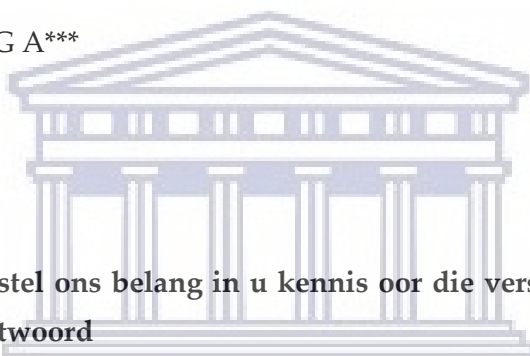
23.

Ja	Nee
<input type="radio"/>	<input type="radio"/>

24. Gewig _____

Lengte _____ BMI

EINDE VAN AFDELING A



Section B: Voedselkennis

In die volgende afdeling stel ons belang in u kennis oor die verskillende voedselsoorte.

Kies die mees korrekte antwoord

12. As u 'n bord kos het, hoeveel daarvan moet die volgende bevat:

i. Groen groente?

Helfte	Heel	Kwart	Bietjie	Geen
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Vleis/Vis/Peulgewasse?

Helfte	Heel	Kwart	Bietjie	Geen
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

iii. Stysel (Rys, pap, stampmielies)

Helfte	Heel	Kwart	Bietjie	Geen
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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13. Watter voedselitem het die meeste vet?

Gekookte Spinasie	Brood	Braai vleis	Mayonnaise	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14.

15. Wanneer sal styselagtige voedsel mens gewig laat optel?

As dit met vleis geëet word	As dit met groente geëet word	As dit in die oggend geëet word	As dit in die groot hoeveelheid geëet	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Hoe gereeld moet olierige vise soos pilchards en tuna geëet word?

Elke dag	Eenkeer 'n week	Twee keer 'n week	Twee keer 'n maand	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Watter kos is beter vir 'n gesonde hart?

Gebraaide vis	Tripe (binnekant)	Gebraaide beesvleis	Geroosterde hoender	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Watter voedsel bevat baie vesel?

Hoender	Kaas	Aartappel	Volgraan	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. Watter voedsel het nie suiker bygevoeg nie?

Ingemaakte appeldoos	Appelkooskonfyt	Appelkoos sap	Vars appelkoos	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Watter gesondheidsprobleem kan mens kry deur te veel sout in te neem?

Hoë bloedsuik er	Lewerversak ing	Long siekte	Hoë bloeddru k	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Watter voedsel bevat die meeste koolhidrate?

Vleis	Botter	Kaas	Brood	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. Watter voedsel bevat die hoogste proteïenprodukte? (U kan meer as een antwoord kies)

Appel	Witvisfil et	Spaghetti met tamatiesous	Droë peulgewasse (bone, lentils en erties)	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. Wat is volgens u 'n gebalanseerde dieet?

'n Dieet ryk aan proteïene	'n Dieet laag in vet	'n Dieet sonder koolhidrate	'n Dieet wat al die voedingstowwe in regte hoeveelhede	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** EINDE VAN AFDELING B***

Afdeling C: Maaltydbe planning

(Die volgende vrae handel oor die beplanning van u maaltye. Beantwoord asseblief so waar as moontlik)

Hoe gereeld doen u die volgende?

i. Inkopies?

Nooit	Amper nooit	Somtyds	Gere eld	Baie gereeld
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Maak 'n inkopielys?

Nooit	Amper nooit	Somtyds	Gere	Baie
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<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
iii. Neem u eie middagete werk toe?				
Nooit	Amper nooit	Somtyds	Gereeld	Baie gereeld
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Dink jy dit is belangrik om vooruit te eet?

Sterk verskil	Verskil	Ietwat verskil	Ietwat stem	Stem	Stem heeltemal saam
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** EINDE VAN AFDELING C***

Afdeling D: Kosvoorbereiding

(Die volgende vrae handel oor voedselbereiding, beantwoord asseblief so waar moontlik as moontlik)

3. Hoe gereeld kook u?

Nooit	Amper nooit	Somtyds	Gereeld	Baie gereeld	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Hoe gereeld kook u volgens 'n resepteboek?

Nooit	Amper nooit	Somtyds	Gereeld	Baie gereeld	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Hoe gereeld skep u 'n maaltyd uit die oorblyfsels?

Nooit	Amper nooit	Somtyds	Gereeld	Baie gereeld	Weet nie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Sou u kan sê dat u 'n maaltyd kan berei uit die bestanddele wat u in die huis het?

Stem baie	Stem	Stem bietjie	Ietwat stem nie	Verskil	Verskil baie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Sou u sê dat u verskillende apperate veilig in u kombuis gebruik?

Verskil baie	Verskil	Ietwat verskil	Stem bietjie	Stem	Stem heeltemal
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

** EINDE VAN AFDELING D***

Section E: Eetgedrag

In hierdie afdeling vra ons u oor eegedrag (beantwoord asseblief so waar moontlik as moontlik)

Hoe gereeld eet u die volgende?

10. Vars vrugte

Nooit	Een keer 'n week	2-5 keer per week	Daadlikse	Meer as een keer per
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. Groente (vars of gevries)

Nooit	Een keer 'n week	2-5 keer per week	Daadlikse	Meer as een keer per day
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Gastoeldrank

Meer as een keer per day	Daadlikse	2-5 keer per week	Een keer 'n week	Nooit
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. Fast foods (KFC, Pizza, McDonalds, fried chips, fried fish)

Meer as een keer per day	Daadlikse	2-5 keer per week	Een keer 'n week	Nooit
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Onversoete graan (brown bread, samp, oats)

Nooit	Een keer 'n week	2-5 keer per week	Daadlikse	Meer as een keer per day
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Verwerkte vleis (polony, vienna, cornedbeef)

Meer as een keer per dav	Daadlikse	2-5 keer per week	Een keer 'n	Nooit
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Sou u se dat u kan?:

i. Se nee vir lekker snacks soos vingerkos en lekker lekkernye?

Verskil baie	Verskil	Ietwat stem nie	Stem bietjie	Stem	Stem baie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ii. Weerstaan om lekker kos te koop wat lekker ruik as u in of naby kos is?

Verskil baie	Verskil	Ietwat stem nie	Stem bietjie	Stem	Stem baie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

iii. Eet groente of vrugte as versnapering?

Verskil baie	Verskil	Ietwat stem nie	Stem bietjie	Stem	Stem baie
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Hoe gereed eet u die totale inhoud van 'n sak of houertjie chips, kerse of koekies op een slag?

Altyd	Baie gereed	Soms	Selde	Nooit
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

*** EINDE VAN AFDELING E***

Section F: Food labels

3. Lees u voedsel etikette (table op die verpakking op die kos)?

Ja	Nie	Soms
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Verstaan u voedsel etikette (table op die verpakking op die kos)?

Ja	Nie
<input type="radio"/>	<input type="radio"/>



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