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An Exploration of Healthy Food and Physical Activity Behaviors and Perceptions among Two Generations of Black Women in Soweto, South Africa

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Abstract

An Exploration of Healthy Food and Physical Activity Behaviors and Perceptions among Two Generations of Black Women in Soweto, South Africa
By Emily A. Phillips

The prevalence of overweight and obesity is on the rise in South Africa, particularly among females living in urban environments. While obesity is a complex issue, research shows that lifestyle, cultural, and environmental factors most likely explain the high prevalence of obesity in South Africa. Risk factors and predictors of obesity among South African females are well documented in the literature; however, there is little research that explores how those at highest risk for obesity are able to maintain a healthy body weight and make healthy lifestyle choices.

The purpose of this qualitative study is to understand how young adult females make healthy lifestyle choices regarding eating and physical activity within the urban, obesogenic environment of Soweto, South Africa. Specifically, it aims to discern how young adult females maintain a normal BMI by exploring the socio-cultural attitudes, beliefs, perceptions, and environmental characteristics of food and physical activity behaviors of young adult females and their mothers who are currently obese. The present qualitative study is nested within Birth to Twenty (Bt20), the biggest and longest running longitudinal study in Africa.

This study utilizes a mother-daughter pair approach, and thirty-two individual interviews were conducted from June-July, 2014 in Soweto-Johannesburg, South Africa. Interviews ranged from 40 to 80 minutes and explored a variety of topics related to food, physical activity, and body size. A multi-tiered case-based and thematic analysis approach was used to gain a rich understanding of potential protective factors against overweight and obesity in the Soweto context. Results indicate a variety of implications for health promotion, the use of behavioral theory in health education, and future research.

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Table of Contents

Chapter 1: Introduction

Problem Definition

The prevalence of obesity is a growing global burden with an estimated 12% of the world's adult population considered obese and about 35% of the world's adult population considered overweight (WHO 2014). Obesity is defined as having a body mass index (BMI) greater than 30kg/m^2 (WHO TRS854), and is a major risk factor for many non-communicable diseases including hypertension, diabetes, heart disease, and certain types of cancer (CDC 2014, WHO 2011). Obesity is not only a burden on developed countries, but has increasingly become a major health concern in developing countries (Prentice 2006, WHO 2014). Developing countries, such as South Africa, are characterized by an epidemiological and nutrition transition that is accompanied by increased prevalence of non-communicable diseases, under nutrition, infectious diseases, and the HIV/AIDS pandemic (Vorster 2002, Torun 2002, Pisa 2012, Steyn 2014, Reddy 2012). Results from the 2012 South African National Health and Examination Survey (SANHANES-1) estimate that 25% of adult South Africans are obese and 22.5% are overweight (Shisana, 2013).

Many studies show that obesity is disproportionately higher among South African females, with a prevalence of 39.2% among females as opposed to 10.6% among males (Shisana, 2013; Alaba 2014). Overweight and obesity among females increased from 56% to 64% over the past decade (Shisana 2013; Puohane 2002). Further, research indicates that women living in South African urban areas have the highest prevalence of obesity (Shisana, 2013; Alaba 2014; Reddy 2012; Crush 2011; Steyn 1997). While

obesity is a complex issue, research shows that lifestyle, cultural, and environmental factors most likely explain the high prevalence of obesity in South Africa (Goedecke 1995, Mickelsfield 2013).

Risk factors and predictors of obesity in the South African context are well documented. Black females are at highest risk of overweight and obesity compared to other ethnicities (Goedecke 1995; Mickelsfield 2013). Factors associated with obesity among females in South Africa include living in an urban area, older age, higher socioeconomic status, marital status, having at least one overweight parent (Mickelsfield 2013, Senekal 2003, Steyn 2011, Whitaker 1997), high birth weight (Mickelsfield 2013), physical inactivity (Mickelsfield 2013), and westernized diets higher in sugar, fats and refined carbohydrates and lower in vegetable and fiberous fruit intake (Alaba 2014; Mickelsfield 2013; Vorster 2014). In addition, studies show that obesity is positively associated with reduced housing density, higher energy intake, commuting by taxi/vehicle, and more money spent on food, all characteristics of a more urban, westernized lifestyle (Mickelsfield 2013). In addition to lifestyle and environmental factors associated with obesity, many cultural and traditional values influence the prevalence of larger body size among black South African females despite the shift towards westernized lifestyles. Larger body size is generally viewed to be a sign of beauty, health, prosperity, and the absence of disease or illness including HIV/AIDS (Alaba 2014). Strong mother-daughter relationships among black South Africans have been found for a number of body size characteristics, including ideal body sizes (Mchiza 2011).

Problem Justification

Predictors of obesity and overweight are well documented in the literature; however, there is little research that documents how some women at high risk for obesity are able to maintain a healthy weight. It is critical to explore and understand potential protective factors against obesity in women who are at high risk but are not overweight. Specifically, there is a shortage of research and information understanding how young adult females make healthy lifestyle decisions around food and physical activity while living in an obesogenic environment in Soweto, South Africa. This research is necessary to inform the development of sustainable, affordable, and community-based solutions to the obesity epidemic in South Africa (Sternin 2002, Mchiza 2013). Further, this study will help fill a gap in the literature by exploring protective health behaviors and perceptions.

Qualitative research methods was the most appropriate approach since this was a formative study. Qualitative research helps explain problems and social phenomenon from an emic perspective (Morse, 1995, Hennink, 2011). Qualitative methods were used in this study to gain an insider's perspective on healthy lifestyle choices around eating and physical activity within the obesogenic environment of Soweto, South Africa (Hennink, 2011). Further, qualitative research provides an opportunity for an in-depth and comprehensive understanding of motives, social and behavioral processes, and people's personal experiences (Castillo-Page, 2012).

This study also uses an intergenerational component to further explore the role of high risk environments. Research is beginning to indicate that there is a correlation between maternal and child body mass index, indicating that the mother-child relationship is important to consider when addressing obesity (Ajslev 2014, Johnson

2012, Whitaker 2010). Both young adults with a normal BMI and their mothers who are considered obese were part of this study. These observations and inquiries, in addition to the development of an adolescent intervention, informed the current formative study in Soweto, South Africa.

Conceptual Frameworks

The application of conceptual and theoretical frameworks to qualitative research benefits the researcher in sensitizing issues that could be missed in solely inductive research (MacFarlane 2012). An integrated theoretical framework based on the Socio-Ecological Model (SEM) and Social Cognitive Theory (SCT) guided the planning of this study (Story 2002). Since this study aims to explore health behaviors and perceptions among two generations of women within an environmental and cultural context, these models help ensure that major and critical domains are included throughout study development and implementation. SCT is defined as a reciprocal and complex relationship between personal factors, environmental influences, and behavior, and includes key concepts such as self-efficacy, reciprocal determinism, observational learning, behavioral capacity, expectations, functional meanings, and reinforcement (Glanz 2008). SEM is an ecological framework that views behavior as affecting and being affected by multiple levels of influence (Glanz 2008; Story 2002). When combined, this integrated theoretical framework views behavior as being a function of multiple levels of influence and stresses the interaction of factors within and across different ecological levels (Story 2002). Eating and physical activity behaviors can be understood through four levels of influence with a variety of SCT mechanisms: individual influences, social environmental influences, physical environment influences, and macrosystem

influences (Story 2002). This integrated theoretical approach guided the development of the interview guides and the deductive component of data analysis.

Formal Statement of Problem

The purpose of this qualitative study is to understand how young adult females make healthy lifestyle choices regarding eating and physical activity within the urban, obesogenic environment of Soweto, South Africa. Specifically, it aims to discern how young adult females maintain a normal BMI by exploring the socio-cultural attitudes, beliefs, perceptions, and environmental characteristics of food and physical activity behaviors of young adult females who have currently obese mothers.

Research Question and Sub-Questions.

How do young adult females make healthy lifestyle choices regarding eating and physical activity while living in the obesogenic environment of Soweto, South Africa?

- How do females born by currently obese caregivers in Soweto, South Africa, maintain a healthy BMI?
- What are the attitudes, beliefs, and perceptions of females born by currently obese caregivers regarding healthy lifestyle choices?
- How is healthy eating and physical activity decision-making embedded in a social-cultural context between two generations of women?

Chapter 2: Literature Review

The following pages provide an overview of the relevant literature on obesity and particularly obesity among females in South Africa, the health transition and urbanization, the mother and daughter relationship in regards to body weight, and cultural and environmental factors surrounding food, physical activity, and body size in South Africa.

Obesity

Obesity is a major public health concern around the world. Obesity is defined as having an abnormal or excessive amount of body fat, which is associated with a higher health risks (World Health Organization (WHO) 2014, WHO TRS854). Body fat (triglycerides) accumulates when energy intake exceeds energy expenditure (WHO TRS854). Some body fat storage is needed for survival; however, excessive body fat leads to a higher risk of morbidity and mortality (WHO TRS854). Obesity is a major risk factor for many non-communicable diseases including hypertension, diabetes, cardiovascular disease, musculoskeletal disorders (such as osteoarthritis), and certain types of cancer (such as endometrial, breast, and colon cancer) (CDC 2014, WHO 2011).

The most commonly used measure of overweight and obesity among adults is body mass index (BMI). BMI is a number calculated by dividing a person's weight in kilograms by the square of his or her height in meters (WHO 2014, Centers for Disease Control and Prevention (CDC) 2014). While BMI is not the perfect measure of obesity, since it does not directly measure body fat, it is a strong indicator in assessing whether a person has elevated health risks because it only requires an individual's height and weight (CDC 2014, WHO TRS854). Therefore, it can be used as a relatively stable

measure of obesity at the population level, compared to other more complicated methods such as skinfold thickness measurements, underwater weighing, bioelectrical impedance, dual-energy x-ray absorptiometry (DXA), and isotope dilution (CDC 2014). Obesity in adults is defined as having a BMI greater than 30 kg/m^2 (CDC 2012).

Global adult obesity rates have been increasing for the past few decades. As of 2008, an estimated 12% of the world's adult population is considered obese and about 35% of the world's adult population is considered overweight (WHO 2014). Since 1980, the prevalence of overweight and obesity rose by 27.5% for adults, and the number of overweight and obese individuals increased from 857 million in 1980 to 2.1 billion in 2013 (Ng 2014).

Health Transition and Urbanization

The concept of the health transition, also known as the nutrition transition, urban transition, or epidemiological transition, first appeared in the literature to explain the population level shifts toward higher rates of morbidity and changes in the main causes of mortality (Caldwell 2001, Mackenbach 1994, Omran 1971, Omran 1977, Omran 1998, World Health Organization 2014). The industrial revolution is often viewed as the historical catalyst for this transition, and as countries became more industrialized, patterns of disease and mortality changed (Caseli 1991, Gottret 2006). These patterns of change include reduced prevalence of infectious diseases, such as tuberculosis, influenza, and polio, and reduced prevalence of malnutrition. In exchange for lower levels of infectious diseases, non-communicable diseases, accidental injuries, and mental health issues are the main causes of morbidity.

Today, as developing countries urbanize and adapt more westernized lifestyles, they begin to experience the health transition, which is resulting in a major increase in global adult obesity and over nutrition (Popkin 2006, Popkin 2011). These westernized lifestyles include diets influenced by fast food industries (Igumbor 2012), higher in sugar, fats, and refined carbohydrates and lower in vegetable and fibrous fruit intake (Alaba 2014; Mickelsfield 2013; Vorster 2014), and higher rates of physical inactivity (Prentice 2006). While it was originally believed that westernized lifestyles would only be associated with the rich within developing countries, research shows that westernized lifestyles are disproportionately affecting low-income urban populations (Crush 2011, Monteiro 2004, Popkin 2006).

The health transition implies a linear progression of change in disease prevalence; however, countries that are experiencing the health transition today face very complicated burdens of disease. Particularly in Africa, developing countries are characterized by a triple burden of disease that is accompanied by increased prevalence of non-communicable diseases, under nutrition, infectious diseases, and the HIV/AIDS pandemic (Vorster 2002, Torun 2002, Pisa 2012, Steyn 2014, Reddy 2012, WHO 2014). This has major implications for healthcare systems, health promotion, and policy.

Obesity in South Africa

As South Africa has transformed into a more developed westernized country, the prevalence of obesity has increased as well. However, there are varying estimates on the prevalence of obesity and overweight in South Africa. Results from the 2012 South African National Health and Examination Survey (SANHANES-1) estimate that 25% of South African adults are obese and 22.5% are overweight (Shisana, 2013). The World

Health Organization estimates that 33.8% of South African adults are obese and about 34% of South African adults are overweight (WHO 2011). The prevalence of obesity in South Africa is comparable to that of the United States, Mexico, Venezuela, Egypt, Jordan, and Belize (WHO 2014).

While obesity is a complex issue, lifestyle, cultural, and environmental factors seem to be the most likely determinants of increased obesity levels observed in South Africa (Goedecke 1995, Mickelsfield 2013). In 2000, it was approximated that excess body weight caused 7% of all deaths (n=36,504) (Joubert 2007). In terms of specific non-communicable diseases, excess body weight contributed to about 87% of type 2 diabetes, 68% of hypertensive disease, 61% of endometrial cancer, 45% of ischaemic stroke, 38% of ischaemic heart disease, 31% of kidney cancer, 24% of osteoarthritis, 17% of colon cancer, and 13% of postmenopausal breast cancer (Joubert 2007). Overall, non-communicable diseases are estimated to account for about 43% of total deaths among South African adults (WHO 2014).

Obesity among Black Females in South Africa

Despite the country-wide increase in obesity, females experience obesity significantly more than men. Many studies show that obesity is disproportionately higher among South African females, with a prevalence of around 40% among females as opposed to 10.6% among males (Shisana, 2013; Alaba 2014, WHO 2014). Obesity among South African females is significantly higher compared to females living in the rest of the continent. The regional (Africa) average of obesity among females is 11% compared to about 40% in South Africa (WHO South Africa: health profile). Further, research indicates that women living in South African urban areas have the highest

prevalence of obesity (Shisana, 2013; Alaba 2014; Reddy 2012; Crush 2011; Steyn 1997). Overweight and obesity among females increased from 56% to 64% over the past decade (Shisana 2013; Puoane 2002).

Risk factors and predictors of obesity in the South African context are well documented. Black females are at highest risk of overweight and obesity compared to other ethnicities (Goedecke 1995; Mickelsfield 2013). Factors associated with obesity among females in South Africa include living in an urban area, older age, higher socioeconomic status, marital status, having at least one overweight parent (Mickelsfield 2013, Senekal 2003, Steyn 2011, Whitaker 1997), high birth weight (Mickelsfield 2013), low birth weight but rapid growth (Richter 2007), physical inactivity (Mickelsfield 2013), and westernized diets higher in sugar, fats and refined carbohydrates and lower in vegetable and fibrous fruit intake (Alaba 2014; Mickelsfield 2013; Vorster 2014). In addition, studies show that obesity is positively associated with reduced housing density, higher energy intake, commuting by taxi/vehicle, and more money spent on food, all characteristics of a more urban, westernized lifestyle (Mickelsfield 2013).

Mother/Daughter Relationship and Intergeneration Effects on BMI

Large studies are beginning to suggest a correlation between maternal and child body mass index, indicating that the mother-child relationship is important to consider when addressing obesity (Ajslev 2014, Johnson 2012, Whitaker 2010). In addition, strong mother-daughter relationships among black South Africans have been found for a number of body size characteristics, including ideal body sizes (Mchiza 2011). Given the finding that South African females are more likely to become obese if they have at least one overweight parent (Mickelsfield 2013, Senekal 2003, Steyn 2011, Whitaker 1997), this

intergenerational aspect of health is important when looking at the role of obesogenic environments on weight status in developing countries.

Obesogenic Environment in Soweto

Soweto, South Africa is an urban township right outside of Johannesburg, South Africa. As of the 2011 Census, the population was 1,271,628 with a population density of 6,357.3 per km2 (Statistics South Africa). About 98.5% of the people living in Soweto are Black Africans, and about 1.0% are Coloured (Statistics South Africa), which is a result from forced segregation during the apartheid era.

Soweto-Johannesburg, South Africa has been characterized as an obesogenic environment in the academic literature (Cameron 2007, Voorend 2012, Sedibe 2014, Yah 2014). The "obesogenicity" of an environment has been defined as "the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations" (Swinburn 1999). This concept includes the physical environment, policies, social and cultural attitudes, values, costs, and laws (Swinburn 2002). An obesogenic environment is one that promotes behaviors that cause obesity, including physical inactivity and unhealthy energy intake, and does not promote behaviors that prevent obesity. Recently, research has focused on how the environment has contributed to the obesity pandemic since individual level factors cannot explain it alone (Kirk 2010). It is necessary to understand the obesogenic context of Soweto when trying to understand obesity among black South African females.

Body Size and Culture

In addition to lifestyle and environmental factors associated with obesity, many cultural and traditional values influence the prevalence of larger body size among black

South African females despite the shift towards westernized lifestyles. Larger body size is traditionally viewed to be a sign of beauty, respect, health, wealth and prosperity, and the absence of disease or illness including HIV/AIDS (Alaba 2014, Mchiza 2011, Puoane 2010). Larger body size among black women also tends to be perceived as a reflection of marital happiness, an escape from food insecurity, and freedom from stress (Mvo 1999). Girls who are obese may view larger body size as advantageous for sports that require strength (Puoane 2010). A woman who is too thin, especially among black South Africans, may be perceived as experiencing illness such as HIV/AIDS (and the associated stigma) or tuberculosis, drug abuse, family or financial stress, sexual, emotional, or physical abuse, or social difficulties (Morris 2013, Alaba 2014, Puoane 2010). These cultural and social values around body size among black women need to inform inquiries and efforts to control the obesity epidemic in South Africa.

Chapter 3: Methods

The study site for this investigation was Soweto, South Africa, and is nested within the Birth to Twenty (Bt20) cohort, a research arm of the Developmental Pathways for Health Research Unit (DPHRU). Bt20 is a longitudinal study initiated by the University of the Witwatersrand in 1990 in Soweto-Johannesburg, South Africa. The overall scope of Bt20 is to track the growth, health, well-being and educational progress of urban South African children throughout the lifespan, and aims to take a multidisciplinary approach to developmental health (Richter 2007). Bt20 includes all singleton children (n=3273) born in Soweto-Johannesburg within a seven-week enrollment period, and were residents of Soweto-Johannesburg for at least 6 months after birth (Richter 2007)[1].

The Bt20 research team has collected data from the Bt20 cohort members and their caregivers on an annual basis since birth. This data includes a vast range of quantitative measures and variables, including growth, socio-economic circumstances, child health, maternal/caregiver stress, child nutrition, child care, cognitive development, education, psychological assessment, neighborhood characteristics, blood pressure, physical activity, bone mass and body composition, pubertal development, biochemical make-up, child risk behavior, sexually transmitted infections, and genetics (Richter 2007).

As previously discussed, qualitative research methods were used to explore potential protective factors against obesity, which was motivated by Bt20 body

[1] Overall attrition rate for Bt20 is about 30% (Norris 2007). As a result, the Bt20 cohort is a representative sample of long-term urban residents of Soweto-Johannesburg (Feeley 2012).

composition data and a gap in the literature. In particular, semi-structured in-depth interviews were used to gain an in-depth perspective on participant's views of health. At the time of this study, Bt20 was in the middle of the most recent wave of data collection, so not all cohort members were considered eligible for this study.

Eligibility and Participant Recruitment

Young adult females and their mothers were purposefully sampled to explore the exception to the increasing trend of overweight and obesity within the Soweto context. Eligibility criteria included: (a) the young adults were part of the Bt20 cohort study, (b) were female, (c) had a BMI in the normal range (between 18.5-24.9 kg/m^2) at the last point of data collection, (d) lived in Soweto, and (e) had a caregiver defined as their biological mother who was obese (BMI over 30 kg/m^2) at the last point of BMI data collection.

The DPHRU Data Manager identified eligible participants through the Bt20 database. First, he identified all of the young adult participants who had completed the most recent wave of Bt20 data collection as of June 12, 2014 (n=1450). Bt20 cohort members ranged from 21.9 to 23.7 years of age at the last wave of data collection. Second, he identified all of the young adults who had a BMI within the normal range of 18.5-24.9 kg/m^2 (n=807). Of the 807 cohort members with a normal BMI, 318 were female (39%). Then, the data manager determined which of the 318 young adult females had caregivers (defined as the main guardian of the young adult) with current BMI data (n=151). Of the 151 caregivers with current BMI data, 86 had an obese BMI (>30 kg/m^2). After establishing which caregivers were also the young adult's biological mother, fifty-

nine Bt20 young adult-mother pairs were eligible for this study. Table 1 demonstrates the process in which the Data Manager narrowed down eligible participants.

Table 1

Purposive Sampling Process within Birth to Twenty (Bt20) Database

Number of Participants/Pairs	Steps in the purposive sampling process
1450	Young adult participants with current BMI data available
807	Young adult participants with BMI between 18.5-24.9 kg/m^2
318	Young adults who are Female
151	Caregivers with current BMI data
86	Caregivers with BMI over 30 kg/m^2
59	**Eligible Young adult and Caregiver (mother) pairs**

Eligible participants were assigned a unique study identification number and pairs were randomly selected to participate (http://randomizer.org). Randomly selected young adult-mother pairs were called by a Bt20 Research Assistant and were invited to participate in the study. Both the young adult and her mother had to be willing to participate in order to be involved. Twenty-six pairs were randomly selected, and 15 pairs completed interviews. Two additional young adults also participated in the study but their mothers did not, which resulted in two discordant pairs. Table 2 demonstrates the study participation result after recruitment.

Table 2

Outcome of Eligible Pair Recruitment

Number of Pairs	Recruitment Outcome
26	Randomly selected Young adult/Mother pairs
15	Completed pairs
2	Discordant pairs (Interview with mother not completed)
4	Declined
4	Unreachable
1	Ineligible (Participating in another study)

Interview Guide

Two semi-structured in-depth interview guides (Appendix 1 & 2) were developed based on the Socio-Ecological Model and previous research outlined in Chapter 2 for both young adults and their mothers. Interview questions related to a) eating and physical activity behaviors, b) perceptions of social and community level factors around eating and physical activity, c) cultural beliefs about diet and body image, and d) the perceived role of the mother's influence on her daughter's weight. Emory University faculty and DPHRU research staff reviewed interview guides for input on topics, question structure, and interview flow. A focus group with Bt20 research staff provided feedback on communication nuances and cultural appropriateness. Five Bt20 research staff who are from Soweto reviewed every question of both interview guides and provided suggestions to edit certain words, remove questions that were too abstract, and add topical probes that would illicit more discussion. A pilot-interview was conducted with two young adult-mother pairs, and subsequent changes to the interview guides were made to improve the natural flow of the conversation and to allow for more probing questions. Interview guides were adjusted throughout data collection to incorporate emerging themes, topics, and probes, and there were three major iterations of each interview guide. Whenever a barrier to healthy eating or physical activity was discussed, the interviewer probed to discern how the participant overcomes that perceived barrier.

Data Collection

Semi-structured, in-depth interviews were conducted at Chris Hani Baragwanath Hospital in Soweto, South Africa, where data collection occurs for the larger Bt20 study. A Bt20 Research Assistant called eligible participants and made appointments if both the mother and young adult were interested in participating. Whenever possible, mothers and

daughters were scheduled to be interviewed on the same day at subsequent times in order to increase the likelihood of interviewing mothers and daughters from the same family and prevent discordant pairs. Interviews were scheduled at a time convenient to the participants. Thirty-two in-depth interviews were conducted in total: 15 pairs and 2 discordant pairs due to scheduling issues. One interview was conducted at the participant's home. Thirty-one interviews were conducted in English, and one interview was conducted in Sesotho. A Bt20 Research Assistant translated from Sesotho to English during this particular interview. Additionally, participants occasionally used words in Sesotho or Zulu to reference certain types of foods. If so, the participants explained what the food was like in English, or the Bt20 research staff provided an explanation for the researcher.

A demographic questionnaire was administered before the interview in order to collect the most up-to-date and relevant data on the cohort members. Demographic data variables included date of birth (only for mothers), marital status, occupation status, education, parental status (only for young adults), and home description (Appendix 3). These demographic variables were identified and worded based on previous surveys by Bt20 to ensure that participants were comfortable answering certain questions.

Written informed consent was collected from each participant before the start of the interview. Prior to the start of the interview, participants were asked to provide a pseudonym in order to protect identity. Participants were reimbursed R70 (approximately 7 USD) for travel and were provided refreshments, including sandwiches, tea, and juice. Interviews lasted about 50-60 minutes but ranged from 22-80 minutes. Data was collected in June-July, 2014.

With written informed consent, interviews were audio recorded on the Voice Record Pro application on a locked cellphone. After the interview, audio files were backed-up to the researcher's personal password protected computer. After the data collection phase, audio recordings were deleted from the application. All interviews were transcribed and de-identified by the researcher. Audio files and transcripts were stored in password-protected files in a password-protected laptop.

This study received approval by the University of the Witwatersrand Ethics Committee and Emory University Institutional Review Board.

Data Analysis

In order to best answer the research questions and incorporate the matched young adult and mother data, a four-tiered data analysis plan was developed. The analysis plan involves four levels of thematic analysis based on the same codebook for both young adults and their mothers (Appendix 4).

After five young adult interviews were transcribed, the transcripts were uploaded into MaxQDA version 10 to begin codebook development. Codes were initially developed by a variety of methods. First, deductive codes were formed based on the interview guides and the research questions. Next, codes were created based on the interviewer's reflections and recollections of the interview, which included themes that stuck out as pertinent to the research questions. Finally, codes were developed through a process called open-coding, which is typically used in grounded-theory studies (Khandkar, 2009). Open-coding entails reading each line of a transcript and creating labels to capture themes and concepts that occur in the data in a way that breaks open the

text (Khandkar, 2009). This led to a few additional inductive codes. The original codebook had 33 codes (30 parent codes and 3 sub-codes).

After applying codes on the first five transcripts and conducting preliminary cross-case analysis, it was clear that the initial codebook was too long. It distorted the context of the interviews which made cross-case analysis less effective. Therefore, a second version of the codebook was created, which combined a number of related codes together, and held more true to the purpose of the study. The final codebook had 19 codes (14 parent codes and 5 sub-codes) (Appendix 4).

The researcher who conducted the in-depth interviews coded all of the transcripts. After the codebook was finalized, a second researcher who was familiar with the study topics and objectives coded a sub-set of transcripts. The two researchers discussed the coding and any discrepancies that arose in order to increase credibility. The researcher used MaxQDA version 11 to code and analyze the data.

Phase One: Case-based thematic analysis within 17 young adults.

In order to understand the knowledge, attitudes, perceptions, and behaviors among young adults around eating and physical activity, a case-based approach was used first. A matrix was set up that described the knowledge, perceptions, and behaviors of healthy eating and physical activity for each participant. Data for these matrices came from codes food/food behaviors, motivations and feelings about food, physical activity/physical activity behaviors, motivations and feelings about physical activity, transportation, and health perceptions. The researcher read through all of these segments in order to understand each participant individually.

Phase Two: Thematic analysis across 17 young adult cases and 15 mother cases.

After each participant was described, thematic analysis was used to look at similarities and themes across the 17 young adults. This process was also used for codes health perceptions, body image/body size, social/cultural perceptions, decision making/overcoming barriers, and recommendations/advice. Thematic analysis across mothers investigated food and physical activity motivations and feelings, health perceptions, body image/body size, recommendations/advice.

Phase Three: Case-based analysis within 15 young adult/mother pairs.

The family relationships/influence code was used primarily as a function code to capture whenever a participant talked about their family members, especially their mother or daughter. Since the interview guides focused on participants talking about either their mother or daughter in relation to food, physical activity, and body image, this code was used to analyze the mother/daughter relationship for each pair.

In order to conceptualize the relationship between mother and daughter, each mother and daughter pair was treated as a case. A matrix was set up to capture discussions the young adult had about her mother and discussions the mother had about her daughter. Then the relationship was abstracted into a few key features based on what the participants talked about in the interviews.

Phase Four: Thematic analysis across 15 young adult/mother pairs.

After each mother and daughter pair was abstracted into key features, thematic analysis was used to look at how young adults with a BMI in the normal range (18.5-24.9

kg/m^2) relate to their mothers who have a BMI in the obese range (>30 kg/m^2) in terms of health and body size.

Chapter 4: Results

This chapter highlights the results of descriptive demographic statistics and the multi-level thematic qualitative analysis. After the demographic statistics, results will highlight young adult food and physical activity behaviors, knowledge, and perceptions. After that, decision making and facilitators to healthy choices will be explored, followed by health perceptions, perceptions of body image and body size, and an examination of the mother and daughter pair relationship. All of the results are in reference to the young adults until the Mother and Daughter Comparison and Mother and Daughter Relationship sections.

Demographic Characteristics of Participants

A total of 32 young adults and mothers participated in this study, of which 17 were young adults and 15 were mothers. There were two discordant young adults that were still included in the analysis. Demographic data was collected from the Birth to Twenty (Bt20) database and the Demographic Questionnaire, which was administered at the time of qualitative data collection (Appendix 3). Table 3 summarizes the demographic characteristics of both young adult and mother participants.

The average age of the young adults was 24.2 years (sd=0.04), and the average BMI was 21.6 kg/m^2 (sd = 1.8). In terms of highest level of education completed or in progress, 1 (5.9%) young adult reached Grade 11, 6 (35.3%) reached Grade 12 and passed Matric, which is similar to graduation, 4 (23.5%) either began or completed a Certificate or Diploma (2 year) program, and 6 (35.3%) either began or completed a Bachelor's degree. Therefore, 10 young adults (59.8%) pursued or began to pursue education after Matric. When asked to specify their marital status, 8 (47.1%) young

adults reported that they were single, 7 (41.2%) reported that they were in a committed relationship with someone they were not living with, and 2 (11.8%) young adults were married. In regards to employment status, 5 (29.4%) young adults reported as being unemployed, 2 (11.8%) worked on a part-time basis, and 10 (58.8%) worked at a full-time job. When asked if they have ever had a child, the majority of young adults (58.8%) said no, 6 (35.3%) said yes, and 1 (5.9%) was pregnant at the time of the interview.

Table 3

Demographic Descriptive Statistics of Participants

Demographic Variable	Young Adults N (%)	Mothers N (%)
Number of Participants	17	15
Age (years)	24.2 (SD = 0.04)	53 (SD = 4.9)
BMI (kg/m^2)	21.6 (SD = 1.8)	36.1 (SD = 3.9)
Education Level		
Grade 6	0 (0.0%)	2 (13.3%)
Grade 8	0 (0.0%)	1 (6.7%)
Grade 10	0 (0.0%)	3 (20%)
Grade 11 (Matric for mothers)	1 (5.9%)	4 (26.7%)
Grade 12 (Matric for young adults)	6 (35.3%)	2 (13.3%)
Certificate/Diploma	4 (23.5%)	2 (13.3%)
Bachelors	6 (35.3%)	1 (6.7%)
Marital Status		
Single	8 (47.1%)	3 (20%)
Committed Relationship	7 (41.2%)	1 (6.7%)
Married	2 (11.8%)	8 (53.5%)
Divorced	0 (0.0%)	1 (6.7%)
Widow	0 (0.0%)	1 (6.7%)
Employment Status		
Unemployed	5 (29.4%)	6 (40%)
Part Time	2 (11.8%)	1 (6.7%)
Full Time	10 (58.8%)	8 (53.3%)
Maternal Status		
Yes	6 (35.3%)	N/A
No	10 (58.8%)	N/A
Pregnant	1 (5.9%)	N/A

The average age of mothers was 53 years (sd = 4.9), and the average BMI was 36.1 kg/m^2 (sd = 3.9). When asked to report their highest level of education completed or in progress, 2 (13.3%) completed Grade 6, 1 (6.7%) completed Grade 8, 3 (20%)

completed Grade 10, 4 (26.7%) completed Grade 11 and passed Matric (Grade 11 was Matric during the apartheid government), 2 (13.3%) completed Grade 12, 2 (13.3%) received a Certificate or Diploma, and 1 (6.7%) received a Bachelor's degree. Of the 15 mothers, 3 (20%) reported that they were single, 1 (6.7%) reported that she was in a committed relationship, 8 (53.5%) were married, 1 (6.7%) was divorced, and 1 (6.7%) was widowed. When asked to report their employment status, the majority worked full-time jobs (53.3%), 6 were unemployed (40%), and 1 worked part-time (6.7%).

It is important to reiterate that participants' BMI was not collected at the time of qualitative data collection. Therefore, there is a time gap between Bt20's most recent data on BMI and the time of the interviews. Table 4 shows the average age of participants at the time of the interview and the average age of participants at the time of BMI data collection, stratified by participant type. Further, it shows the average age differential, or time gap, between the age of participants at the time of the interview and time of BMI data collection, also stratified by participant type. The average age differential for young adults was 1.4 years (sd = 0.53), and the average age differential for mothers was 1.8 years (sd = 0.53).

Table 4

Participant Age at Interview and BMI Data Collection

	Young Adults	Mothers
Age at Interview (years)	24.2 (SD = 0.04)	53 (SD = 4.9)
Age at BMI Measurement (years)	22.7 (SD = 0.53)	51.2 (SD = 4.8)
Measurement/Age Differential (years)	1.4 (SD = 0.53)	1.8 (SD = 0.53)

Eating and Physical Activity among Young Adults

This section seeks to describe and characterize how the young adult participants typically eat and exercise, and related decision making processes. Additionally, it will

provide more context around the knowledge, attitudes, and motivations around eating and physical activity.

Food Behaviors, Knowledge, and Perceptions.

Food behaviors varied greatly throughout the young adult participants. They all eat some combination of traditional South African food at home, pre-made "junk" in their neighborhoods, and more westernized take-aways. Traditional South African food might include pap, meat, rice, chicken, bread, chicken and dumpling, mince, porridge, Boerewors (a type of sausage), and a selection of vegetables. Traditional food tends to be fried with either fish oil or sunflower oil. Junk food sold around the neighborhoods almost always include kotas, bunny chow, fat cakes, fried chips, and sometimes liver, chicken feet, animal intestines, and fried fish. Popular take-aways include KFC, McDonalds, Chicken Licken, Steers, and pizza places. While some young adults eat veggies in some form every day, veggies are typically prepared and eaten on Sundays when full meals are cooked. The young adults tend to snack throughout the day, and favorites include crisps, sweets, chocolates, and sometimes fruit. Some of the young adults are one of the primary cooks in their house, particularly if they are unemployed. Others will come home and eat what their sisters or mother cooks after work. Some of the participants' households eat primarily fried food and food that is fried with salt and spices, and some primarily eat boiled or cooked food. The majority of participants who leave the house for work will pack a lunch box of the previous day's leftovers, and order take-aways on Fridays and periodically throughout the week.

One of the most reported "healthy" food behaviors among young adults in relation to eating are small portion sizes at meals and smaller amounts of food throughout the day.

Most of the participants prefer to eat smaller or normal size meals, and have never really enjoyed eating big portions of food at any given time. This behavior was supported by discussions with the young adults' mothers. The majority of mothers said that their daughters generally don't eat that much. Despite the fact that young adult participants eat junk, take-aways, and fried and starchy foods at home to varying degrees, they almost all prefer to eat small amounts or regular size portions. Table 5 shows quotes from three young adults and their mothers talking about the amount of food they tend to eat.

Table 5

Quotes about Portion Sizes from Daughters and their Mothers

Daughter/Mother Pairs	Quote from Daughter	Quote from Mother
Nunu and Beauty	I: Why don't you eat a lot? Nunu: I don't know (laughs). I just get full easy. So it's either mid-size or small. But I don't eat a lot lot.	She doesn't eat a lot…Eats small amount because she doesn't want to pick up weight. She has always eaten small amounts of food, yes.
Hope and Thato	She gives my dad a whole lot. But my sister and I don't like eating a lot at night so it'll be just two spoons of rice, for instance, and one spoon of meat, and on a Sunday, it would be vegetables.	She doesn't eat a lot and she doesn't eat junk food.
Superntha and Lucia	Mostly my dad has to get a bigger plate (laughs). So yeah, it's a bigger one for my dad. The one that comes after that for my mom, and then for us, the sisters, it will be maybe medium plate. Then smaller size for the children.	Yes, you know she's not a heavy eater…But at least she's having a manner of eating. Yes, and she's respecting the food.

Even though the majority of participants ate small amounts of food, one participant did not prefer to eat small portion sizes at meals. According to Lizzy, "I don't like eating in small portions, it's just a waste of time (laughs). When I eat, I just eat… I just want to eat once, get it done." Further, Buhle said that she never thought about the

size of foods she or others ate until she was recently diagnosed with a condition that affects her digestive system and forced her to change her diet two months prior to the time of data collection. However, she doesn't think that people in Soweto pay attention to portion sizes:

> I don't think that most people [in Soweto] pay attention to portion sizes. It's, more of, a white term. Like I, I think it's more related to white people. Portion control…I think white people care more about portion control because they have more knowledge on what's healthy, they eat a bit more healthy, they have more access to what is healthy and what is not, and once you have access to what is healthy or not that just means you have more access to more money, which unfortunately... I'm just being honest, I think... I think they [people in Soweto] do [get education about health]. But there's so many other things that are on their mind that I don't think it's a priority to them.

It was very common for participants to define healthy eating as eating veggies, fruits, and drinking water. Other common definitions of healthy eating were eating small portions, boiling food instead of frying, not eating a lot of foods with oil, whole wheat and fibrous foods, cereals, not eating a lot of take-aways, and eating three balanced meals a day. Interestingly, some of the participants said that cooking without a lot of spices was also considered healthy. Further, three participants noted that foods that are not expired are also considered healthy. One participant said not drinking a lot of cold drinks is also considered healthy.

Many of the participants generally think that eating healthy is important and essential for good health and living long, but that does not necessarily translate into how they perceive their own individual need to eat healthy or their eating behaviors. These young adults do not perceive themselves as health conscious, and only think they eat healthy sometimes (but not really on purpose). When asked to describe healthy eating,

Nthabiseng said, “Yeah, exercising, being aware of what you’re eating. Being informed, as well, I think you need too. And caring; because it’s one thing to be informed but if you’re not bothered, it won’t make a difference, I think.”

Many of the participants do not view healthy eating and health as a priority at this point in their life, despite what they may know about the benefits of healthy eating. For instance, when talking about healthy eating, Bontle says that she never thinks about healthy eating.

> I think if you really have to, then you should eat healthy foods, you know? When I get the chance, honestly, I do eat healthy but I don't even think about healthy eating. It's standard for all. It's there. It's not that I do not have the knowledge about healthy eating. It's there, I know I should eat healthy but yeah, I'll do it sometime in life…I'll deal with whatever repercussions of eating junk now later in life, whenever – if I have to anyway.

Some participants feel that since they don’t gain weight, they don’t need to bother with healthy eating. According to Nunu, “I eat like, not so healthy stuff and then I don’t gain weight. So that’s maybe why I’m not concerned. Even though I know, maybe inside it damages me, even though my weight is not showing but, yeah. Cuz I’m not gaining weight so I don’t get worried.”

There are some participants who think it is important to make the effort to eat healthy, and either try to make the effort or want to try. Some participants mentioned that their skin complexion is a motivator for eating healthy. Lala notices the amount of unhealthy food she eats when her skin changes: “It [her skin] becomes more oily and pimples…But I can just, okay I’ve been eating like sweets and anything like take-aways and I can see the pimples okay, I just have to lower down everything.” Others think that the way their body feels makes them want to eat healthy. Participants mention wanting to

eat healthy if their body feels tired, hungry, bloated, and heavy. Further, they are motivated to eat healthy to prevent getting sick and a desire to look and feel healthy.

Physical Activity Behaviors, Knowledge, and Perceptions.

The majority of participants were not intentionally exercising around the time of the interviews, but most had been regularly active in the past or have tried exercising before, especially during school. Many of the participants talked about playing sports in primary and high school, including netball, athletics, hockey, and tennis, and some of them defined themselves as athletes during school. Further, one of the key differences in exercise habits between childhood and current exercise is that when participants were growing up, it was normal for them to be running around and playing, and they had more time to be physical active in high school. Now, it is not appropriate for them to go and play, and many of them spend the day sitting down if they are employed. For instance, according to Tozi, "When I was growing up, everything I did was exercising. Playing the hoops, doing whatever. I was just outside running around. It was exercise, but now I don't exercise because I wake up at 5:00, go to work. Sit the whole day. 4:00, I'm at home." Other participants may have tried exercising, like attending the gym or going for a jog, but it generally lasted less than a month.

Even though most of the participants do not engage in regular and intentional physical activity, many of them recognize that they do get unintentional exercise throughout the day.[2] Unintentional exercise primarily comes in the form of cleaning, taking care of the house and yard, and walking to do errands. Cleaning is how Sewela gets exercise every day because "when you do something [cleaning], it is exercise. It

[2] Only one participant, Anne, used the term "unintentional exercise", but it is being used here to capture all of the discussions around getting exercise in their daily routine

takes movements and you sweat when you do [it].” Also, Lebohang does not go to the gym, but prefers cleaning at home: “Yeah, I’m lazy going to the gym. I’d rather be at home and clean. That’s how I exercise at home, I clean.” Many of the participants describe themselves as lazy to exercise, which is why they do not engage in physical activity.

Another form of exercise that participants reported was transportation methods. Predominant modes of transportation included taxi (n = 10), walking (n = 5), driving themselves (n = 4), being driven by others (n = 2), train (n = 2), and bus (n = 1)[3]. Public transportation was sometimes associated with exercise, because you still have to walk to get to the taxi rank or the station. For instance, Lizzy noted, “I’m using public transport. In South Africa, like it or not, you are going to walk…That’s what’s good about South Africa, exercising is like – it comes automatically.” And according to Chelly, “it's not like you just get in a taxi, right in front of your doorstep, no. You just walk.”

Three participants were still regularly exercising by the age of 24, and each were doing something unique from one another. Superntha is unemployed, and spends a lot of time walking to internet cafes to search for jobs and to the mall to buy food for the house. She intentionally takes long walks for exercise about 2-5 times a week, and jogs for about 20 minutes 1-2 times a week. She will also exercise when she is at friend’s house, which consists of push-ups, crunches, sit-ups, weights (“lifters”), and jump rope. Chelly works and goes to school part-time, and is an avid soccer player. She has been playing soccer for as long as she can remember, and plays and trains whenever she gets the chance. Bonginkosi is employed full-time, and goes to the gym at her work place before work

[3] Total does not equal 17 because participants talked about more than one main form of transportation, different modes of transportation depending on where they are going, and change over time.

begins. She tries to go every morning for one hour. She did not go to the gym before she started her current job, but she used to walk up and down 10 flights of stairs at her previous job. Bonginkosi also played netball in high school.

All young adults were able to provide some examples of what they considered to be exercise, and they generally consisted of types of sports, intentional exercise activities, everyday activities, and household chores. Commons sports considered to be exercise were netball, soccer, aerobics, volleyball, swimming, and tennis. Intentional activities included jogging, running, going for a walk, "gymming", and a variety of calisthenics. Everyday activities could be "anything", walking up a flight of stairs, walking instead of taking a taxi, childhood games, and your own movements. Household chores were also perceived to be exercise by the young adults, such as cleaning, the dishes, the wash, and washing the floors.

Most of the participants grew up playing sports or games of some sort, and generally stopped after primary or high school for a few reasons. The young adults stopped playing sports and exercising because they got "lazy", were growing up, couldn't find a team to play on in their communities, didn't have the time, or got interested in other things. Interestingly, about a quarter of the participants mentioned that they have either looked for a netball team to play on and can't find one, or that if they could find one, they would still want to play. Some mentioned the idea of starting their own netball teams. Many found that the time between school and adulthood was a difficult time for girls to be regularly physically active.

Other than playing sports growing up, participants talk about a variety of motivators they have to exercise, however they personally defined exercise. In particular,

the young adults want to look good, make their bodies feel less tired, be happy with their weight, be fit, relieve life stresses and boredom, have energy and feel light, and balance out their lifestyle. According to Lerato, "I think you should exercise every day. Cuz if you don't exercise, man, your body gets tired, you end up being lazy… After exercise you feel fresh, you know."

Decision Making Processes and Facilitators to Healthy Behaviors

Throughout the interviews, participants discussed how they made certain decisions around food and physical activity, and how they overcome barriers to healthy eating and physical activity. Moreover, participants reported the decision making processes and facilitators to healthy eating and physical activity.

Table 6 provides an overview of some of the ways that participants decide how to eat and strategies that help them eat healthy. While some of these approaches were less common throughout all of the young adults compared to others, "Portion Control and Management", "Balance and Alteration", and "Controlling Food Behaviors/Access" were most frequently mentioned as approaches to healthy eating decision making.

When participants use "Portion Control and Management", they eat and enjoy the junk food that is prevalent throughout Soweto; however, they try not to eat the whole portion, only eat junk periodically, eat smaller meals when they are not as hungry, and try to reduce unhealthy foods from their diet steadily as opposed to all at once. When talking about how she limits what she eats as opposed to dieting, Lala said, "Normally like let me just say, if I have like your chips, your normal fried chips, I'll order them but I know I'll share with someone. So me sharing it's like I didn't eat it like, the whole thing." Even if Dimakatso eats fried chips or other junk, she tells herself, "I'm not gonna eat the whole

portion of this. Gonna eat [how much] I want, then I'm gonna be okay." She further rationalizes, "And if I eat fried chips today I'm not gonna eat it tomorrow. Maybe once a week. It's fine." As Nthabiseng was talking about the sizes of meals she likes to eat, she noted, "I don't like eating more than – when I feel like I'm full, I'll stop eating whether there's still food or not."

Table 6

Eating and Food Decision Making Processes and Facilitators

Theme	Description
Portion Control and Management	· Eat less of the unhealthy things - enough to satisfy cravings · Reduce certain foods bit by bit instead of all at once · Eat smaller meals or not eating at all when not as hungry · Small portions · Eat junk periodically · Drink water to avoid overeating
Balance and Alternation	· "Typical Soweto food" with fruit, water, vegetables · Always have fruits and vegetables at the house · Choose healthier alternatives to snacks and sides at take-aways · Avoid over-oily foods
Controlling Food Behaviors/Access	· Have a budget · Leave money at home so she doesn't spend on junk at work · Shopping lists · Have a routine · Consciously tell self to stop eating · Stops eating for long periods of time without fully starving self
Cooking	· Cook with whatever is in the house · Have everything available in the house to cook · Cook whatever they want to at the time of cooking · Asks mother what to cook for the family
Other	· Chooses what foods to eat by understanding how different types of food and eating patterns affect her own body physically and mentally · When funds are limited, think about the future so she doesn't spend carelessly on food · Decides to prepare and fast when she is longing for something · Curiosity about how not eating meat and preparing vegetables certain ways would affect her and did a 21 day fast

Participants also use "Balance and Alternation" to help make healthy eating choices. Beyond the amount of food, some participants try to balance unhealthy food in

Soweto with water, fruit, and vegetables, and try to pick healthier alternatives to certain snacks. When talking to Superntha about whether she thinks she eats like the rest of the people in her neighborhood, she said, "Mostly I do. But at least I know something that, even if I eat bad I have to be drinking lots of water. And at least put some fruit in my diet. And a lot of vegetables. So yeah, that's what I do just to at least keep a balance." When discussing her perceptions about how healthy she eats, Bonginkosi admitted, "I don't always get it right. But I'll try. Like if I have burger for lunch and chips, I'll try to have fruits. I know it doesn't really balance it. But I'll try at least. Or if I snack, I try not to eat crisps and stuff. Popcorn is a healthy alternative to that."

Young adults also described a number of "Controlling Food Behaviors" that impacted their access to food in some capacity. For instance, participants leave money at home when they go to work so they don't buy unhealthy foods. Also, families make budgets and plans to help ensure that there is food in the house, despite the increasing cost of food in Soweto. When describing how Lala and her family overcome rising food costs, Lala explained, "We normally have a budget. If we exceed the budget, if you want something more you rather go to your Cash n Carry's [instead of the grocery store]. Where you buy things in bulk."

Participants also discussed how they decide to exercise and ways to overcome barriers to physical activity. Table 7 describes how participants decide to be active. Some participants feel like taking a walk when their body feels tired, like Lerato: "Cuz if I didn't take a walk maybe to the mall, my body gets tired." As discussed before, participants make small behavior changes to incorporate exercise into their day, such as choosing to walk instead of taking a taxi. Sometimes, participants are encouraged by

friends or co-workers to start going to the gym, but admittedly stop going after a while because they didn't feel like it was their decision in the first place, or they did not see why they needed to go. When asked to explain why she started to go to the gym, Lizzy said, "I think its peer pressure, because my friend was starting the gym. For moral support or something. It was so stupid. It wasn't my decision anyway. It wasn't something that I needed to do."

Table 7

Physical Activity Decision Making Processes and Facilitators

Theme	Description

Individual	· Jog or walk to alleviate feeling down or tired
	· Small behavior changes to incorporate exercise
	  · Choose to walk instead of taxi
	  · Take the stairs instead of a lift
	· Have a routine
	· Influenced by friends or co-workers, but stop going
	· Gym at work, and already has to get to work early in the morning

At the House	· Have to be active and helpful and doing things around the house · Walk to the store to replenish something missing at the house · Help family member recover from health issues or to get more healthy · Workout with husband because both were gaining weight
Safety[4]	· Walk and jog with a friend or in a group · Avoid traffic by jogging in the streets early or later (after morning rush) · Tells someone she is close with where she is and where she is going

Almost all of the participants decide to be active at home because they have a responsibility to take care of the house and contribute. For instance, Tozi said, "I don't just let my mom do everything for me like my son's laundry, my laundry. I try to do most of the things for myself. So, that's what keeps me busy at home." A number of participants talked about brief periods of exercise due to the fact that they decided to help

[4] For more on ways that participants recommend overcoming issues related to safety in their areas, see Appendix 5.

a family member with a health issue. After her mom had a stroke, Superntha helped her mom with occupational types of exercises. Anne's mom needed to lose weight for health reasons, and Anne used to jog around the block with her mom to help her get healthy.

Safety has been previously identified as a barrier to regular physical activity in Soweto. Some of the ways in which the young adult participants overcome that barrier include walking and jogging with a friend or in a group. Additionally, it is important not to walk or jog outside at the same time every day, or go to the gym in order to get exercise. According to Nunu,

> During the day you can't walk cuz it's too hot. You have to walk in the morning or at night. And it's not safe if she's just walking alone. So, she needs to go to the gym where she will just gym normally. Cuz if she walks around it's not safe. Especially if they will see her every day, then they'll say 'Oh, that's when she walks around, 6 o'clock in the morning.' Then those people will, rob people they will go and do something to her.

Another way to stay safe is to avoid high traffic times of the morning. When reflecting on how she stays safe when she goes for a jog, Superntha mentioned, "[I stay safe] by waking up early or maybe going there [on the street] later when I see that there's no much traffic outside…cuz I'm very scared of cars." Further, one participant lets someone know where she is, where she is going, and what she is doing when walking at night.

It is equally as important to discuss the fact that some participants did not think they made conscious decisions about their eating patterns, and more often than not just eat whatever they feel like. For example, Lala said, "Like I don't choose from like, me eating junk food I just eat whatever I like to eat like." Additionally, Chelly does not think about the food she is eating, and rather lets her body tell her what to eat. While some participants were able to identify decisions around food and physical activity, some

believed they didn't have a decision making process around health behaviors because they don't necessarily gain weight or they don't consider themselves to be health conscious.

Health Perceptions among Young Adults within Soweto, South Africa

Young adults were able to list a wide variety of effects or consequences of being unhealthy or having too much body fat. The three most common types of outcomes were heart problems and cardiovascular complications, issues related to pain and physiological functioning, and higher exposure to illnesses and sicknesses[5]. Heart problems and complications included strokes, heart attacks, cholesterol, clogged arteries, high blood (high blood pressure), and obesity. When thinking about the effects of having too much body fat, Nunu said, "Like your health. If you have too much body fat, I don't know. Maybe you'll have problems breathing, or cholesterol, or heart problems. Yeah maybe when you walk you get tired easily." Pain and physiological dysfunction involved difficulty breathing and becoming easily tired, oily and pimply skin, weight problems, headaches, back pains, and upset stomach. People who are unhealthy get sick more often, are exposed to viruses, and have to go to the doctor more than healthy people. There is also a general consensus that unhealthy people live shorter lives than healthy people. Less commonly discussed effects of being unhealthy included self-esteem, being unattractive, and eating disorders.

When asked to talk about what it means for someone to be healthy, most people mentioned someone who exercises, eats well, and looks out/takes care of themselves. This could mean that a person doesn't eat food that harms their health, they eat balanced

[5] The terms "cardiovascular complications" and "physiological functioning" were not used by the participants, but are used here to categorize types of health outcomes that participants discussed.

meals, have a balanced lifestyle, and are aware of what they eat. To be healthy, it is also important that a person watches their weight and is fit, which means that they should not be overweight or underweight. However, some women naturally have big bones and are just bigger in general. According to Lebohang, "Sometimes it is not healthy to be that big. Sometimes it is the way your bone is structured…Sometimes it is okay [to be overweight]. Maybe she comes from a big-boned family or something like that." Less salient perceptions of a healthy person included someone who is clean and lives in a clean place with clean air, doesn't smoke, has strong bones, a healthy heart, and does not have chronic illnesses. Some participants mentioned aspects of mental health as a part of being healthy, including trying to always be happy, being positive about everything, and living stress free.

There were a number of general perceptions that participants discussed about health and living a healthy lifestyle within the context of Soweto, South Africa. A few participants mentioned that there are different ways that people can be healthy, and it doesn't just have to be eating healthy. If people are active but eat unhealthy foods, they can still be healthy. To illustrate, Bonginkosi reflected,

> I suppose it's necessary to be healthy as a person but I think there's different ways you can be healthy, but obviously food, very important that you eat healthy. But I think that if you exercise as well or there are other forms of being healthy then that's why, I don't necessarily have to focus on food…I think your lifestyle in general [is another way to be healthy instead of eating healthy] because drinking water, there are some people who drink cold drink throughout the day and not enough water. The stress levels as well. I suppose when you're really stressed you become sick and cannot be very healthy. Smoking I think is a very bad habit. Excessive drinking also leads to weight gain and stress.

Additionally, Lala noted, "Even though I might not eat healthy, there is a difference between a person who eats healthy and a person who doesn't eat healthy. But sometimes

if you are clean and a tidy person you do look like a person who eats healthy." Even though it is difficult to be healthy in Soweto, some participants thought that some women are able to be healthy because everyone's systems and metabolisms are not the same. Lizzy said, "Our systems are not the same. Our metabolisms are not the same. And our mindsets, even though we still live in Soweto…if we had one mind and we were all one, the world would be different. So we are different in some ways." Another explanation as to why some women are able to be healthy in Soweto is because they have had adverse experiences with health (i.e. either personally or a relative had a stroke) or have struggled with things like acne or their weight. These experiences serve as a motivation to try to be more health conscious than normal. For instance, Lizzy described,

> I think if somebody eats healthy in Soweto, it's somebody who had a – I wouldn't say a bad experience about health or something like that. Say for instance if maybe somebody were to see somebody die of diabetes, then you're forced to eat healthy because you don't want to go through that route…So it's an experience that will make you eat healthy in Soweto.

Tozi also explained similar thoughts. When talking about how people typically eat in Soweto, she said,

> [We eat] not so healthy. We just don't like at what we eat. We eat a lot of oily food. And most of the time we don't eat – sometimes we find that the whole week will pass and we didn't even have an apple or orange. Yes, we have a lot of junk food…Once you start getting ill, that's when you start noticing, 'No, I have to eat well. What shall I eat?' Yes, otherwise, no we just eat whatever we eat.

An additional reason why some women are able to be healthy is that they have the money and the access to live a healthy lifestyle. When talking about how some women can maintain a healthy body weight and others cannot, Lerato suggested,

> Cuz others can afford, others can't…The ones that can afford, they're the ones that go to the Virgin Active gyms, you know. They can afford to pay that…The ones that can't afford, ah, they care less, we eat anything.

Finally, a few participants proposed that people who grow up or work in ethnically diverse areas (i.e. suburbs) may be exposed to and learn about different things that may help them with being more health conscious compared to Soweto.

Despite all of the knowledge that the young adults had about health, most seemed to think that health is not a priority for people in Soweto, and that being healthy is not realistic for a lot of people. For example, when reflecting on Soweto in general, Lizzy said, "Health is not really our issue. From when we were still young, it wasn't something that was an issue… So I think everybody in Soweto thinks like me… Health was never an issue from birth."

Body Size and Weight among Young Adults in Soweto, South Africa

When it came to how participants perceived the ideal body weight and size of women their age in Soweto, the general consensus was that girls don't want to be too fat, they don't want to be too thin, and they should look and be physically fit regardless of their size. Further, there are certain physical features that a lot of girls prefer. According to Lala, "Most of the time it's like, okay I don't care if I have a big bum or thighs, I just want a flat tummy." Additionally, according to Hope, "Meat in the right areas is what they say… Basically they want big thighs and a big butt." A number of participants discussed that all women are different and some women naturally have bigger bones and bodies and thicker skin from birth, which is acceptable. However, it is not okay if a girl in her early twenties has always been thin and then all of a sudden gains weight.

Participants often used clothing sizes to express what they considered to be an ideal body size, and answers ranged from size 28-36 (approximately sizes 0-12 in the United States); however, the most agreed upon sizes for an ideal body size were 30-34 (approximately sizes 2-10 in the United States). Many participants felt that as long as someone is comfortable and happy with their body and loves themselves, that is more important than what may be considered an ideal body size. For instance, Chelly said, "I always had a philosophy saying, as long as you feel good in yourself, that's the best way cuz no matter what somebody else can tell you, it's only you."

Many of the participants noted that the ideal body size for young women in Soweto tends to be based on what men find attractive, or what young women think that men find attractive. For instance, Hope said, "The ideal [body size] in [Soweto] is based mainly around guys and what girls think they should look like for guys." Additionally, Bontle mentioned, "And you know if a guy, if a majority of guys like a certain body shape, then it's automatically what every girl aspires to be like."

Some of the participants talked about body weight and body size as an indicator for age and maturity. In particular, a bigger body shows people that you are older and grown up. Even though most participants agree that girls don't want to get too big too early, Lebo mentioned that, "sometimes you have to show that you are a mom, you have to show that you are a wife…You cannot be a size 28 forever if you are growing, that's maturity. It is not like getting fat but it is just growing up." Nthabiseng warned that,

> Well the average girl from Soweto is obviously surrounded by those, the fast foods and stuff; and just the nature of the women in our families; we need to almost be more cautious than your average girl because you don't want to get there too soon. The other women are big, big bums, and that's fine because I think you eventually get there but we need to be more cautious now because the things you eat, to not get there faster than you

> should. Or actually not get there at all. So I think you need to be far more cautious than they used to be in the past because of the food around us and what were exposed to.

Participants also discussed discrimination related to body weight in their neighborhoods. Superntha offered,

> I think sometimes in our society, most people are judged by their appearance…And then you find others that are maybe, a bit bigger sized. And, they get discriminated against. Like, 'No, no, she's too fat. We don't go around hanging out with fat people. Fat people don't bathe, they stink.' That whole mentality out there [in the neighborhood] that's not positive about those people… It's like a wrong thing when you are thick skinned.

On the other hand, some of the participants recalled negative interactions with individuals who are bigger than them, and one person mentioned that she has experienced discrimination for being too skinny.

A few of the young adult participants noticed that they have seen changes in girls' body sizes in Soweto as they have gotten older. When talking about weight management in Soweto, Buhle reflected,

> I think the problem with that is because we eat so much junk food because we can't afford to eat the proper food that, it just seems, seems normal now. It seems normal. You have a woman with a gut now it's like, ah, well, you know that's just contributed to her eating magwenya [fat cakes] in the morning, then kota and milli, then having cow intestines in the afternoon. It's you know just, a by-product of just the society that we live in.

Additionally, Lebo noted that she has seen an increase of people with eating disorders and people not caring if they get fat. Anne also observed weight management behaviors among girls in Soweto: "But I can say that most of us, most of them do worry about their weight. Hence they go on diets and they do the things they do. But most of it isn't really healthy. So it doesn't really count as healthy, going on a diet." Even though they didn't

describe weight management as the main motivation, two of the participants reported personal eating patterns that could be considered unhealthy and extreme, which may be partially influenced by their weight. Others discussed healthy behaviors in order to lose weight, primarily going to the gym and exercising as opposed to eating healthy foods.

Overall, there were three types of body satisfaction among the young adults, with an approximately equal number of participants in each type. There was not one type that was more salient than the others. These types include "feeling good," not completely happy, and not an issue. A number of participants felt happy with their weight and were comfortable with their body size. Other participants felt mostly comfortable with their bodies, but thought they were gaining weight and needed to lose it. Finally, some participants never had an issue with their body size, and having a normal weight was so natural to them that they don't even think about weight or worry about it. Table 8 details some of the characteristics of participant's body satisfaction types.

Table 8

Types of Body Satisfaction among Young Adults

Type of Body Satisfaction	Characteristics
Feeling Good	· Loves her weight, happy with her weight as it is, doesn't want to get any bigger or smaller, comfortable with her size · Feels confident about her body despite how people think about her and treat her · Concept of acceptance and the need to be happy and complete · At the end of the day, it's her body and she can do with it what she wants · Was previously too big or too skinny and subsequently lost/gained weight, and now they are happy
Not Completely Happy	· Comfortable but not that comfortable – neither satisfied or dissatisfied · Thinks her belly is too big · Feels like she's gaining weight now and needs to go back to her normal size – wants to look and feel her age
Not an Issue	· A healthy and normal weight comes natural

	· Doesn't make an effort to maintain weight because she either never gains weight or loses and gains weight normally · Not concerned about what she eats or exercising because she isn't overweight and doesn't gain weight · Doesn't worry or think about weight · "It's how I was designed to be"

Mother and Daughter Comparison

This section highlights some of the main similarities and differences between daughters and mothers across major themes. Table 9 includes quotes from mothers and daughters to support results from each theme.

In general, mothers agree with daughters about foods that are considered healthy, which includes how foods are prepared. They also agree that eating healthy is a major part of a healthy lifestyle. For some this translates into their eating habits, and others it does not. However, mothers in general tend to think about the health of their diets more than daughters. Further, many of them have had to change their diets to accommodate either personal health concerns or of family members. Some of the young adults agree that mothers think more about healthy eating than young people do because they are older and need to eat healthy to live longer. For instance, Anne described her mother, Tammy,

> Yo, my mom is a health freak. She's like, she doesn't eat you normal fish oil thingies. She's into your olive oils. The butter she buys is the one that says your heart will be healthy or something. The chicken she buys has no skin. I think it [her mom being a health freak] goes back to that age thing. She's getting older, she wants to be healthier, she wants to live longer. And I think we'll only realize that once we get older.

Mothers and daughters who exercised had similar reasons as to why they do it, such as wanting their body to feel better and to help with their weight. However, mothers who reported that they exercised were more likely to begin exercising as a result of a health issue. For example, Nozuko relayed this story,

> Exercise is very important. I give an example. My daughter used to battle with me high blood pressure. My parents had it. It runs in the family. And because I am spiritual, I believe God can heal everything. My BPs always high because I always live with peoples' problems. The doctor says to me, "You know I can't bring down your blood pressure. I don't know what to do anymore. Do you exercise?" And guess what, we do have a gym and I hardly went. In January, I said to myself, "This year I'm going to go to gym at least 3 times a week." I'm blessed because I live up here now, I can always make time to go to gym before I go to the office. I don't like to go early in the evenings – full – there's always young people. So from January I started to go to gym 3 times a week. End of January, I went to the doctor and he was shocked. It was gone. So exercise works.

Similarly, mothers and daughters who did not exercise knew the benefits of exercise, but either consider themselves lazy or face barriers to exercise.

Daughters and mothers had similar views on the consequences of being unhealthy and what it means for someone to be healthy. They both expressed issues related to cardiovascular disease, physiological functioning, and sicknesses. Some of the young adults posited that people who have had some adverse experience related to health are more likely to be health conscious and to eat healthy (see page 39). This thought was supported by a number of the mother's personal experiences. For instance, Lucia (mother) explained,

> I feel healthy, very healthy and I think the healthy food keep you strong and keep you healthy. Because if it wasn't through healthy food, I maybe wasn't going to survive the mild stroke that I have. I'm looking very, very much on my health so that I can live longer.

Daughters and mothers tend to have similar views about women's body size and weight. Both groups think that a woman must not be too thin or too fat, and that there can be negative health consequences for being too skinny or having too much body fat. Further, a woman's weight can be an indicator to others about her age and her life experience. However, there is a contrast between daughters and mothers definition of the ideal body size for women in their age group. Young adults prefer to be around sizes 30-

34 (approximately sizes 2-10 in the US), whereas mothers prefers to be around size 38-40 (approximately sizes 14-18 in the United States).

Table 9

Similarities Across Daughters and Mothers

Major Theme	Daughters	Mothers
Food and Eating	· Lerato: "It is a good thing [to eat healthy]. Cuz I think there's some preventing like your, being cold at the viruses, you be sick like regularly. Things like that so, that's how I think about eating healthy." · Bontle: "It's not like I'm incapable of eating healthy foods…I think if you really have to, then you should eat healthy foods, you know?...It's not that I don't have the knowledge about healthy eating. It's there, I know I should eat healthy but yeah, I'll do it sometime in life."	· Smangele: "Healthy eating is important and very good. When it comes to healthy, when it comes to weight, when it comes to the whole body. To eat healthy is very, very good." · Beauty: "Food, I like oil. And that is not healthy. Salt, spices, see? I know that is not healthy but every time when I cook, I put those things."
Physical Activity	· Superntha: "I think [what motivates me to exercise], it's mostly when I feel like I'm tired, you know? That's the thing that motivates me. Or when maybe I need to re-group. Or maybe I need some peace and quiet, maybe some me time." · Nunu: "Yeah, it's a good thing [exercise]. I guess, also to keep healthy. Cuz some people that are exercising, you'll see that they grow up they become older, but they are still fit…So they don't get sick a lot. For me… I don't like exercising. It is a good thing but I don't do it. I don't like it."	· Sybil: "I just feel like I need to go to gym. Sometimes my body tells me when I feel like, been tired, these days I feel so much tired, then I know my body wants to work out. And even having those long, tough days at work, it helps if you go to gym. It relaxes the mind. And for weight as well." · Khosi: "Yes, I would say exercise is good for people who are not lazy like I am."
Health Perceptions	· Bonginkosi: "I think that's [being healthy] actually relative. Healthy for me would be eating properly, three balanced meal and not being	· Nhla Nhla: "Eh, someone to be healthy. It's when you're not complaining of the headache, the fatigue, body aching, yeah…Even high blood, short breath, yeah

	overweight or underweight. Yeah, and keeping fit I suppose. No chronic illnesses or anything." · Anne: "I'd say that it's just to avoid getting sick and having to go to the doctor all the time. And I think healthy people live longer than unhealthy people. There's just a lifestyle thing."	you're healthy. That's my understanding." · Candy: "To me I think it's a good thing to be healthy. You don't want to see the people always get sick. And sometimes sickness, you create yourself. To not eat healthy, don't want to exercise. Important thing is to eat, healthy. So we like to put a lot of fish oil in our food and fish oil is not good."
Ideal Body Size	· Hope: "I just think people should not be overweight. I have a cousin that's overweight, and she struggles, so I think that's the ideal body type; don't be overweight. And don't be too skinny because that does not look healthy." · Lebo: "If I will be size 30 I will be happy with that, because sometimes you have to show that you are a mom, you have to show that you are maybe a wife. You can't be that skinny and what because some, they won't respect you."	· Mokgadi: "The person my age must not be too fat or too thin. Just in the middle. When you look at these people, they big. It's not good because they get different kind of diseases. Easily." · Nono: "They mustn't say, "Oh, look at her," meaning that she never enjoyed her life while she was a child. Dress according to your age. Try to respect yourself so that smaller kids must respect you as well. Even the men outside, they must respect you according to the way you weigh."

Mother and Daughter Relationship

Many of the mothers in this study were motivated to raise their daughters differently than how they were raised, and wanted to provide their daughters with things that they didn't have while growing up. Mothers wanted their daughters to grow up "better" than they did, so they tried to make them happy and provide for them, which may be illustrated in the types of foods the daughters ate. For some mothers, wanting to provide their daughters with things they didn't have while growing up meant buying more take-aways, like for Beauty:

> And specially when I was growing up…we were poor. Then you didn't have that lot of money to go for take-aways and everything, you only come home and eat home…And another thing that is killing us people

> here, because I grow up hard, I didn't want my daughter to grow up like that. Then I will just spend everything, doing everything… When maybe my child was 7, I grow up, I didn't go to McDonald, and my child must go to McDonald every week. That's the thing that is happening.

Beauty continues to reflect on how this pattern will continue in the future:

"…And she's [my daughter] also going to do the same and say you know what, I don't want my children to be like me!" For other mothers, this meant trying to provide healthier foods than the foods they ate growing up, like for Sybil:

> So, that's how I learned [how to eat healthy]. I've taught myself and I've told myself that I will never bring my children up the way I was brought up. There must be a change. There must be a difference…I'm trying to say, my mother, she wouldn't afford all those fancy food. Butter was a luxury to us. A fruit as I've just said, I would even forget that there was an apple on it because my mother wouldn't afford to buy it for us. We would eat pap and acha as a meal when we grew up. But now with my children, it would be a choice to them if they want to eat that.

Almost all mothers discussed that at some point, they have advised and told their daughters what they should be doing in regards to eating and managing their weight. Further, they also tell their daughters that they should always be working around the house as a part of their responsibilities, which many of the participants view as a form of exercise. When talking about her family's views on exercise, Superntha (young adult) laughed and said,

> With my mom, you always have to be doing something around the house…Not just sit down and just do nothing. Yeah she doesn't encourage just sitting, just sitting like that the whole day, no. You have to do something just to keep your body moving.

Now that their daughters are 24 years old and are grown-up, they tend to let their daughters make their own food decisions. Even daughters feel like they have more control over what they eat compared to when they were growing up.

Even though daughters feel like they have more control over what they eat now that they are 24, most of them are still connected with their mother for food, either literally or financially. Many of the young adults who were living with their mothers at the time of the interviews were one of the primary cooks for the house, especially if they were unemployed or only working part time. Therefore, their mothers ate whatever their daughters cooked. However, even if their daughters were one of the primary cooks, mothers buy the majority of the groceries for the family, so whatever the mother decides to buy is what the young adults will use to cook. In addition, in households where young adults were employed, their mothers were generally the primary cook, and their daughters were dependent on what their mother cooked for most meals throughout the day (except when they bought take-aways at work for lunch). When the young adults were employed, they are more than likely contributing to the household finances for food and groceries. In instances where mothers had to change their diet due to health problems or concerns, their daughters only sometimes changed what they ate too.

Interestingly, there seems to be some disconnects across mother and daughter pairs about how they each perceive their relationship with their daughter or mother about health. Table 10 details two themes that illustrate these disconnects. In general, mothers tend to think about their daughter's health more than their daughters do (Priority of Young Adult's Health and Weight). Additionally, mothers perceive a higher level of communication with their daughters about food than what their daughters reported (Communication about Health with Mother/Daughter).

Table 10

Disconnects Between Mothers and Daughters about Health

Theme	Daughters	Mothers
Priority of Young Adult's Health and Weight	1. Only became aware of how horrible food is in Soweto after she got sick recently. "If I wasn't diagnosed I'd still be eating the junk I was eating." 2. Mother encourages her to take a piece of fruit to work every day: "So she does think about my health. It's just that I'm the one who doesn't think about my health."	1. Daughter doesn't want to get fat. She has always been very careful about what she eats and thinks about what she eats to take care of her weight. 2. Is happy that her daughter likes healthy food, and talks to her daughter every day about healthy food. Tells her daughter not to eat more than she already does so she can keep her weight: "otherwise you will get old like me."
Communication about Health with Mother/Daughter	1. Don't talk with family about the foods they eat 2. Physical activity has never been something that her family has had an issue with, so it is never brought up as a topic of conversation. "After five seconds, it will be over, so that is not a topic because you would be out of the topic and speaking about something else."	1. Tells her daughter to respect food and don't just eat anything. Sometimes tells daughter not to eat certain fatty foods, or at least dilute fatty rich foods 2. Daughter goes to the gym every day at work, because everyone at work has to and she wants to keep healthy and juicy.* Daughter tells her that she [her mother] must exercise instead of staying at home, and they quibble about it.

Note. The numbers in each row indicate that the comments are from a daughter/mother pair. Numbering resets for each theme.

* This does not support what her daughter reported as her physical activity behaviors

Surprisingly, mothers were not reported as a primary source of health information by their daughters. When discussing how they learned their interpretation of healthy eating, participants mentioned primary and secondary school (n=7), television (n=4),

other people, including friends, siblings, or grandmother (n=4), clinics (n=3), internet (n=2), the work place (n=1), and the mall (n=1)[6].

Recommendations and Suggestions for Change by Participants

The young adult participants gave theoretical advice to another woman their age on how to start eating healthy and exercising regularly. In addition, participants offered suggestions and other recommendations that would help make their community and lives healthier. These suggestions can be characterized into four general areas: healthy eating, physical activity, individual motivations and mindsets, and society. Appendix 5 details these recommendations and suggestions. It is important to note that even though some of the young adults gave these words of advice and suggestions, some of them felt like they could not because they didn't eat healthy or exercise themselves. Further, some participants admitted that even though they would tell another person to do these things to be healthy, they did not believe they did or would do them themselves.

[6] Total does not equal 17 because participants talked about more than one main source of health information.

Chapter 5: Discussion

Even though all of the young adults had a BMI in the normal range, health was not necessarily a concern or a priority for a number of them. Further, all of the young adults lived within different socio-economic means and had different lived experiences that shaped their development. Some intentionally make healthier lifestyle choices, and some do not. Nevertheless, they still embodied some combination of behaviors and attitudes towards eating, physical activity, body size, and health that helped them maintain a normal BMI, despite living in an obesogenic environment.

Most of the participants eat small portions of food at meals, and alternate fruits and vegetables with unhealthy foods to make their diet more balanced. Some young adults exemplify pre-meditative behaviors, such as trying to have a routine or leaving money at home to prevent buying junk at work. Even though some try to be health conscious, others do not because they think it is not normal and that being obsessed with health will actually be detrimental to one's health. When young adults are motivated by their health, they are encouraged by making their bodies feel and look healthy and light, preventing sicknesses, and improving their skin complexion. It seems that they believe personal health is tied to socio-economic status, but unintentional exercise and other small exercise behaviors (i.e. walking instead of using a taxi, or using the stairs as opposed to a lift) are more feasible for everyone in South Africa.

There are a few key attributes that characterized the relationship between the young adults who had a normal BMI with their mothers who had a BMI in the obese range. Even though young adults may often be a primary cook in their household, their mothers are often the primary person to buy groceries for the family. Mothers wanted to

raise their children with amenities and luxuries that they did not have when they were growing up, and they often instructed and communicated to their daughters about their weight, eating behaviors, or their contribution to the house. However, there are a few disconnects between mothers and daughters related to the relationship they have with each other around health and eating.

The young adults and their mothers discussed a variety of ways to overcome safety as a barrier to physical activity in the Soweto, South African context, which has been documented in the literature (Sedibe, 2014). Some of these strategies include walking with a friend or in a group, alternating walking times and places so people don't notice a pattern, and exercising when it is not dark outside but before it gets too hot.

When trying to promote health in a context that is not particularly health focused, there are a number of approaches to consider that are driven by the data from this study. First, individuals need to be intrinsically motivated and need to understand how changes in health behaviors and perceptions will personally benefit them. As Lizzy said, "you can take a horse to a river, but you can't make it drink." On the other hand, it is important not to promote a culture of obsession with being healthy and thin, which has been seen in other contexts and is not beneficial to overall mental and physical health (Eller, 2014, Neumark-Sztainer, 2005). Body positivity and realism needs to be a priority along with personal and community-level health.

To help accomplish this, there is a need for a mindset change around who should be health conscious and why someone should be health conscious in Soweto, South Africa. There currently seems to be a general perception that a person eats healthy and exercises because they or a loved one has experienced a health-related problem. It would

be beneficial to shift this mindset into a prevention-focused one, one that views a person who eats healthy and exercises does so before there is a health-related problem. Environmental characteristics that promote healthy eating and physical activity are needed to help reshape this general health perception.

Implications for Conceptual Frameworks

This study was guided by an integrated theoretical framework based on the Socio-Ecological Model (SEM) and Social Cognitive Theory (SCT) during the planning phases (Story 2002). After data analysis, it became evident that a combination of SCT and Integrated Behavior Model (IBM) constructs may better explain health behaviors within an SEM framework for this particular study.

SCT constructs that were supported by the data include self-regulation, observational learning, and incentive motivation, and outcome expectations. IBM constructs that were observed in the data include intention or decision to perform the behavior (for some participants), which were influenced by attitude, perceived norms, and less so personal agency. Knowledge and skills to perform the behavior and environmental constraints also contributed to behaviors. Even though these constructs were seen in the data, other constructs in SCT and IBM did not support the findings of this study, such as self- and collective efficacy and salience of the behavior. Therefore, certain constructs within these two behavioral models could inform future research and health communication/promotion activities.

Implications for Health Promotion in Soweto, South Africa

Findings from this qualitative study can be used to inform sustainable and community-based health promotion activities in Soweto, South Africa. Most young adults

reported school, the clinic, and television as primary sources of health information. Other sources included the internet, friends and family, and place of employment. These sources can be used as avenues for future health promotion activities.

Most participants had a fair amount of knowledge on what it meant to eat healthy and exercise. However, many people thought that using spices and herbs while cooking were unhealthy. Unless the spices that are typically used in Soweto are salt-based, this is something that can be addressed through health education. People could actually be encouraged to use spices and herbs to help make boiled or steamed foods less bland, which is a typical perception about "healthy food".

Health education efforts do not necessarily need to focus so much on facts about healthy eating and physical activity, but should help people understand why they should and how they can do it in Soweto. As previously mentioned, people need to have a motivating factor to help them get from the pre-contemplation and contemplation stages to the preparation and action stages (Glanz, 2008). One approach to increase motivation and behavior intention could be to incorporate motivational interviewing techniques into clinic settings or Life Orientation at secondary school. Another could be to develop health communications that integrate the motivations and perceptions of the young adults in this study, such as linking healthy eating and physical activity with helping their body and skin feel better, lighter, younger, and healthier.

In addition to knowledge and motivations, there are implications for skill-based health education. Some skill-based approaches to health education could include how to eat healthy as a family with limited financial resources, how to prepare healthy food that is still tasty and typical of traditional and common South African foods, and how to cook

delicious and appetizing food with healthier oils and less oils. There are a number of cooking shows on television (that the participants mention throughout the interviews) that could relay some of this information to the public. Pre-existing programs that aim to promote healthy eating among children could be adjusted to be more engaging, entertaining, and informed by youth learning theories. Additionally, for families who have to buy all of their groceries one time a month, health education efforts could promote skills around how to buy groceries to last a whole month that are still healthy for the family, including safe storage options. These strategies should be framed in a way that promotes behavior change that does not take a lot of effort, as opposed to placing a burden of effort on the priority population. These skills and behavior changes should feel "normal" within the context of Soweto, South Africa.

In addition to health education and communication efforts that target people on an individual level, there are ways to incorporate health promotion efforts at the organizational and community level. Since mothers and sometimes daughters are buying groceries for the whole family, health promotion efforts at the main groceries may be helpful in encouraging healthy food purchasing. As a result, healthier food may be more readily available at the home for whenever it is time to cook. In addition, it would be valuable to increase opportunities for physical activity post-high school for females, since this is a critical time when physical activity tends to decrease. This pattern is typical in other contexts, so it is important to address this issue to promote lifelong physical activity (Scharff, 1999). A number of participants had trouble finding adult netball teams throughout Soweto, so more netball teams throughout Soweto would be beneficial for females who played in school and wanted to continue playing afterwards. Another

possible intervention could be income-based gym and fitness club memberships to encourage people with less resources to join and exercise. Finally, the Life Orientation curriculum implementation for Grade 12 could be adjusted to support one of its objectives: “long-term engagement in traditional and/or non-traditional sport or playground and/or community and/or indigenous games or relaxation and recreational activities” (Department of Basic Education, 2011). This might include tangible resources for how females and continue to be active, or instilling an intrinsic motivation as to why it is important to continue to be physically active throughout their life. Research indicates that there is room for improvement in the Life Orientation curriculum, so this may be a targeted way to approach improvements (Jacobs, 2011).

Beyond the organizational and community level, there are implications for health promotion at the societal level. There is a need for initiatives that address both the high unemployment rate and the rise of obesity in Soweto simultaneously. A possible avenue for this is for local or national decision makers to support the individuals who sell produce on the streets in order to try and make a living. Having fresh and non-expired produce is of value for women in Soweto, so ensuring that these individuals have access to sell fresh fruits and vegetables would be mutually beneficial. Further, local and national decision makers can support community-based initiatives that aim to promote health. These include repurposing empty space for community-based gardens or park development. However, it is critical that these initiatives are community-driven so that they are sustainable and do not reflect an imposition on personal freedom due to the lived memory of the apartheid government.

Limitations

There are several limitations to this study. First, there was limited time to complete all phases of the study since the study was planned and conducted by a graduate student. There was limited time in-country to collect data and follow-up with participants if needed. Since mothers and daughters generally arrived to the study site together, there may have been limited confidentiality even though the participants were interviewed separately. Although asking participants to arrive together helped with recruitment and participation, the researcher was limited in asking the participant about her mother/daughter knowing that the other person was just outside the room.

In terms of data analysis, almost all of the coding was completed by one coder, which could influence the credibility of the findings. To remedy this, a second researcher who was familiar with the study topics and objectives coded a sub-set of transcripts. The two researchers discussed the coding and any discrepancies that arose. Additionally, the primary coder was the researcher who developed the interview guides, conducted the interviews, and transcribed them, so was very familiar and immersed in the data.

Since all phases of this study occurred over 15 months, was nested in a larger longitudinal study, and spanned international borders, the research priorities and capacity of the researcher and DPHRU shifted and evolved. Ultimately, the researcher aimed to incorporate a maternal and child health approach into a larger socio-contextual framework with the data that was collected in the interviews.

Finally, this qualitative study that took place in Soweto, South Africa was planned and conducted by an American graduate student. Even though the credibility and confirmability of the findings could be impacted, several measures were taken to reduce the potential of an outsider's bias. First, the researcher has an academic background in

anthropology and was professionally trained in qualitative research methods prior to time in-country. Second, the interview guides for both daughters and mothers were semi-structured and open-ended to allow the participant to answer questions in a way that was more representative of her perspective. Third, since the researcher was an outsider, this may have encouraged participants to explain themselves more because there was less assumption that the researcher knew what the participant was talking about. Finally, both interview guides were reviewed by local research staff in Soweto in the form of a focus group discussion and one-on-one meetings with lead research personnel. Despite these steps, there is still the possibility that the data and the interpretation of the findings was influenced by an American perspective.

Future Directions

The methods and results of this study lend itself to a variety of avenues for future research. Many of the participants felt that financial access was linked to health, and provided some explanations as to how socio-economic status was related to health behaviors. More research is needed to understand the role of individual's lived and experienced socio-economic status on personal health behavior in Soweto, South Africa. Research in other contexts suggest that the role of lived socio-economic status is important in predicting perceived health status and body mass index in older adult populations (Padyab, 2014, Wen, 2006). This research would be important for Soweto, South Africa, since many individuals have a lower socio-economic status compared to other parts of the Johannesburg, area.

Similarly, it would be beneficial to understand how food purchasing patterns among families of lower socio-economic status affect them biologically and

psychologically. Many families with lower financial access will typically buy all of the groceries once a month when money is more available. However, this tends to create a food excess/food shortage cycle. More food and higher quality food is more abundant for the first two weeks of the month, and less food and lower quality food is available for the second two weeks of the month. This could have implications for the mental and physical health of families of lower socio-economic status.

The participants in this study (24 years old) may be in a unique period of time in the trajectory of BMI change in Soweto, South Africa. Many participants and their mothers noted that they have gained weight since they were in school, and BMI was measured for the young adults approximately 1.4 years before the interviews were conducted. Since South African culture perceives fuller-figured women as mature and grown-up, some of the findings in this study may not be transferable to South African women of different ages. Further, this study primarily focused on current eating, physical activity, and health behaviors with some exploration into past behaviors and changes over time. More research is needed to explore past health behaviors and attitudes that could have contributed to the participant's current BMI. It may also be helpful to conduct similar research on teenage females to capture protective behaviors and attitudes before leaving high school.

Data collection for this study took place in June-July, 2014, which is during the winter season in Soweto. Therefore, some of the discussions around eating and physical activity behaviors may reflect what they do in the winter time, which could be different in the summer when it is much hotter and different foods are in season. It would be beneficial to conduct similar qualitative research in other seasons to get a well-rounded

picture of food and physical activity behaviors and perceptions among women in Soweto, South Africa.

Finally, there are other qualitative research methods that could further explore the social, cultural, and environmental factors related to food, physical activity, and body weight in Soweto from an insider's perspective. Focus groups with young adults would allow for rich discussion on opinions and perceptions about food and physical activity, and the multi-participant interaction could provide a well-rounded explanation that captures varying perspectives (Hennink, 2011). Further, an inquiry using PhotoVoice would allow participants to take partial ownership of the research methodology and would provide visual depictions of household and community level factors that play a role in individual level health (Catalani, 2010).

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Appendices

Appendix 1: Young Adult Interview Guide

1) Thank you so much for agreeing to talk with me today. My name is Emily Phillips and I am a student from Emory University in the United States. I am a guest researcher working with the Birth to Twenty cohort.

2) This research is being conducted to understand how women in Soweto make healthy eating and physical activity choices, and their attitudes, beliefs, and perceptions around a healthy lifestyle.

3) I am using this study to fulfill my education requirements back home and it will eventually be used to publish.

4) The questions I would like to ask you all relate to where you live, your perceptions about health, food, and physical activity.

5) I want to remind you that all of your responses are completely confidential, and you can chose to not answer any question you want. [REVIEW INFORMATION SHEET]

6) To help protect your identity, I would like to ask if you can provide a fake name that you want me to use after the interview? _____

7) I would like to record this interview so I can better remember everything you have to say. Is that alright? [Sign audio-recording consent form]

8) Throughout the interview, I may take notes down on this paper, but that is only to remind myself of things to ask you later because I do not want to interrupt you.

9) Do you have any question for me? Do you still want to participate in this study? [SIGN INFORMED CONSENT FORM]

Notes to Interviewer:
***Whenever a barrier to healthy eating/physical activity is brought up, ask how they overcome it.**

Introductory Questions

Tell me about yourself…

- Describe normal day
- Family and friends
- How she grew up
- Work, religion, education
- Leisure activities

Can you tell me about where you live?

- Neighborhood, types of living arrangements/houses
- Other people, social support
- proximity to work, schools, church
- Safety
- Who do you live with?

In your opinion, what does it mean for someone to be healthy?

Food

First I would like to talk about food and eating

Tell me about what the food is like here in Soweto…

How would you describe the way people commonly eat in your neighborhood?

- Types of foods
- Food preparation – who normally prepares food and how
- When/where people eat
- Cost

Describe to me what you eat on a normal day…

- Morning, afternoon, evening, snacks, Weekend/weekday,
- How much - portions
- Who normally eats with - family, friends, alone
- What is it like when you eat with friends? Family?
- Setting: At work, church, restaurant, At home/away from home
- Take-aways/Fast Food
- Who prepares the food in your house? How do you decide what to prepare?
- Food preferences/favorite foods

What sorts of things influence your decisions about what to eat?

- Why?

Where do you go to buy food?

How would you describe the places that people can get food?

- Markets, restaurants, tuck shops, grocery stores, corner stores, fast food
- In house kitchens (house shops – cooked food), spaza, garages, kota menu
- Cost, appearance, availability, access, proximity, preference

How easy is it to get food around where you live?

- Why/Why not?

In general, how would you describe healthy eating?

- How did you learn/were taught
- Examples of healthy foods

Do you think you eat this way?

How do you feel about eating healthy?
- Why do you consider it important to eat healthy?
- What is your favorite thing about eating healthy?
- Easy/difficult? What makes it easy/difficult
- What are your biggest challenges? How do you overcome them?

What motivates you to eat healthy?
- Tell me about a time when you felt really motivated to eat something healthy instead of something unhealthy…
- What makes you want to eat healthy?

Have you ever been on a diet?
- Why? What did you do? For how long? How many times?
- Do you think it worked?

How are you able to control what you eat?
Do you feel that you make an effort to maintain your weight?
- Probe on: supplements, western diet, smoking, disorders, etc. as needed

What do you think about fast food?
- Do you eat there? Why or why not?
- How often/week? Weekday/weekend?
- Adverts in your neighborhood of fast foods
- Deals/cost

How do you think the way you eat now is different from when you were growing up?
- How have you adapted to this change?

How do your friends/significant other help you eat healthy?
- What is a typical meal like when you eat with friends? Is it healthy/less healthy than when you eat away from friends?
- How can/do you eat healthy when you are with your friends/significant other?
- Setting: home, school, work, etc, church
- Conversations around food: Do your friends/significant other comment about the food you eat?

How does your family help you eat healthy?
- MOTHER
- What is a typical meal like when you eat with family? Is it healthy/less healthy than when you eat away from family?
- How can/do you eat healthy when you are with your family?
- When you eat from the same plate/Eat from your own plate
- Setting: home, school, work, etc, church
- Conversations around food: Does your family comment about the food you eat?

Physical Activity in a Cultural Context
Now I want to switch over to talk about physical activity

In general, what do you consider to be exercise?

- Types of activities
- Domains of physical activity: recreational, work, transportation
- Sports
- Transportation: How do you travel around Soweto?
- Men vs. Women – thoughts on gender differences in physical activity expectations

Tell me how you are able to be physically active…
- Types of exercise, how often, where
- Support in community – family, friends, neighbors
- Overcoming gender differences in physical activity expectations
- What are your biggest challenges? How do you overcome them?

What sorts of things influence your decisions about if/how you exercise?
- Why?

How would you describe the places that people can be physically active?
- Gyms, fields, parks, sport fields, courts, streets, paths
- Conditions, safety, proximity, access, how many?
- What makes it easy/difficult
- How do you/people overcome barriers

How do you feel about exercising?
- What is important to you about being physically active?
- What is your favorite thing about exercising?
- Tell me about a time when you felt really good about exercising…

What motivates you to be physically active?
- Why?
- Tell me about a time when you felt really motivated to exercise…
- Tell me about a time when you were really motivated to play a sport/game?
- What makes you want to be physically active?

How do you think the way you exercise now is different than when you were growing up?
- How have you found support to keep exercising/training?
- Overcoming Gender differences in physical activity expectations
- How have you adapted to this change?
- School, frequency, where/when, changing challenges
- Westernized ideals of thinness, increasing urbanization

What do you think your friends think about physical activity?
- How do friends help you stay physically active?
- How do you stay active despite what your friends think?
- Conversations about physical activity

What do you think your family thinks about physical activity?
- How does your family help you stay physically active?
- Family/group activities, support
- Conversations about physical activity
- MOTHER

General Health Questions

How would you describe the ideal body type for someone your age?
- What makes you think that?
- Cultural values, tradition, media, peers, family, attention from men

How do you feel about your body size?
- Why is it important for you to keep a healthy weight?

What can you tell me about the effects of having too much body fat?

Concluding Questions
Why do you think some women your age are able to maintain a healthy weight and others are not?

What advice would you give to another woman your age about how to start eating healthy?

What advice would you give to another woman your age about how to start exercising regularly?

Conclusion
Before we end, can you share anything else with me about anything we've discussed? Do you have any questions for me?

Appendix 2: Mother Interview Guide

1) Thank you so much for agreeing to talk with me today. My name is Emily Phillips and I am a student from Emory University in the United States. I am a guest researcher working with the Birth to Twenty cohort.

2) This research is being conducted to understand how women in Soweto make healthy eating and physical activity choices, and their attitudes, beliefs, and perceptions around a healthy lifestyle.

3) I am using this study to fulfill my education requirements back home and it will eventually be used to publish.

4) The questions I would like to ask you all relate to where you live, your perceptions about health, food, and physical activity.

5) I want to remind you that all of your responses are completely confidential, and you can chose to not answer any question you want. [REVIEW INFORMATION SHEET]

6) To help protect your identity, I would like to ask if you can provide a fake name that you want me to use after the interview? _____

7) I would like to record this interview so I can better remember everything you have to say. Is that alright? [Sign audio-recording consent form]

8) Throughout the interview, I may take notes down on this paper, but that is only to remind myself of things to ask you later because I do not want to interrupt you.

9) Do you have any question for me? Do you still want to participate in this study? [SIGN INFORMED CONSENT FORM]

Notes to Interviewer:
***Whenever a barrier to healthy eating/physical activity is brought up, ask how they overcome it.**
Introductory Questions
Tell me about yourself…

- Describe normal day
- Family and friends
- How she grew up
- Work, religion, education
- Leisure activities

Can you tell me about where you live?

- Neighborhood, types of living arrangements/houses
- Other people, social support
- proximity to work, schools, church
- Safety
- Who do you live with?

In your opinion, what does it mean for someone to be healthy?

Food

Tell me about what the food is like here in Soweto…

How would you describe the way people commonly eat in your neighborhood?

- Types of foods
- Food preparation – who normally prepares food and how
- When/where people eat
- Cost

Describe to me what you eat on a normal day…

- Morning, afternoon, evening, snacks, Weekend/weekday,
- How much - portions
- Who normally eats with - family, friends, alone
- What is it like when you eat with friends? Family?
- Food preparation
- Setting: At work, church, restaurant, At home/away from home
- Take-aways/Fast Food
- Who prepares the food in your house? How do you decide what to prepare?
- Food preferences/favorite foods

What sorts of things influence your decisions about what to eat?

- Why?

Where do you go to buy food?

How would you describe the places that people can get food?

- Markets, restaurants, tuck shops, grocery stores, corner stores, fast food
- In house kitchens (house shops – cooked food), spaza, garages, kota menu
- Cost, appearance, availability, access, proximity, preference

How easy is it to get food around where you live?

- Why/Why not?

In general, how would you describe eating healthy?

- Where did you learn/were taught
- Examples of healthy foods

Do you think you eat this way?

How do you feel about eating healthy?

- Why do you consider it important to eat healthy?
- What is your favorite thing about eating healthy?

What do you think about junk food and fast food?

- Do you eat there? Why or why not? How often/week? Weekday/weekend?
- Adverts in your neighborhood of fast foods
- Deals/cost

How do you think the way people think about food/eat now is different than when you were growing up?

- How did people normally eat when you were growing up?
- How have you adapted to this change?
- Westernized diets, ideals of thinness, binging and purging, diet supplements/pills

How do you think your daughter is able to eat healthy on a regular basis?
- What helps her – how does she overcome barriers to healthy eating
- Who/what supports her
- Conversations she has with her daughter about food/eating

Physical Activity

In general, what do you consider to be exercise?
- Types of activities
- Domains of physical activity: recreational, work, transportation
- Sports
- Transportation: How do you travel around Soweto?
- Men vs. Women – thoughts on gender differences in physical activity expectations

How would you describe the places that people can be physically active?
- Gyms, fields, parks, sport fields, courts, streets, paths
- Conditions, safety, proximity, access, how many?

How easy is it for people to be physically active in your area?
- Why/Why not?

What sorts of things influence your decisions about if/how you exercise?
- Why?

How do you feel about exercising?
- What is important to you about being physically active?

How do you think the way people exercise now is different than when you were growing up?
- How did people keep active when you were growing up?
- How have you adapted to this change?
- Westernized ideals of thinness, increasing urbanization

How do you think your daughter is able to be physically active?
- Types of exercise, how often, where
- How does she overcome [barriers – safety and crime, availability of facilities]
- Support in community – family, friends

Perception of Health and Body Image

How would you describe the normal body type for someone your age?
- What makes you think that?
- Cultural values, tradition, media, peers, family, attention from men

How do you feel about your current weight?
- Do you feel that you make an effort to try to lose weight?
- Probe on: supplements, western diet, smoking, disorders, etc as needed
- Have you ever been on a diet?

Relationship with Daughter

According to our records, your daughter has a healthy weight…. How do you think your daughter maintains a healthy weight?
- What do you think she does? Doesn't do?

Can you describe your role in helping your daughter maintain a healthy weight?

- Over the lifespan – birth to present
- Conversations they've had about food, physical activity, weight
- Support, what has she taught her daughter about healthy eating/physical activity

Concluding Questions

What advice would you give to another woman your age about how to start eating healthy?

Similarly, what advice would you give to another woman your age about how to start exercising regularly?

Conclusion

Anything to add? Questions for me? THANKS!

Appendix 3: Demographic Questionnaire

Participant ID#: _____

Interview Date and Time: _____

Interviewer's Name: _____

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1. **Current Age – FOR MOTHER**
    - What is your date of birth? _____ Age: _____

2. **Marital Status**
    - What is your current marital status?

Marital Status	**Tick one**
Single	
Not married and not living together but in a committed relationship/partnership	
Not married but living together	
Married (including traditional or customary)	
Divorced or separated	
Widow/widower	

3. **Occupation Status**
    - Do you currently have a job? **Yes** **No**
    - By job I mean any work done to earn money or to gain skills. This includes casual/informal work and volunteer work.
    - **If Yes:** What do you do for work?

      _____

4. **Highest Level of Education**

- Have you successfully completed grade 12 (passed matric, obtained matric certificate?) **Yes** **No**
- **If No:** What is your highest grade successfully completed?

Grade 5 or lower	Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11

- **If Yes:** Is grade 12 your highest level of education? **Yes** **No**
- **If No:** What is your highest level of education?

Certificate/Diploma	Bachelors' Deg.	Honor's Degree	Master's Degree	Doctorate

5. Maternal Status – FOR YOUNG ADULTS

- Have you ever had a child? **Yes** **No**
- **If Yes:** how many children do you have? _____

6. Home Description

- How would you describe the home you are living in?

Home type	**Tick one**
Shack/Zozo	
Flat/Cottage	
House	
Room/Garage	
Residence (attached to education or employment)	
Hostel	
Other	

Appendix 4: Codebook

Code Tree

1. Introductions/General
2. Neighborhood Characteristics
    - 2.1 Safety
3. Societal/Cultural Perceptions
4. Access
5. Family Relationships/Influence
6. Non-family Relationships/Influence
7. Food/Food Behaviors
    - 7.1 Diet
    - 7.2 Motivation/Feelings
8. Physical Activity/Physical Activity Behaviors
    - 8.1 Transportation
    - 8.2 Motivation/Feelings
9. Body-Image/Body-Size
10. Decision Making/Overcoming Barriers
11. Source of Information about Health
12. Health Perceptions
13. Recommendations/Advice/Suggestions for Change
14. Good Quote

Code Book

1. Introductions/General

Refers to opening questions. Captures background information about the participant and general rapport building discussions. Can include discussions about the participant's job, school, normal day, what they do for down time, etc.

2. Neighborhood Characteristics

Refers to discussions about the participant's neighborhood. This could include a variety of things, such as friendliness of neighbors, amenities (i.e. community centers, parks, schools, etc.), crime, changes in the neighborhood. Be sure to double code discussions around crime and safety with "Safety".

2. 1 Safety

Refers to discussions around perceived and actual safety within their neighborhoods, when walking around, etc. Safety has been identified as a barrier to physical activity, so be sure to use this when participants talk about how they overcome feeling unsafe when they walk, jog, etc.

3. Social/Cultural Perceptions

Perceptions of others' food and physical activity knowledge, beliefs, behaviors. Does not include health perceptions or body image perceptions. When appropriate, also use this to capture the question "why do you think some women are able to keep a healthy weight while others are not". Also includes types of food/physical activity in Soweto.

4. Access

Refers to discussions around proximity, availability, and cost of food and physical activity and exercise.

5. Family Relationships/Influence

This code is used to capture all discussions related to family members, in any context. Family members include mother, father, siblings, children, grandchildren, aunts, uncles, husband, etc. This code should also be used when mothers talk about their daughters in regards to eating, physical activity, and body weight.

6. Non-Family Relationships/Influence

This code is used to capture all discussions related to non-family members in any context. These people may include significant others (excluding husbands), friends, church

members, co-workers, neighbors. May be double coded with Neighborhood Characteristics when referring to neighbors.

7. Food/Food Behaviors

Refers to discussions around participant's behaviors around food, including (but not limited to) portion sizes, normal meals, snacks, cooking, take-aways, taste preferences, change over time, etc.

7.1 Diet

Refers to discussions around dieting: participant's definition of a diet, whether they have ever gone on one, etc.

7.2 Motivation/Feelings about Food

Refers to participant's thoughts and reflections on food, which may not be necessarily reflected in general food behaviors. This includes motivations to eat healthy/not healthy, what they feel about eating healthy, etc.

8. Physical Activity/PA Behaviors

Refers to discussions about participant's behaviors around physical activity and exercise, including (but not limited to) changes over time, sports, activities, etc.

8.1 Transportation

Refers to modes of transportation that the participant uses. Also refers to how long it takes to get places, and how far or close various places are to the participant's home.

8.2 Motivation/Feelings about PA

Refers to participant's thoughts and reflections on exercise and physical activity, which may not be necessarily reflected in general behaviors. This includes motivations to exercise/not exercises, what they feel about exercising, etc.

9. Body Image/Body Size

Captures discussions about body size, body type, and body image. This can refer to the participant's thoughts of their own body size and weight, or what they consider the ideal weight or body size to be for others their age.

10. Decision Making/Overcoming Barriers

Used to capture any discussion on how or why participants make certain health behaviors. For instance, the types of things that influence the food choices they make.

This code should also be used interpretively - if a participant talks about something they do to overcome a documented/perceived barrier to eating healthy and physical activity, use this code. Also use this to capture the question "why do you think some women are able to keep a healthy weight while others are not" when appropriate.

11. Source of Health Information

Refers to sources that people learn about health, including doctors, television, the internet, family members, Birth to Twenty, etc.

12. Health Perceptions

Refers to overall health perceptions. This includes the relative priority of health compared to other things (i.e. money, working, etc.), what it means to be healthy, the effects of eating too much unhealthy food, the health effects of unhealthy lifestyles, etc. Do not include perceptions of weight/body size unless there is specific discussion about health (i.e. heavy weight leads to high blood). Also includes what the participant considers healthy eating.

13. Recommendations/Advice

Refers to specific or general recommendations and advice provided by the participants in relation to change, improved health, healthy eating and physical activity, etc. Use this to capture the last two "advice" questions of the interview. Also use to capture thoughts around what the government and communities could do to improve the livelihood/quality of life in Soweto.

14. Good Quote

Quotes that are transient to the research questions. Use often!

Appendix 5: Advice and Recommendations Table

Topic	Suggestions

Eating Healthy	• Increase consumption of:
	  ○ water, fruits and vegetables, foods high in fiber, foods from across the food chain
	• Reduce consumption of:
	  ○ fizzy and cold drinks, oily foods, salt, sugar, animal based foods, dairy products, sweets, and junk, reuse of old cooking oil
	• Begin to eat healthy bit by bit
	• Vegetables need to be prepared in an exciting, tasty way

Physical Activity	• Start small and work your way up to more difficult activities
	  ○ Start with walking, then jogging, then calisthenics
	  ○ Jog before you join the gym so you don't get tired and waste your money
	• It's the little things
	  ○ Walk instead of drive, use the stairs instead of the lift
	  ○ Do work around the house that makes you sweat
	• Overcoming issues around safety:
	  ○ Walk with a friend/in a group
	  ○ Avoid traffic by jogging in the streets early or later (after morning rush)
	  ○ Walk/jog when it is not dark, and not too late into the evening
	  ○ Easier to do this in the spring and summer than winter
	  ○ Even though there may be crime, you are safe if you are from there because people will look out for you and will notice if there is something suspicious going on
	  ○ If you do something regularly enough, you just get used to it regardless of the threat to safety.
	  ○ Let someone know where you are/where you are going and what you are doing
	  ○ Don't go for a walk at the same time every day so people don't notice a pattern

Individual Motivations/Mindsets	• People need an individual motivating factor to help them be healthy. If they can't see what the benefit is for them individually, it won't matter. ○ "You can take a horse to the river, but you can't make him drink" • Don't stress about eating healthy – obsessing about weight makes you gain weight. Just eat normally. • People need self-discipline to both eat healthy and exercise • Our bodies are all different. At the end of the day, everything is based on how our bodies react.

	• Need to do things now in order to care for yourself in the future. Prevent problems before they happen. Don't just think about how you are right now. • Some people can't help how they eat, and it's not sufficient to just say 'be strict.' They need social support and more direction with their diet.

Society	• Government Intervention
	  ○ Education and awareness: need to show people how they can be healthy when they don't have money, not why it is important
	  ○ Address unemployment and access-related issues before addressing types of foods people should eat
	  ○ Support community initiatives that turn unused space into gardens, etc.
	  ○ Make junk food less available
	• Programs about healthy lifestyles directed at children need to be exciting
	• Target children when trying to change mindsets around health because people over 20 are hard-headed in Soweto
	• The time between high school and adulthood is the critical time when women don't have access to physical activity, and lose the habit