EXPLORING FOOD HABITS AND NUTRITIONAL BEHAVIOURS IN ADOLESCENTS AT A SECONDARY SCHOOL IN SOUTH AFRICA

by

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DECLARATION

I declare that **EXPLORING FOOD HABITS AND NUTRITIONAL BEHAVIOURS IN ADOLESCENTS AT A SECONDARY SCHOOL IN SOUTH AFRICA** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.

15 November 2015

..... **.....**

SIGNATURE **Date**

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ABSTRACT

The purpose this study was to explore food habits and nutritional behaviours of adolescents in a school in Lenasia South, in Gauteng Province. Qualitative, explorative research was conducted in order to recommend effective prevention strategies of non-communicable diseases. Adolescents from the selected secondary school formed the sample of the study. Data collection was done using focus groups' discussions. Three focus group discussions were conducted in the study. The first group comprised of thirteen male adolescents, followed by ten female adolescents and the final group was a combination of both female and male learners to produce a homogenous group. Specific common eating habits and nutritional behaviours emerged from the focus group discussions which included skipping meals, high consumption of high energy dense foods and sweetened beverages. Consequently, when developing intervention programs and policies to improve health of adolescents, environmental influences that undermine efforts to improve adolescent's dietary behaviours must be addressed.

Keywords:

Adolescents; eating habits; non-communicable disease; nutritional behaviours.

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I dedicate this dissertation to:

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his continued understanding and moral support
during my studies

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LIST OF ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
CDC	Centre for disease control and prevention
CVD	Cardiovascular disease
CHF	Congestive heart failure
HIV	Human Immunodeficiency Virus
LDL	Low density Lipoprotein
MMR	Morbidity and mortality weekly report
NCDs	Non-communicable diseases
NHANES	National Health and Nutrition Examination Survey
NYPANS	National Physical and Nutrition Study
PAHO	Pan American Health Organisation
SA	South Africa
SSBs	Sugar-sweetened beverages
USDA	United States Department of Agriculture
WHA	World Health Assembly
WHO	World Health Organization

CHAPTER 1

ORIENTATION OF THE STUDY

1.1 INTRODUCTION

The escalating health care costs force public health stakeholders to look at methods of keeping people healthy, and the need for alternative approaches is a growing (Bloom, Cafiero, Jané-Llopis, Abrahams-Gessel, Bloom, Fathima, Feigl, Gaziano, Mowafi, Pandya, Prettner, Rosenberg, Seligman, Stein & Weinstein 2011:6a). According to the World Health Organization (WHO) (2011b), Baldwin, Kaneda, Amato and Nolan (2013), Lozano, Naghavi, Foreman, Lim, Shibuya, Aboyans and Murray (2012:2095), the cause of mortality and morbidity experienced today in many countries are preventable and controllable. The promotion of health and maintenance of healthy life-styles have become objectives of extreme importance to the health care profession as most lifestyle patterns for health behaviours are frequently tested and/or acquired during adolescence (Mummery & William 2012:95; Chelvakumar & Kessler 2010:157). Thus, interventions to promote positive health practices are best instigated in early adolescence (Verstraeten, Roberfroid, Leroy, Holdsworth, Maes & Kolsteren 2012:415).

Bargiota, Delizona, Tsitouras and Kouloulis (2013:246) report that adolescents are generally expected to enjoy good health that is less vulnerable compared to the young or very old while the actual picture is to some extent different. Inadequate diet and unfavourable environments in developing countries may negatively influence the growth and nutrition of the adolescents (Mummery & Williams 2012:95). Ogunkunle (2013:188) concurs by stating that adolescents are at a nutritionally vulnerable age group because of their increased nutritional needs, eating patterns, lifestyles and susceptibility to environmental influences. Ogunkunle (2013:188) therefore concludes that healthy eating habits play a fundamental role in growth and development during adolescence.

On the other hand, Birch and Fisher (1998:539-540) point out that poor eating habits are often observed in adolescents, whose diets are characterised by a low intake of dairy products, fruit, green vegetables, protein and iron, and a high intake of sugar, soft drinks, and sodium- and energy-dense food items, both in developed and developing

countries. Ogunkunle (2013:188) further accentuate that this eating pattern is of major concern because it can lead to overweight, obesity and a higher probability of chronic non-communicable diseases (NCDs), such as diabetes, high blood pressure, dyslipidaemia, cardiovascular diseases and cancer later in life.

The WHO (2011: E317) defines NCDs as chronic medical conditions or diseases which are non-infectious. Furthermore, some of the major NCDs are preceded by unhealthy behaviours followed by the emergence of metabolic risk factors and disease (Baldwin et al 2013:5; WHO 2011:E320). Mayosi, Flisher, Lalloo, Sitas, Tollman and Bradshaw (2009:934) highlight that the risk factors associated with NCDs are overweight and obesity, raised blood pressure, increased blood glucose levels and non-optimal blood cholesterol levels. Even so, most of these risk factors are considered modifiable through changes in behaviours. Bradshaw, Steyn, Levitt and Nojilan (2010) point out that the key behaviours that would reduce risk factors for NCDs are eating a healthy diet. However, the national surveillance suggests that patterns of unhealthy lifestyle are already present in adolescents as a result these risk factors must be addressed urgently to reduce the NCDs burden (Pan American Health Organisation (PAHO) 2011; Norman, Bradshaw, Schneider, Joubert, Groenewald, Lewin, Steyn, Vos, Laubscher, Nojilana, Pieterse (2007:637-41).

Therefore, school-based interventions targeting unhealthy eating patterns and food behaviours are important strategy in NCDs prevention. To recommend effective NCDs prevention strategies it is important to explore adolescent food habits and health behaviours, as schools are in a unique position to promote healthy dietary behaviours and help ensure appropriate nutrition intake.

1.2 BACKGROUND INFORMATION ABOUT THE RESEARCH PROBLEM

Non-communicable diseases are a global problem, and the burden they place on individuals and health systems is high and increasing (Bloom et al 2011a). While infectious diseases such as Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS), malaria, and tuberculosis capture much of the world's attention and resources, the four major NCDs − cardiovascular disease, most cancers, diabetes, and chronic respiratory diseases - will account for NCDs affect large numbers of people under the age of 60 and exact a huge toll on health, the economy, and human

potential (Mayosi et al 2009:936). The prevalence of NCDs is related to unhealthy behaviours and practices typically initiated in adolescence (Montazerifar, Karajibani & Dashipour 2012:63; Croll et al 2001:193). Consequently the increased prevalence of overweight in adolescents at a Secondary School in Lenasia South has stimulated interest in their lifestyle behaviours. The purpose of this research is to explore food habits and behaviours of adolescent at the school.

1.3 RESEARCH PROBLEM

Eating behaviours are crucial to adolescents' physical development, health, and identity and are determined by a wide range of factors (Croll, Nuemark-Sztainer & Story 2001:193). Croll et al (2001:194) further state that adolescence is also a time of growth and development, with total nutrient needs higher than at any other period during the life cycle. Thus, adequate intake of nutrients and energy is essential to healthy development. Furthermore, Taylor, Evers and McKenna (2005:22) concurs with Engelfriet, Hoekstra, Hoogenveen, Buchner, Van Rossum and Verschuren (2010:50) that behavioural patterns developed in adolescents are likely to influence long-term behaviours and have long term impact on health, given the development of identity and increased autonomy and independence during this time. Research shows that adolescents eating practises and nutritional intake may have long-term impacts on health (Engelfriet et al 2010:53; Croll et al 2001:194).

In South Africa there is little published data on adolescent food habits and nutritional behaviour (Rossouw, Grant & Viljoen 2012:907). Bauer, Yang and Austin (2004:40) depicts that individual and family influences are important in shaping childhood health habits, but school social environments may be special important influence of dietary pattern of adolescents. However many have recommended such intervention, but according to O'Toole, Anderson, Miller and Guthrie (2007:500), there has been little formative research exploring adolescents' food habits and nutritional behaviours. In the light of the above and the incredible rise in unhealthy body weight observed in learners at a secondary school in Lenasia South and given the many health implications of adolescent nutrition. Therefore there is an urgent need to study the food habits and food behaviour of adolescents at School to underpin the development of key objectives for focus in the development of school based intervention as school based interventions

targeting unhealthy eating are an important strategy in NCDs prevention (Verstraeten, Royen, Ochoa-Avile's, Penafiel, Holdsworth, Donoso, Maes & Kolsteren 2014:e87183).

1.4 AIM OF THE STUDY

1.4.1 Research purpose

The purpose of the study is to investigate adolescents' food eating habits and nutritional behaviours so as to recommend effective NCDs prevention strategies.

1.4.2 Research objectives

The objectives of the study were to

- explore and describe eating habits and nutritional behaviours in adolescents at a secondary school
- explore and describe the role played by adolescents' eating habits and nutritional behaviours in non-communicable diseases
- recommend effective prevention strategies of non-communicable diseases

1.4.3 Research questions

- What are the adolescents' food habits and nutritional behaviours in adolescents at a secondary school
- What are the effective preventive strategies to deal with non-communicable diseases among adolescents at a secondary school?

1.5 DEFINITIONS OF TERMS

- **Obesity** is a chronic disease characterised by an excess accumulation of body fat, and is associated with various co morbidities including heart disease, diabetes, hypertension, and certain cancers (Kiess, Galler, Reich, Muller, Kapallen, Deutscher, Raile & Kratzsch 2001:S79).

- **Healthy eating** − eating practices and behaviours that are consistent with improving, maintaining and /or enhancing health (Croll et al 2001:193).
- **Eating habits** can be defined as an eating action, which by repetition has become more or less spontaneous. There are both healthy and unhealthy eating habits characterised by a conditioned reflex resulting from a repeated consumption or non-consumption of food with a desire to continue its use (Hanning, Woodruff, Lambraki, Jessup & Murphy 2007:13).
- **Non-communicable diseases (NCDs)** are chronic medical conditions or diseases which are non-infectious. Common examples include stroke, heart attacks, diabetes, cancer, asthma and depression (Mayosi et al 2009:374).
- **Nutritional behaviour** − dietary patterns and changes in their eating patterns (United States Department of Agriculture 2010).

1.5.1 Operational definitions

- **Adolescence** is the period of rapid growth, both psychological and physical between childhood and adolescents of person between 10-19 years (WHO 2014). For the purpose of this study, an adolescent will be considered to be a person in secondary school, aged between 12 and 18 years.
- **Skipping meals** refers to participants consuming a main meal five times or less a week (Øverby, Margeirsdottir, Brunborg, Dahl-Jørgense & Andersen 2008:395).
- **Snacking** refers to any food eaten in the time between meals (Øverby et al 2008:395).
- **Main meal** refers to lunch, and dinner or supper (Overby et al 2008:395).
- **Fat cakes** refer to cakes that are deep fried (Sedibe, Feeley, Voorend, Griffiths, Doak & Norris 2014:116).
- **Kota** is a quarter loaf of white bread filled with a portion of fried chips, slice of processed meat, or street fried chicken and cheese (Sedibe et al 2014:116).

1.6 RESEARCH METHOD AND RESEARCH DESIGN

A qualitative, exploratory research design was used to explore and describe eating habits and nutritional behaviours in adolescents (Babbie 2007:92). The objective of

exploratory research was to gather preliminary information that would help define problems (Babbie 2007:87-92). The qualitative research is systematic, interactive, subjective thus ideal to describing life experiences and give them meaning (Creswell 2009:89; Bowling 2009:380; Brink 2006:113).The researcher followed this systematic approach to capture people's subjective accounts of nutritional behaviour through flexible and unstructured methods of inquiry (Bowling 2009:380). The qualitative method was seen as an appropriate method as it allowed for the collection of diverse experiences and views of adolescent eating habits and food behaviours. According to Holloway (2005:1), qualitative research can be an important tool in understanding the emotions perceptions and actions of people who suffer from a medical condition. Joubert and Ehrlich (2010:318) concur by stating that it is out of these perceptions and social influences that that behaviour, including health-related behaviour is born.

Furthermore, Holloway (2005:1) stipulates that the reasons for particular types of behaviours can only be understood when it is observed and people are asked about it. Therefore health or education policies can be developed through this type of research; policies for changing health behaviour can only be effective if the reasons for this behaviour are clearly understood (Creswell 2009:99).

1.7 THE SIGNIFICANCE OF THE STUDY

Proof of that evidence exists that adolescent obesity is, in fact, contributing to the non-communicable burden of disease in South Africa. Providing information on nutritional behaviours and the eating habits of adolescents is important in order to identify risky and unhealthy behaviour in this age group. The findings might assist the policy makers in executing effective intervention programmes that bring about positive changes in food intake and to reduce the occurrence and development of chronic NCDs later in life.

1.8 STRUCTURE OF THE DISSERTATION

CHAPTER 1: An introductory orientation.

An introductory orientation is provided to make the reader aware of the background, analysis of the problem, research question, aim of the study, the research method to be

used, and the significance of the study and an explanation of terms used in the investigation.

CHAPTER 2: Literature review

The researcher presents the literature review in order to gain clarity on the adolescent's food habits and nutritional behaviours of adolescents and the role played by adolescents eating habits and nutritional behaviours in non-communicable diseases.

CHAPTER 3: The research design

The qualitative explorative design implemented in this study is described according to the research problem, the aim of the investigation, the research method and tools (focus groups) the selection of the sample, ethical issues and trustworthiness, the researcher as participant and the processing of the results.

CHAPTER 4: Findings of the investigation

The results and a discussion of the investigation are provided and focus groups findings are discussed in relation to: background, literature review, followed by an integration of the results.

CHAPTER 5: Conclusions and recommendations

This chapter includes the findings emanating from the literature study, findings derived from the investigation, recommendations, conclusion of the investigation, contributions of the study, limitations of the current study and matters requiring further research.

1.9 CONCLUSION

In this chapter the researcher has outlined the background of the problem, statement of the problem, aim and programme of the study. Terms have been defined and the research has been demarcated. A preliminary literature study reveals and describes adolescents eating habits and nutritional behaviours.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents literature review on adolescent's food habits and health behaviours, in order to gain good understanding of not only key behaviour but also lifestyle behaviours which herald the emergence of metabolic risk factors and disease among adolescents that are associated with NCDs. Information was sourced from books, theses, media news and researched articles from different databases such as Ebsohost, Pubmed, Africa wide and Sabinet.

2.2 THE CONTEXTUALISATION OF LITERATURE REVIEW

2.2.1 Adolescents

Adolescence is generally described as a transitional phase of development that begins at the inception of puberty and continues into early adulthood (Chelvakumar & Kessler 2010:157). Generally, girls enter puberty earlier than boys − age 9-10 for girls and 10-11 for boys. In contrast to the slow, steady growth of the child, the adolescents experience markedly accelerates growth. During a 2 to 3 year growth surge dramatic alterations in the adolescent's body size and proportions occur (Bhattacharya & Barua 2013:35). As adolescents become more independent, they begin making their own meal and snack choices, and there tends to be a decrease in healthy eating habits (Feeley, Musenge, Pettifor & Norris 2012:e3). Adolescents have been shown to have an increased consumption of sweetened beverages and fast foods high in fat as well as a decreased consumption of fruits, vegetables, and dairy products (Mummery & Williams 2012:95).

Bargiota et al (2013:246) and Evans, Springer, Evans, Ranjit and Hoelscher (2010:388) point out that adolescence is a time of intense growth and development nutritional that is also marked by nutritional vulnerability in terms of energy and nutrient rich foods that are comparatively higher than any stage in the life of a human life. These authors

also assert that during this period high dietary need and various forces interact to make it challenging for adolescents to make healthy food choices. A major task of adolescence is to establish one's own identity, which involves a process of separation from one's parents (Voorend, Norris, Griffiths, Sedibe, Westerman & Doak 2011:1). Adolescents become more autonomous and spend more time away from home and family than they did when they were younger (Briefel, Wilson, & Gleason 2009:S80).

Even though their parents continue to be a key influence on their eating patterns, peers and broader social influences tend to become stronger (Temple & Steyn 2011:506). Adolescents are the target of advertisements for fast food restaurants, soft drinks, and foods that tend to be high in calories and low in nutrients (Griffiths, Rousham, Norris, Pettifor & Cameron 2008:866). As a result, many adolescents are not meeting recommendations for dietary intake, and a high percentage of youth are overweight. According to the United States (US) Department of Agriculture (USDA) Health Index Rating, 94 percent of children between thirteen and eighteen years old show poor-quality diet or diets in need of improvement (Lino, Gerrior, Basiotis & Anand 1998:2).

According to Neumark-Sztainer, Story, Hannan and Croll (2002:845), a research team has found that 70 percent of adolescent girls and 57 percent of adolescent boys eat less than the recommended amount of calcium (1300 milligrams per day or more); 68 percent of girls and 71 percent of boys eat fewer than five servings of fruits and vegetables a day; 48 percent of girls and 55 percent of boys eat too much fat (more than 30 percent of their calories from fat); and 33 percent of girls and 31 percent of boys are overweight or at risk for becoming overweight.

Feeley et al (2012:e1) concur with Bargiota et al (2013:246) and Mayosi et al (2009:14) that those dietary patterns that develop in childhood often are maintained into adulthood. It is well-established that more South African adolescents consistently do not meet healthy eating guidelines and there is a tendency for these adolescents to consume large amounts of energy-dense foods and low quantities of fruits and vegetables and sweetened beverages, and a low intake of fruit, vegetables, and dairy products; such behaviours have been found to be associated with poor nutritional quality (Feeley et al 2012:e1; Moreno, Rodriguez, Fleta, Bueno-Lozano & Bueno 2010:110). However, little research has been undertaken in low income areas, where the pace of transition is much greater than in high income, and, in consequence, the

environmental exposures that affect eating behaviours may be different (Feeley et al 2012:e1; Blake, Wethington, Farrell, Bisogni & Devine 2011:402). In South Africa, for example, individuals have a high exposure to fast foods because these foods are readily available from formal (commercial franchises) and informal (such as street vendors) outlets (Al-Hazzaa, Al-Sobayel, Abahussain, Qahwaji, Alahmadi & Musaiger 2014:205). Because adolescents acquire their food from several sources (home, school, and in the community), there is a risk of developing poor eating habits in all these environments (Boutelle, Fulkerson, Neumark-Sztainer, Story & French 2000:16).

Although adolescents seem not to be overly concerned about their nutrition and health, many teens are concerned about their weight. Adolescents, particularly adolescent girls, face intense pressures to be thin (Masse, Perna, Agurs-Collins & Chiriquí 2013:1597). Pressures to be thin come from within the family and from social influences beyond the family. Although it is desirable for youth to engage in behaviours aimed at healthy weight management, research shows that many adolescents are engaging in unhealthy weight control behaviours (Kothandan 2014:3; Moreno et al 2010:108). Ironically, overly restrictive dieting practices may lead to binge eating behaviours, which may have the unintended result of weight gain.

In a large study of adolescents, 57 percent of adolescent girls and 33 percent of adolescent boys reported the use of one or more of the following behaviours aimed at weight control over the past year: skipping meals, eating very little food, using a food substitute, fasting, or smoking more cigarettes (Sedibe et al 2014:114-115; Neumark-Sztainer, Story, Hannan, Perry & Irving 2002:171-178). Extreme weight control behaviours, including vomiting or use of laxatives, diet pills, or diuretics, were reported by 12 percent of the girls and 5 percent of the boys. Binge eating was reported by 17 percent of the adolescent girls and 8 percent of the adolescent boys.

Educating adolescents about healthy eating habits and increasing their exposure to healthy foods could help inculcate healthier nutritional behaviours and lead to a decrease in overweight/obesity and related health consequences like heart disease and diabetes (Norman et al 2007:640; Armstrong, Lambert & Lambert 2008:205). However, a limited number of studies have addressed to the issues of adolescent's health behaviours.

It can be concluded that adolescents of both sexes and in all income and racial/ethnic groups are at risk for dietary excesses and deficiencies. Dietary excesses of total fat, saturated fat, cholesterol, sodium, and sugar commonly occur. Most adolescents do not meet dietary recommendations for fruits, vegetables, and calcium-rich foods (Steyn, Fourie & Temple 2005). There are some factors that contribute to poor eating habits as stated by Stang and Story (2005) such as:

- Easily available, low-cost, high-fat and/or high-sugar, low-nutrient foods, such as French fries, candy, chips, or soda.
- Limited access to healthy foods that appeal to adolescents.
- Perception that healthy, low-in-fat, unprocessed, nutrient-dense foods (high in nutrients compared with their caloric content) are inconvenient and lack taste. Some examples of healthy snacks include fresh fruit, whole grain bread, or low fat yoghurt.
- Lack of knowledge regarding appropriate nutrition and the health impact of poor nutrition.
- Poor parental role modeling.
- Lack of food shopping and preparation classes at school (e.g., home economics), resulting in the lack of relevant skills.
- Increased incidence of disordered eating due to fear of weight gain and desire to build muscle mass (Stang & Story 2005).

2.2.2 Adolescents nutritional behaviours

The major threats to adolescent health are nutritional behaviours (Kothandan 2014:3). These nutritional behaviours have important life-long consequences; many of major health problems confronting our nation are the result of behaviours established during adolescence (Mayosi et al 2009:14). The health status of adolescents is concern of health care providers. As the future generations, health of adolescents influences not only their own health but also the health of future populations (Chelvakumar & Kessler 2010:157).

Nutrition behaviours are considered one of the key modifiable factors coupled with overweight and obesity; however, to effect change in the environments in which adolescents make their food choices, it is necessary to better understand these

behaviours and a range of other obesity-related factors (Li, Dibley, Sibbrittt & Yan 2010:78). Steyn (2010:63) assert that unhealthy nutrition behaviours during adolescence may negatively affect the short- and long-term health of individuals. Longitudinal studies of adolescents show an overall decline in nutritional quality (Mummery & Williams 2012:95) increase in total energy intake, tracking of eating patterns, food preferences and food choices and moderate or no tracking of total energy and specific nutrient intakes. These studies suggest that although healthy behaviours may be initially formed in childhood, many social and lifestyle factors influence change in adolescent nutrition behaviours (Li et al 2010:78). Australian studies report that while adolescents understand the importance, and recognise the value of healthy eating and dietary recommendations, the majority does not meet dietary guidelines, and many frequently consume foods high in fat and/or sugar and takeaway foods, and demonstrate suboptimal behaviours such as meal skipping and dangerous weight loss practices (Arcan, Kubik, Fulkerson & Story 2009:823).

Gender differences are found in adolescent nutrition behaviours with females more likely than males to exhibit healthy nutrition behaviours, males more likely to consume adequate amounts of vegetables and females more likely to consume adequate amounts of fruit (Mummery & Williams 2012:95). Adolescent nutrition behaviours are positively associated with parent healthy nutrition behaviours and time spent in educational-learning-related sedentary behaviours (Fulkerson, Neumark-Sztainer & Story 2006:529). Adolescent unhealthy nutrition behaviours are associated with time spent watching television, maternal unhealthy nutrition behaviours and having a television in an adolescent's bedroom. Meals skipping and not meeting dietary recommendations are associated with physical inactivity (Ogunkunle 2013:4). Some factors influencing adolescent food choices were discovered in 1998 by Caldwell, Nestle and Rogers (1998) and the findings were as follows:

- The primary reasons for adolescent food selection include: taste, familiarity/habit, health, dieting and satiety.
- Adolescents reported eating a more healthy and varied meal at dinner.
- When adolescents made food choices, they followed self-made food decision-making rules to resolves conflicting values. Within a meal, "taste" was more influential for the core item, but "health" rose up in influence for the secondary or

is “taste” may be the primary reason for a food choice, but when with family at dinners, health may be more influential than it would be with peers.

- Other factors that influenced food selection are negotiation patterns within the family and interactions with peers. When promoting healthy eating, educators should recognise the many dilemmas that adolescents face in making food choices. Educators can help adolescents eat healthy by providing guidance on:

    1. Developing food decisions
    2. Effectively negotiating with family members
    3. Appropriate peer interactions (Caldwell, Nestle & Rogers 1998)

Some nutrition-related concerns for adolescents include consumption of sugar-sweetened beverages (SSBs).

2.2.3 Beverage consumption among adolescents

Milk and 100% fruit juice are a source of water and provide key nutrients such as calcium and vitamin C (Center for Disease Control and Prevention (CDC) 2011:778). Other beverages, referred to as sugar drinks or sugar-sweetened beverages (SSBs) also are a source of water but have poor nutritional value. Sugar-sweetened beverages are the largest source of added sugars in the diet of U.S. youths, and the increased caloric intake resulting from these beverages is one factor contributing to the prevalence of obesity among adolescents in the United States (CDC 2011:778).

To determine the extent to which US adolescents consume different types of beverages and variations in consumption by sex and race/ethnicity, CDC analysed data from the 2010 National Youth Physical Activity and Nutrition Study (NYPANS). The findings in this report indicate that water, milk, and 100% fruit juices were the beverages most commonly consumed daily by high school students. These are healthful beverages, and milk and 100% fruit juice are sources of key nutrients. According to this analysis, however, daily consumption of regular soda or pop, sports drinks, and other SSBs also is common in this population.

Consumption of these beverages might be related to negative health outcomes (Briefel, Wilson & Gleason 2009:S79). A recent meta-analysis found soft drink intake to be

associated with increased energy intake and body weight, and with lower intakes of milk, calcium, and other nutrients (Vartanian, Schwartz & Brownwell 2007:666). Among adolescents specifically, SSBs consumption can contribute to weight gain, type 2 diabetes, and metabolic syndrome (Reedy & Krebs-Smith 2010:1481).

Compared with results from 24-hour dietary recall interviews conducted among persons aged 12–19 years as part of the National Health and Nutrition Examination Survey, findings from NYPANS are higher for daily consumption of 100% fruit juice, but lower for SSBs (Wang, Bleich & Gortmaker 2008:1608). However, a study using a questionnaire similar to that used in NYPANS among a population-based sample of public-school students in Texas found results more similar to those of NYPANS for daily consumption of milk, 100% fruit juice, and soda (Evans et al 2010:394). Results by sex and race/ethnicity from the Texas study also are similar to those in this report; both found that consumption of soda or pop, sports drinks, and other SSBs is highest among male and black students (Evans et al 2010:395).

When selecting beverages, adolescents should be aware that water and low-fat or fat-free milk are the most healthful. In limited amounts, 100% fruit juice also has health benefits. Adolescents also should be aware that consuming regular soda or pop, sports drinks, and other SSBs can lead to weight gain and diabetes. According to the American Academy of Paediatrics, routine ingestion of sports drinks by children and adolescents should be avoided or restricted (Evans et al 2010:394). In addition, a recommendation of the 2010 Dietary Guidelines for Americans is to reduce the intake of calories from solid fats and added sugars.

One such strategy is to limit access to these drinks in schools through policy and environmental change. Such efforts have met with considerable success. Still, additional strategies are needed to reduce SSBs consumption. Although changing school policy is an important first step, most calories from these drinks are consumed in the home (Wang et al 2008:e1610). It is critical, therefore, to involve families, the media, and other institutions that interact with adolescents to increase their awareness of possible detrimental health effects and discourage their consumption of SSBs.

2.2.4 Food-based dietary guideline on sugar consumption in South Africa

According to Steyn, Myburgh and Nel (2003:599), in 2002 the Department of Health in South Africa (SA) adopted food-based dietary guidelines, including one on sugar stating: “Use food and drinks containing sugar sparingly and not between meals”. Food-based dietary guidelines are simple dietary messages aimed at improving the health of the population by focusing on pertinent nutritional issues. South Africa currently has eleven such guidelines which are a public health measure for preventing nutritional disorders (Steyn & Temple 2012:01). These are shown in Table 2.1 below.

Table 2.1: South African food-based dietary guidelines approved by Department of Health as a health promotion tool

Food based dietary guideline	Underlying reason for guideline
Enjoy a variety of food	Protection against micronutrient
Be active	Prevention of non-communicable diseases
Make starchy the basis of most meals	Emphasising that carbohydrates also play a role. Also prevention of under-nutrition
Eat dry beans, peas, lentils, and soya regularly	Affordable source of protein and minerals
Chicken , dish, milk, meat or eggs can be eaten daily	Promoting sources of animal protein and contributing iron and calcium
Drink lots of clean water	To maintain healthy body hydration
Eat plenty of fruit and vegetables every day	For prevention of non-communicable diseases and micro-nutrient deficiencies
Eat fats sparingly	Prevention of non-communicable diseases
Use salt sparingly	Prevention of hypertension
Use food and drinks containing sugar sparingly and not between meals	Prevention of dental caries
If you drink alcohol, drink sensibly	Prevention of chronic alcoholism and micronutrient deficiencies

(Steyn & Temple 2012:01)

The food-based guideline on sugar intake was based on evidence published by the WHO Expert Consultation Group (WHO 2003) as well as evidence from local SA studies published in peer reviewed journals up to, and including, the time the manuscript was published.

The authors (Steyn & Temple 2012) believed that there was adequate evidence available at the time showing an association between a high sugar intake and increased risk of dental caries and obesity. At the time increased risk due to sugar intake was not associated with any other disease conditions.

2.3 GLOBAL BURDEN OF NON-COMMUNICABLE DISEASES

2.3.1 Defining NCDS

Non-communicable diseases are defined as diseases of long duration, generally slow progression and they are the major cause of adult mortality and morbidity worldwide (WHO 2005a). Four main diseases are generally regarded to be dominant in NCDs mortality and morbidity: cardiovascular diseases (including heart disease and stroke), diabetes, cancer and chronic respiratory diseases (including chronic obstructive pulmonary disease and asthma) non-communicable diseases have been established as an apparent menace not only to human health, but also to development and economic growth (Kearney, Whelton, Reynolds, Muntner, Whelton & He 2005:220). Claiming 60% of all deaths, these diseases are presently the world's main killer (WHO 2011a; WHO 2005a). Eighty percent of these deaths now occur in low- and middle-income countries. Half of those who die of chronic non-communicable diseases are in the prime of their productive years, and thus, the disability imposed and the lives lost are also endangering industry competitiveness across borders (Murray, Vos, Lozano, Naghavi, Flaxman, Michaud, Ezzati, Shibuya, Salomon, Abdalla, Aboyans, Abrahams, et al 2012:2197).

Murray et al (2012:2198) further elaborate that the results are indisputable: a unified front is needed to turn the tide on NCDs and that not only governments, but also civil society and the private sector must commit to the highest level of commitment in combating these diseases and their rising economic burden. Global business leaders are extremely aware of the problems posed by NCDs.

A survey of business executives from around the world, conducted by the World Economic Forum since 2009, identified NCDs as one of the leading threats to global economic growth (Bloom, Chisholm, Jané-Llopis, Prettner, Stein, & Feigl 2011b). Therefore, it is also important for the private sector to have a strategic vision on how to

fulfil its role as a key agent for change and how to facilitate the adoption of healthier lifestyles not only by consumers, but also by employees. The need to create a global vision and a collective understanding of the action required by all sectors and stakeholders in society has reached top priority on the global agenda this year, with the United Nations General Assembly convening a High-Level Meeting on the prevention and control of NCDs (Bloom et al 2011b). They are being encouraged to focus on an emerging challenge to health, well-being and development: non-communicable diseases.

2.3.2 Background on NCDs

According to WHO (20011a) non-communicable diseases inflict a large burden on human health worldwide. At the moment, more than 60% of all deaths worldwide stem from NCDs (Figure 2.1).

Furthermore, what were once considered “diseases of affluence” have now invaded on developing countries. Murray and Lopez (1997:1436) point out that in 2008, just about four out of five NCD deaths occurred in low- and middle-income countries (WHO 2011:5a), up sharply from just fewer than 40% in 1990. In addition, NCDs are having an effect right through the age distribution – already, one-quarter of all NCDs-related deaths are among people below the age of 60 (WHO 2011a). NCDs also account for 48% of the healthy life years lost (Disability Adjusted Life Years [DALYs]) worldwide (versus 40% for communicable diseases, maternal and perinatal conditions and nutritional deficiencies, and 1% for injuries) (WHO 2005a; Lozano et al 2012:295).

As mentioned earlier, 60% of all deaths worldwide currently stem from NCDs – predominantly cardiovascular diseases, cancers, chronic respiratory diseases and diabetes (Allender et al 2010 297; Kearney et al 2005:217; WHO 2005a.) These deaths are distributed widely among the world’s population – from high income to low-income countries and from young to old. NCDs have a large impact, undercutting productivity and boosting healthcare outlays. Moreover, the number of people affected by NCDs is expected to rise substantially in the coming decades, reflecting an ageing and increasing global population (WHO 2011:5a).

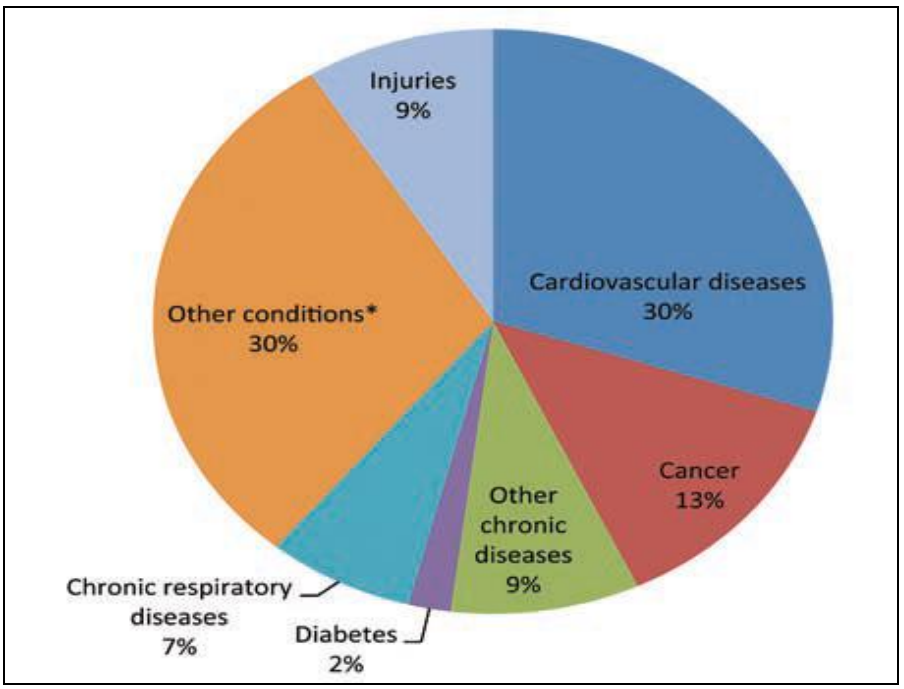


Figure 2.1: NCDs constitutes more than 60% of death worldwide

(WHO 2005a)

Preceding research has documented the impact of non-communicable diseases worldwide, in terms of avoidable deaths (Marrero, Bloom & Adashi 2012:2037), disability (Murray et al 2012:2220; Salomon, Wang, Freeman, Vos, Flaxman, Lopez & Murray (2012:2144), and economic impact (Abegunde, Mathers, Adam, Ortegon & Strong 2007:1929). Studies have accentuated the potential increase in chronic disease in developing and emerging nations and the overall impact on population health that this could have (Kearney et al 2005:220).

2.3.3 Global burden of non-communicable diseases among adolescence

Behaviours established during adolescence have life-long consequences for non-communicable diseases are essential for preventing NCDs (Taylor et al 2005:24). In 2008, 36 million people died from NCDs. NCDs-related deaths are increasing, especially in low and middle-income countries (WHO 2011:5a) and over half are associated with behaviours that begin or are reinforced during adolescence, including poor eating habits, and lack of exercise. Global trends indicate that these NCDs-related behaviours are on the rise among young people, and that they establish patterns of behaviour that persist throughout life and are often hard to change. In 2011, the World Health Assembly (WHA) (2011:4) endorsed a resolution calling upon member states to

address the needs of youth in the context of NCDs (Bloom, Cohen & Freeman 2010:78; Conklin, Forouhi, Surtees, Wareham & Monsivais 2015:692; Kiess et al 2001:S77). Evidence points to adolescence as a crucial period in the development of adult NCDs: Diabetes, stroke and cancer: Nearly three out of four obese adolescents remain obese as adults, increasing their risk of heart disease, type 2 diabetes, stroke and cancers (Dehghan, Akhtar-Danesh & Merchant 2005:24; Mayosi et al 2009: 934).

Non-communicable disease, such as coronary heart disease, stroke, obesity, hypertension type 2 diabetes mellitus, eating disorders and various cancers are still the most common causes of morbidity and mortality in European countries (Baldwin et al 2013:6; Kruger, Puoane, Senekal & Van der Merwe 2005:498). The highly prevalent diseases occur into the fore of increasing knowledge, awareness and education about chronic diseases and risk factors (Mayosi et al 2009:935). It has been suggested that a paradigm shift is necessary, if future progress is to be made. Most of the diseases have their origin their origin during childhood and adolescence (Hart, Raynor, Jelalian & Drotart 2010:396) but the complex relationship between all of these processes and the development of non-communicable diseases is poorly understood in adolescents.

Existing research indicate that risk factors for non-communicable disease have to be placed in ecological context, which needs a collaborative strategy within the multiple sectors that impact on the diseases (Bloom et al 2010:71). In adequate dietary habits and physical in activity are the major preventable risk factors in childhood and adolescence may reduce morbidity and mortality in adulthood.

In the developing world, where the emphasis has traditionally only been on under-nutrition, the prevalence of obesity is also emerging at a rapid rate (Steyn & Temple 2012:1). In contrast to the nutrient deficiencies in South Africa, 56, 2% of the adult population was recorded overweight or obese in 2003 (Marrero, Bloom & Adashi 2012:2038). The highest prevalence of obesity was noticed in the female population, with 23.3% obese. The global burden of disease has seen a detectable increase in the amount of people suffering and dying due to non-communicable disease was 27%, which in developing countries is envisaged to increase to half of the total burden (WHO 2008). To a greater extent, children can now be classified as overweight or obese. In 2002 South Africa had a death rate of around 679 900 deaths per year, 65% of which

could be designated to communicable diseases, 28% to non-communicable diseases (Mayosi et al 2009: 934).

The CDC (2011:780) states that in order to improve the health of the adolescent population, effective programs/interventions focused on modifying unhealthy lifestyle behaviours are needed. Furthermore, these improvements in dietary patterns have the aptitude to diminish risk factors for chronic disease such as overweight, obesity, blood lipid levels, and glucose homeostasis. The question that remains, however, is how we can influence adolescents to embrace healthy behaviours to improve their health status. A 197% increase in obesity-associated hospitalisations among adolescents has been seen in the past 20 years and reflects the impact of the escalating severity of obesity (Casazza & Ciccazzo 2006:46).

In the developing world, where the emphasis has traditionally only been on under-nutrition, the prevalence of obesity is also emerging at a rapid rate (Steyn & Temple 2012:2). In contrast to the nutrient deficiencies in South Africa, 56,2% of the adult population was recorded overweight or obese in 2003 (WHO 2008). The highest prevalence of obesity was noticed in the female population, with 23.3% obese. The global burden of disease has seen a detectable increase in the amount of people suffering and dying due to non-communicable disease was 27%, which in developing countries is envisaged to increase to half of the total burden (WHO 2008). To a greater extent, children can now be classified as overweight or obese.

2.3.3.1 Obesity an NCDs risk factor

Obesity in adolescents is escalating at an alarming and on the brink of an epidemic in many economically and developed countries particularly in United States of America, Canada, Australia and several European countries (Rahman, Islam & Alam 2014:70) 2014:70). Similarly in developing countries this issue is emerging as a public health crisis. By 2020, it is estimated that the prevalence of childhood obesity will reach approximately 60 million. Factors contributing to the rising levels of childhood obesity in developing countries include socio-economic development, changes in the activity and unhealthy diet, living patterns, as well as rapid epidemiological and demographic transition (Battacharya & Barua 2013:35). Kothandan (2014:1) concurs by stipulating that prevention is crucial, as childhood obesity is associated with several chronic

conditions in adult hood and premature mortality thereby aggravating the burden on healthy systems and hindering economic growth and development. Ironically, obesity is now common even in rural and under-developed areas, including those with a high prevalence of HIV and under nutrition.

Rossouw et al (2012:907) affirm the occurrence of overweight and obesity in South African children at present is said to be least comparable to that found in developed countries more than a decade ago. Rossouw et al (2012:907) further articulate that the occurrence of overweight and obesity in South Africa is actually on par with that of many industrialised nations and amongst the highest in Africa. In general there appears to be an increase in the prevalence of overweight or obesity in childhood and adolescence in South Africa (Rossouw et al 2012:907). The increasing prevalence of childhood obesity has been a growing matter of public concern (Casazza & Ciccazza 2006:45).

Previously, in urban Soweto, the combined prevalence of overweight and obesity in girls and boys was 27.3% and 6.9%, respectively, at age 17 years, within the birth to 20 cohort (Feeley, Pettifor & Norris 2009:252). Poor eating habits across the domains of the home, school and community in adolescents were reported in the same cohort. Within the home, adolescent girls and boys aged 13, 15, and 17 years showed a decrease in regular (at least three times a week) breakfast consumption practices (76.4%, 63.8% and 65.3%, respectively). At school, lunch box usage was uncommon, and declined from 17% at age 13 years to 8.6% by age 17 (Feely, Musenge, Pettifor & Norris 2012:e3). More than 80% of participants bought food from the tuck shop. The five most popular purchases for all ages were sweets, crisps, cold drinks, fried chips and white bread, accounting for 62% of purchases. Female participants consumed more confectionary options than males within the community environment. Sweets, crisps and soft drinks were the three most popular confectionary or beverage items, accounting for >65% of items purchased at all time points (Feely et al 2012:e3). Interventions aimed at modifying adolescent eating and physical activity practices have met with mixed success, which, in part, may be because of inadequate understanding of the factors that influence eating and exercise beliefs and behaviour by adolescents.

2.3.3.2 Complications of adolescent obesity and overweight

Obesity can be defined as an over-accumulation of adipose tissue because of a positive energy balance (Underhay, De Ridder, Van Rooyen & Kruger 2003:77; Rossouw et al 2012:1) the accumulation of body fat is an indication that more energy has been stored than has been used (Rossouw et al 2012:1).Obesity is a medical condition in which excess body fat has accumulated to the extent that it have an adverse effect on health (Rossouw et al 2012:12).

Abegunde et al (2007:1932) report that adolescent obesity is a multisystem disease with potentially devastating consequences. Several complications warrant special attention. As with adults, obesity in adolescent obesity causes hypertension, dyslipidaemia, and chronic inflammation, increased blood clotting tendency, endothelial dysfunction, and hyperinsulinaemia. Among adolescents who died of traumatic causes, the presence of cardiovascular disease risk factors correlated with asymptomatic coronary athero-sclerosis, and lesions were more advanced in obese individuals (De Onis & Blossner 2012:1032).

Furthermore, the emergence of type 2 diabetes in adolescents represents an ominous development, in view of the macrovascular (heart disease, stroke, limb amputation) and microvascular (kidney failure, blindness) sequelae. Frequent pulmonary complications include sleep disordered breathing (sleep apnoea), asthma, and exercise intolerance. Development of asthma or exercise intolerance in an obese adolescent can limit physical activity and thus cause further weight gain. Furthermore, serious hepatic, renal, musculoskeletal and neurological complications have been increasingly recognised (Prentice 2006:97).

De Onis and Blossner (2012:1035) stipulate that findings of many studies indicate considerable psychosocial consequences of adolescent obesity. Obese adolescents show declining degrees of self-esteem associated with sadness, loneliness, nervousness, and high-risk behaviours. Risk of obesity-related complications can differ by ethnic origin and as a result of cultural factors. Black and Hispanic youths in the USA, for example, are at greater risk for type 2 diabetes and cardiovascular disease than their white counterparts (Mc Naughton, Ball, Mishra & Crawford 2008:366). Obesity only partly explains this raised disease risk, since fasting serum insulin concentration

and prevalence of the insulin resistance syndrome remain much higher in minority youths after statistical adjustment for Basal Metabolic Index or adiposity (Power, Bindler, Goetz & Daratha 2010:16).

2.3.3.3 Cardiovascular disease

Cardiovascular disease (CVD) refers to a group of diseases relating to the heart, blood vessels, or the sequelae of poor blood supply due to a diseased vascular supply (Allender, Lacey, Webster, Rayner, Deepa, Scarborough, Arambepola, Datta & Mohan 2010:297). Furthermore, more than 82% of the mortality burden is caused by ischaemic or coronary heart disease, stroke (both hemorrhagic and ischaemic), hypertensive heart disease or congestive heart failure (CHF). Over the past decade, CVD has become the single largest cause of death worldwide, representing nearly 30% of all deaths and about 50% of NCD deaths (WHO 2011a). In 2008, CVD caused an estimated 17 million deaths and led to 151 million DALYs (representing 10% of all DALYs in that year). Behavioural risk factors such as physical inactivity, tobacco use and unhealthy diet explain nearly 80% of the CVD burden (Mayosi et al 2009:935).

Between 20 to 40% of adolescents are overweight (WHO 2011a). When they become adults, overweight adolescents are twice as likely to develop cardiovascular disease and have seven times greater risk of developing atherosclerosis (Mayosi et al 2009:934; Webb & Prentice 2006:26). They also face an increased risk for cancer, stroke, hypertension, and type 2 diabetes (Kornides, Nansel, Quick, Haynie, Lipsky, Laffel & Mehta 2013:406). Steyn and Temple (2012:2) point out that although there is less evidence that SSBs causes cardiovascular diseases. However, there is still sufficient evidence to show that SSBs also impact on this area of health. Furthermore, a high intake of sugar does not only inevitably leads to a reduced dietary intake of micronutrients but also strong evidence has emerged in recent years that links intake of sugar, especially SSBs, with an increased risk of obesity and type 2 diabetes . This relationship may also be true for coronary heart diseases.

2.3.3.4 Hypertension

Hypertension of high blood pressure is a chronic medical condition in which the blood pressure in the arteries is elevated (Belue, Okoror, Iwelunmor, Taylor, Degboe,

Agyemang & Ogedegbe, 2009:13). This requires the heart to work harder than normal in order to circulate blood through the blood vessels. The significant increase in hypertension in the past ten years, as well as inadequate diagnosis and control of raised blood pressure, predicts an increase in strokes and heart attacks in the years to come. Predisposing factors such as high salt intake and increasing levels of obesity must be addressed to reduce high blood pressure in the future (Deliens, Clarys, De Bourdeaudhuij & Deforche 2014:02).

2.3.3.4 Diabetes and high serum cholesterol

Diabetes is a metabolic disorder in which the body is unable to aptly regulate the level of sugar, specifically glucose, in the blood, either by poor sensitivity to the protein insulin, or due to inadequate production of insulin by the pancreas (BeLue et al 2009:13). Type 2 diabetes accounts for 90-95% of all diabetes cases. Diabetes itself is not a high-mortality condition (1.3 million deaths globally), but it is a major risk factor for other causes of death and has a high attributable burden of disability (Allender et al 2010:297). Diabetes is also a major risk factor for cardiovascular disease, kidney disease and blindness.

Overweight children are at much greater risk for the development of type 2 diabetes (Bantle, Wylie-Rosett, Albright, Apovian, Clark, Franz, Hoogwerf, Lichtenstein, Mayer-Davis, Mooradian & Wheeler 2008:563). Casazza and Ciccazza (2006:45) further explains that excess adipose tissue plays a role in causing defects in insulin regulation and likely contributes to the pathogenesis of type 2 diabetes.

Furthermore, the uncontrolled levels of glucose in the blood lead to the glycosylation of blood proteins that, over time, cause damage of the vascular tissue. As a result, there is approximately a 3-fold increase in the development of heart disease in those with diabetes over the non-diabetic population (McNaughton et al 2008: 66). In other words, obesity not only leads to the development of type 2 diabetes but also exhibits the complications that play a part in the morbidity and mortality of the disease (Arredondo & Aviles 2015:e1186).

Hypercholesterolemia is the presence of high levels of cholesterol in the blood (Kontush & Chapman 2006:144). It is a form of “hyperlipoproteinemia” elevated levels of

lipoproteins in the blood). High serum cholesterol has emerged as an important cardiovascular disease risk factor (BeLue et al 2010:14). Although there are no national data on the trends, there is evidence of increases in the prevalence of diabetes and raised density lipoprotein cholesterol among urban Africans in Cape Town. The increasing predisposing factors of unhealthy diets, lack of regulate physical activity resulting on overweight and obesity, inevitably contribute to the rising prevalence, these conditions are poorly diagnosed (Chourdakis, Tzellos, Papazisis, Toulis & Kouvelas 2010:722).

2.4 INDIVIDUAL, INTERPERSONAL AND ENVIRONMENTAL INFLUENCES ON ADOLESCENT EATING BEHAVIOURS

Story, Neumark-Sztainer and French (2002:42) state that in order to develop a true understanding of adolescents' eating behaviour and food choices it is necessary to briefly consider such behaviour from an ecological perspective. The trio further point out that there are four levels of influence that impact on the nutritional health of teens.

Firstly, individual or intrapersonal factors such as the psycho-social and biological factors immediately drive behaviour. Secondly, the social environment (or interpersonal factors) in which the adolescent lives, in terms of peers and family members, plays a strong role. Thirdly, one needs to place the adolescent in the perspective of his/her community and environment in terms of influences impacting on nutrition-related behaviour. Outside influences such as availability and access to fast food outlets, school tuck-shops, food stores and vendors in the vicinity may play a role in his/her decision-making (Al-Hazzaa et al 2014:206).

Lastly the macro environment needs to be understood in terms of the society in which the adolescent finds himself/herself. The latter influences include effects of mass media and advertising. For example, research in the USA since the nineties has shown that advertisements on children's programmes on television are often the direct opposite of the commended diet. They are mainly for fast foods and for foods rich in sugar and fat (Moreno et al 2010:109). Very few, if any broadcast a fruit and vegetable intake. According to Temple and Steyn (2008:781), many studies have reported that adolescents frequently consume an energy-dense diet which is of poor quality in terms of essential micronutrients. This is attributed to many factors including low meal

frequency; skipping breakfast; high consumption of sweetened beverages (Nago, Lachat, Hybregts, Roberfroid, Dossa & Kolsteren 2010:283; Sebastian, Wilkinson, Enns & Goldman 2009:226); increased consumption of energy-dense foods; increased consumption of food away from home; and skipping meals (Moreno et al 2010:109; Li et al 2010:80; Burgess-Champoux, Larson, Neumark-Sztainer, Hannan & Story 2009:83).

Existing reviews (Raine 2005:10; Paquette 2005:18), differentiate between individual, interpersonal, and environmental determinants of unhealthy eating (Kalavana 2010:44). Among individuals determinants, desire to look after one's appearance, flavour perception, food liking, health knowledge perceptions and belief and (lack of power) will power are the most frequently mentioned (Kalavana 2010:45). Among the interpersonal family and peer in influence are the most significant, while physical environment (availability and accessibility of food), but also the media the media (especially television) seem to be determinants for young people (Kalavana 2010:44).

Among interpersonal factors that have been observed as determinants of eating behaviour, family influence is perhaps the most important one. Several studies have indicated that parents do attempts to influence their children's eating habits and encourage healthy eating (Raine 2005:08). Other studies showed that a perceived negative family environment significantly predicted problematic dieting behaviour in adolescent girls and was also associated with the development of eating disorders (Kornides et al 2013:405).

Moreover, several studies indicated a negative association between family cohesion, a supportive family climate or bonding on one hand and risk behaviour in adolescent on the other (Power et al 2010:16). Doherty and Allen (1994) argued that the poorer the qualities of family relationships, the more adolescents are apt to adopt negative health eating behaviour.

Adolescents at this period of their lives also seek peer approval and social identity. Hence it can be assumed that peer influences and group conformity can be considered as important determinants in food acceptability and selection. Baker, Little and Bronwell (2003:189) examining eating behaviours in a sample of 279 adolescents indicated that social norms do play a role in adolescent decision-making about eating through their influence on attitudes.

In developing countries, urban residence and high socio economic status have been positively associated with frequency of intake of energy-dense foods in adolescents. A study in Costa Rica by noted that 30% of adolescents exceeded the American Heart Association dietary recommendations for total fat and saturated fat and 50% reported a higher cholesterol intake (Nago et al 2010:283). In China, a study by Shi, Lien, Kumar and Holmboe-Ottesen (2005:1442) found that high socioeconomic status and urban residence were positively associated with intake of high-energy foods such as foods of animal origin. In South Africa there is little published data on adolescent food patterns and nutrition-related knowledge.

2.5 ADOLESCENTS' FOOD PREFERENCES AND DEVELOPMENT OF NEW HEALTHY FOODS

There are many concerns surrounding adolescent food choice behaviour, including low intake of fruits and vegetables, and high intake of foods that are high in fat, sugar and salt (Voorend et al 2011:01). Although many adolescents demonstrate awareness and knowledge of nutrition and healthy eating, it does appear they find it difficult putting this theory into practice (Sebastian, Wilkinson & Goldman 2009:230). A lack of understanding about how to communicate dietary messages effectively is hindering the innovation of products that can contribute to consumer health, well-being and enhanced industrial competitiveness (KaraChan, Gronhoy & Bech-Larsen 2011:59). Small and medium-sized enterprises play an important role in producing the great diversity of foods in Europe and the retail sector increasingly contributes to strengthening links between production, processing and the consumer (KaraChan et al 2011:70).Therefore, there is a need to better understand consumer requirements and preferences, and to provide a healthy safe and high-quality food supply in this case, specifically for adolescents (KaraChan et al 2011:71).

According to Contento, Williams, Michela and Franklin (2006:575), there are multitude of factors that can influence adolescent food choices, and preferences. In general terms these may include availability, convenience, and cost influence of peers, parents, and hunger and health concerns (Boutelle et al 2000:18). However, one of the most important determinants of food choices and preferences is taste. Taste in particular, plays an important role in food choice. Generally speaking, adolescents will not eat what

they do not like (Hoffmann, Bryl, Marcinkowski, Rzesoś, Wojtyła & Pupek-Musialik 2012:105).

2.6 BARRIERS TO HEALTHY EATING HABITS

Young people's diets in America have been described as high in saturated fat, high in sugar, low in vitamins and minerals, and low in fibre (Kalavana 2010:44). Adams (1997:36) identified four categories of barriers to healthy eating: individual, environmental, other behaviours, and policy. Individual barriers to healthy eating include attitudes and perceptions regarding foods and how much sacrifice is required to eat nutritious (Scully, Dixon & Wakefield 2009:107; Shepherd, Harden, Rees, Brunton, Garcia, Oliver & Oakley 2006:239). Environmental barriers include a wide array of influences outside the individual, such as family and cultural factors, peer influences, media messages, and structural barriers such as a lack of healthy food choices in schools. When other risky behaviours (e.g., tobacco, alcohol, and other drug use) interfere with an adolescent's ability to practice healthy eating habits, there is a confounding, harmful effect on overall health (Rom et al 2013:25).

2.6.1 Overcoming barriers in adolescent nutrition

Successfully meeting the challenges of adolescent nutrition requires collaboration among parents, teachers and other school personnel, key community members, registered dieticians, adolescent health care providers, researchers, policymakers, and adolescents themselves. Adams (1997:36) identified the following key tasks for improving adolescent nutrition:

- realistically define healthy eating for adolescents
- simplify and clarify messages that extol healthy eating
- reframe the healthy eating message to appeal to adolescents
- promote skills-based interventions to reinforce the message
- strengthen environmental support for adolescent nutrition. Because social-environmental factors greatly influence dietary behaviours, more needs to be done to incorporate these factors into effective interventions. For example, nutrition education needs to incorporate the teaching of media literacy skills so

that children and adolescents can resist advertising that promotes unhealthy eating.

Nutrition education also needs to expand the use of peer leaders and educators to create positive peer influences. Little is known about how to influence parenting style to improve dietary behaviours among youth (Fulkerson et al 2006:530). Personal factors also significantly influence dietary behaviours. One personal factor in need of more study is how adolescents' developmental need to establish a unique identity influences their dietary behaviours (Contento et al 2006:578). Another is how children learn the functional meanings of foods (i.e., the reasons people give for eating particular foods or for adopting particular dietary patterns). For instance, young people may eat to have fun with friends or to cope with stress and boredom. Functional meanings of foods are taught in the home in a variety of ways. Parents may use food to reward children for good behaviour, or they may model unhealthy behaviour by using food to cope with boredom or stress (Kornides et al 2013:410). Schools also teach functional meanings of foods when food coupons are used as incentives for reading or when candy bars are passed out to those who score high grades (Briefel et al 2009:S78). The functional meaning of foods in the school environment must be addressed by adopting school policies that deal with the availability and use of foods in the school (Story et al 2002:S43).

At the level of behavioural factors that influence dietary behaviours, more work needs to be done to teach students essential life skills in problem solving, critical thinking, decision-making, stress management, and healthy coping. Adolescents need to acquire the life skills of meal planning and food preparation. Both in school and at home, adolescents need opportunities to learn how to plan and prepare quick, economical, healthful meals (Franko, Thompson, Affenito, Barton & Striegel-Moore 2008:S112) that will easily integrate into their unique, fast-paced lifestyles. Schools can play a vital role in promoting adolescent nutrition by implementing nutrition education and school nutrition services that promote healthy eating. Caldwell, Nestle and Rogers (1998) have recommended that schools take these eight important steps in Box 2.1 below:

Box 2.1: Recommendations to promote healthy eating in schools

Recommendations to promote healthy eating in schools

1. Establish a coordinating group to assess school nutrition needs and develop a strategic plan for addressing those needs.
2. Develop and implement policies consistent with the strategic plan that reflect healthy eating as a high priority in the school.
3. Ensure adequate funding for school nutrition services.
4. Hire qualified school nutrition managers and directors.
5. Teach nutrition education as part of skills-based, comprehensive health education, and enliven the curricula with relevant, fun, and interactive learning strategies.
6. Ensure that all teachers and other relevant staff participate in appropriate in-service training.
7. Involve families and community organisations in policy development and program planning.
8. Conduct ongoing evaluation of the effectiveness of school nutrition efforts, and use the results to improve them.

Caldwell et al (1998)

Some school-based strategies that promote healthful eating among middle school and high school students are listed as Annexure F.

2.7 EVALUATION OF INTERVENTIONS.

2.7.1 Nutrition eeducation

Studies demonstrate that although adolescents' knowledge of healthy eating habits and consumption of fruits and vegetables are low, their attitudes toward learning about healthier eating practices are favourable (Casazza & Ciccazzo 2006:45). Interventions that include nutrition and overall health education, therefore, have the potential to improve lifestyle habits and influence the future health of adolescents (Overby et al 2008: 395). Even individuals who have the genetic propensity to develop diseases such as type 2 diabetes or cardiovascular disease may be able to delay or prevent the onset of disease with improved lifestyle habits. Nevertheless, providing effective preventive services to this population presents many challenges (Temple, Steyn, Myburgh & Nel 2006:252). Traditional nutrition education models emphasise increasing the knowledge of participants with the rationale that increased knowledge will lead to behaviour changes (O'Toole et al 2007:501). However, such programs have done little to elicit

change in food/nutrient intake (Verstraeten et al 2014:2). In a review of 43 general nutrition intervention programs from 1990 to 1994, the authors concluded that a behavioral focus, as well as incorporation of appropriate instruction, is necessary for intervention effectiveness (Casazza & Ciccazzo 2006:44).

Nevertheless, interventions tend to use a ‘‘one size-fits-all’’ traditional approach of teaching by telling. Although overweight adolescents tend to acquire a greater percentage of their caloric intake from fat and less from complex carbohydrates than normal-weight adolescents, 18 a study of 292 high school adolescents illustrated that overall nutrition knowledge did not differ between obese and non-obese adolescents (Casazza & Ciccazzo 2006:45). Additionally, protein, simple carbohydrate, and micronutrient intakes have been reported to be similar among obese and non-obese adolescents. The problem that remains is that an increase in knowledge does not necessarily result in a behaviour change (Sedibe et al 2014:115).

2.7.2 Interventions on eating habits and physical activity

Most studies dealing with nutritional status and physical activity among European adolescents conclude that nutritional interventions and to enhance physical activity are strongly needed (Casazza & Ciccazzo 2006:44). School based health and nutrition and education intervention in studies in Europe and the USA have had mixed results in effecting physiological changes (Casazza & Ciccazzo 2006:44). The major trials have been conducted in USA, and these are doubts whether these can be extrapolated to the great diversity of the European era (Temple, Steyn, Myburgh & Nel 2006:252). New and modern tools for health promotion in adolescent’s need to be developed focusing on this specific population and considering gender difference (Casazza & Ciccazzo 2006:44). Adolescence is a unique period in life. Health promotion should not force models of behaviour onto individual groups. Adolescents need a food culture based on foods to eat, rather than foods to avoid and an understanding of suitable weight control measures (Temple et al 2006:252).

2.8 RECOMMENDATIONS FOR NUTRITIONAL EDUCATION STRATEGIES

In terms of recommendations we should be reminded of the burden of the chronic non-communicable diseases in South Africa and the associated high mortality rate from

some of these diseases (Engelfriet et al 2010:50). Teenagers are on the brink of adulthood and it is likely that the dietary habits which have been fostered by the family and school will continue into adulthood. A low fat and saturated fat intake, on its own, is not adequate for the prevention of NCDs. Engelfriet et al (2010:52) postulate that "broader adherence to recommendations for daily intake of fruit and vegetables, fish and fatty acid composition may take away as much as 20-30% of the burden of cardiovascular disease and result in approximately one extra life year for a 40-year-old individual".

Ideally, South African children should learn about good nutrition at home and at school. There is sufficient convincing evidence that school-based curriculum-based nutrition programmes significantly increase children's nutrition knowledge and improve their dietary behaviour. Additionally, schools should develop school wellness policies and limit access to unhealthier (high sugar, high fat) food options on the premises (Briefel et al 2009:S78). The study will seek to explore the adolescents eating habits and nutritional behaviours, and utilise the information to come with intervention strategies that will reduce non-communicable diseases.

2.9 CONCLUSION

Reflecting on the above information, the researcher deems the consequences of unhealthy eating habits and poor nutritional choices are not only of great importance to adolescents and their future health and well-being but also to the public health systems. The researcher consequently supposes that behavioural patterns developed in adolescents are likely to influence long-term behaviours and have long term impact on health.

The next chapter gave a description of the research design, the population and purposeful sampling strategies, data collection strategies, research instruments, data collection procedures and design limitations.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

According to Polit and Beck (2008:66) and Brink (2006:92), research design and methodology reflect the plan or blueprint of how the researcher conducted the research. The purpose of this research design and methodology chapter is to outline the overall structure or plan of the research and the research processes that were followed in executing this study. These are discussed below.

3.2 RESEARCH DESIGN

Research design refers to the basic plan of the research designed to answer the research question (Babbie & Mouton 2011:75-77). According to Brink (2006:66), a research design includes the planning of the research procedure as well as the procedure for data collection and analysis. It further explains whether the research is descriptive or experimental in nature as well as specifying the target population to be included in the study (Joubert & Ehrlich 2010:77-78, 143). The current study was explorative and descriptive in nature. According to Polit and Beck (2008:66), an explorative research seeks to determine why certain phenomenon occur whether in society. Grove, Burns and Gray (2013: 215) asserts that a descriptive study designs are crafted to gain more information about characteristics within a particular field of study. This therefore justifies the reason a choice of explorative and descriptive research was made in this study to explore and describe the eating habits and nutritional behaviours in adolescents.

A qualitative, exploratory and descriptive research design was used to explore and describe eating habits and nutritional behaviours in adolescents (Babbie 2007:92). Qualitative research is a systematic, interactive, subjective approach used to describe life experiences and give them meaning (Creswell 2009:89; Bowling 2009:380; Brink 2006:113). The researcher followed a systematic approach to learner's subjective accounts of nutritional behaviour though flexible and unstructured methods of inquiry

(Bowling 2009:380). The qualitative method is an appropriate method as it allowed collection of diverse experiences and views of adolescents eating habits and food behaviours. According to Holloway (2005:01), qualitative research can be an important tool in understanding the emotions perceptions and actions of people who suffer from a medical condition. Joubert and Ehrlich (2010:318), concur by stating that it is out of these perceptions and social influences that that behaviour, including health-related behaviour, is born.

Furthermore, Holloway (2005:1) stipulates that the reasons for particular types of behaviours can only be understood when it is observed and people are asked about it. Therefore health or education policies can be developed through this type of research; policies for changing health behaviour can only be effective if the reasons for this behaviour are clearly understood (Creswell 2009:99).

3.3 RESEARCH METHODS

Research methodology refers to the practices and techniques used to sample the population size and how data was processed and analysed (Vaus 2001:143). According to Polit and Beck (2012), a research methodology may be defined as academia's established framework for the collection and evaluation of existent knowledge for the purpose of arriving at, and validating new knowledge. Also, the importance of research methodology emanates from its definition of the activities of a specified research, its procedural methods, and strategies for project measurements and criteria for research success:

According Denzin and Lincoln (2011:3), qualitative research focuses on the interpretation of phenomena in their natural settings to make sense in terms of the meanings people bring to these settings. It is effective mostly when gathering data that involves the values, behaviours and opinions of a particular population (Polit & Beck 2008:12). Creswell (2009:44) defined qualitative research as attempting to understand the unique interactions in a particular situation. The understanding of these interactions includes the understanding in depth of the fine characteristics of the situation and the meaning brought by those involved and the activities around them at a given time. Therefore, this implies that qualitative research models an inductive process, assumes the mutual, simultaneous shaping of factors, maintains an evolving design in which

categories are identified during the research process, and is characteristically 'context bound' (Creswell 2009:44). This further explains that qualitative research reveals the actual feelings of the population with regard to any phenomenon that may be affecting their lives at any given moment. Thus, this kind of research has an element of self-proclaimed truths by the participants in the research study. It is upon this background that a qualitative research method was pursued in this study and focus groups was used as an instrument to explore and describe eating habits and nutritional behaviours in adolescents.

3.3.1 Sampling

3.3.1.1 Population

Study population or a target population is all possible individuals, objects or artifacts making up a group of interest from which the sample is drawn (Botma, Greeff, Mulaudzi & Wright 2010:274). For this study, the population was purposively selected from Johannesburg south district which is one of the fifteen school districts within the province. In this study the names of the school and the participants are anonymous. The elements comprised of consumer studies learners. The study was restricted to a public school that is within the Gauteng Department of Education.

3.3.1.2 Sampling

Sampling in this study is by way of non-probability (Babbie 2007:166). The purposive sampling procedure was used to select the participants. According to Holloway (2005:110), purposive sampling strategy is designed to gather a depth and richness of the experience.

Furthermore, purposive sampling is a deliberately non-random method of sampling, which aims to sample a group of people, or setting, with particular characteristics, usually in qualitative research design (Bowling 2009:208; Joubert & Ehrlich 2010:26). According to Joubert and Ehrlich (2010:101), this form of sampling allows for selection of key or typical individual from the spectrum in which we are interested, this sampling is appropriate for a focus group or for in-depth interviews.

Babbie (2007:292-293) suggest that focus groups should consist of between six to twelve participants. The decision about size of the group should be guided by two considerations. It should not be as large as too unwieldy or to preclude adequate participation by most members nor should it be so small to provide substantially greater coverage than that of an interview with one individual (Grove, Burns & Gray 2013:275). The focus groups were conducted with adolescents aged between 16 and 18 years old at a secondary school in Lenasia South. The first group consisted of female learners, second group was composed of male learners and the final group was a combination of both female and male learners to produce a heterogenic group. The focus group was conducted during the school intervention period after school.

The participants were asked for their consent. Adolescents who returned signed parental consent forms and gave written assent to participate were included in the study. Learners aged between 15-18 years in grade 10-12 doing consumer studies at a secondary school in Lenasia were included in this study. The exclusion criteria were adolescents that were not doing consumer studies, and also adolescent in grade 10-12 but above 18 years and final those learners who fulfil the inclusion criteria but not wishing to take part were excluded.

3.3.1.3 Ethical issues related to sampling

According to Botma et al (2010:13), the principles of justice, namely the fair section and treatment of participants, apply to the sampling process. Selection of participants (sampling) should be based on reasons directly related to the research and not because people are easily accessible. No abuse or exploitation based on race, religion, gender, age, class or sexual orientation may occur (Moule & Goodman 2009:57). The flipside of the coin is that no group or individual may receive preferential treatment, and become research participants because the researcher likes them or wants them to participate.

3.3.1.4 Sample

A sample is a subset or portion of accessible population identified for the study while sampling is the process of selecting the subset or portion of the population to represent the population to represent the accessible population (Babbie 2007:211). The most

important consideration of the sample is its representativeness, meaning that the characteristics of the sample approximate or are comparable to those of the population (Polit & Beck 2008:340). If the sample is representative, conclusions can be drawn about the population from which the sample has been chosen.

With purposive sampling, researchers rely on their experiences and ingenuity to deliberately obtain units of analysis in such a manner that the sample they obtain may be regarded as being representative of the relevant population (Polit & Beck 2008:343). The sample chosen by the researcher is a representative of the population because public schools have a learner population of diverse ethnic groups and backgrounds that represent the wide social South African spectrum of learners.

Since the sample sizes formulas cannot be used for non-probability samples, the determination of the necessary sample size is usually a subjective, intuitive judgment made by the researcher based on past studies (Grove et al 2013:371). Webb (2002:59) is of the view that sample size primarily depends on the degree of accuracy that is needed, i.e. the sample must be representative of the population with respect to the characteristics/variables of interest. The accuracy depends upon two characteristics of the population namely:

The degree of variability in the population: populations which have high degrees of heterogeneity require large sample sizes than populations which are homogenous. The presence of population subgroups: the sample must be large enough to allow for valid analysis of any subgroups that may be present in the population. Polit and Beck (2008:349) further asserts that one of the methods used by researchers is to determine the sample size similar studies in the past.

3.3.2 Data collection

3.3.2.1 Data collection approach and method

The data was collected by means of depth focus group interviews as the focus groups gave adolescents the opportunity to discuss their opinions, understanding, and needs in more detail than typically allowed in traditionally survey (Brink 2006:152). Focus groups aimed at highlighting the participants' attitudes, priorities, language and framework of

understanding and to encourage research participants to generate and explore their own questions and develop their own analysis of common experiences and also to encourage a variety of communication from participants-tapping into a wide range and form of understanding (Holloway 2005:67). Joubert and Ehrlich (2010:26) point out that focus groups can help to build community involvements in the research or intervention being evaluated or planned but it major advantage is possible peer pressure within the group, which may prevent the members from saying what they believe.

The purpose of focus group interviews is to develop a broader and deep understanding rather than a quantitative summary. The emphasis is on insight, responses and opinions (Babbie 2007:292). Multiple groups are recommended since each discussion is highly influenced by the participants and consequently three sessions, with different participants were held (Grove et al 2013:275).

3.3.2.2 Development and testing of the data collection instrument

A pilot study was undertaken prior to the formal research being conducted. A pilot study, as defined by Joubert and Ehrlich (2010:50), refers to a mini-study which tests part(s) of the study. The number of participants may vary and is left at the discretion of the researcher. Pilot studies have several purposes, however, with regards to this study, it served as a final test of research procedures prior to beginning data collection. The pilot study assisted in giving suggestions on how to improve clarity of the instructions, tested whether participants interpreted things as intended and helped in developing probes (Grove et al 2013:343). The pilot study also helped in giving the researcher an indication of how much time is required for the research. The pilot study comprised of individuals of the same age as the participants but they were not included in the bigger study.

3.3.2.3 Characteristics of the data collection instrument

According to Krueger and Casey (2009), focus groups interviews typically have six characteristics or features. These characteristics are discussed below:

- **The focus groups involve people**

Focus groups are typically composed of 6 to 10 people, but the size can range from few as 4 to as many as 12. The size is conditioned by two factors: It must be small enough for everyone to have opportunity to share insights and yet large enough to provide diversity of perceptions.

- **Focus groups are conducted in a series**

The focus group interview is conducted in a series. Multiple groups with similar participants are needed to detect patterns and trends across groups. Solo focus groups are risky because occasional moderators will encounter "cold" groups in which participants are quiet and seemingly reluctant to participant. Furthermore, focus groups can be influenced by external or external factors that may cause one of the groups to yield extraordinary results. These features or other may not be apparent to the researcher and the effect on the focus groups can be enormous. The prudent strategy is to plan focus groups in a series (Krueger & Casey 2009).

- **Participants are reasonably homogeneous and unfamiliar with each other**

Focus groups are composed of people who are similar to each other. The nature of homogeneity is determined by the purpose of the study and is a basis of recruitment. This homogeneity can be broadly or narrowly defined. Focus groups have traditionally been composed of people who do not know each other − for years it was considered ideal but more recently; however, researchers are questioning the necessity and practicality of this guideline, especially in community-based studies. The concern about familiarity of participant is really an issue of analysis. The analyst is unable to isolate what influenced the participants (Krueger & Casey 2009).

- **Focus groups are data collection procedure**

Focus groups produce data of interest to researchers. In this respect the purpose differs from other group's interaction in which the goal is to reach consensus, provide recommendations, or make decisions among alternatives. Focus groups however, pay

attention to perceptions of the users and consumers of solutions, products, and services.

- **Focus groups make use of qualitative data**

Focus groups produce qualitative data that provide insights into the attitudes, perceptions, and opinions of participants. These results are solicited through open-ended questions and a procedure in which participants are able to choose the manner in which they respond and also from observations of those participants in a group discussion. The focus group presents a more natural environment than that of an individual interview because participants are influencing and influencing and influenced by others. The researcher serves several functions in the focus group: moderating, listening, observing, and eventually analysing, using and inductive process. The inductive researcher derives understanding based on the discussion as opposed to testing or confirming a preconceived hypothesis or theory (Krueger & Casey 2009).

- **Focus group have a focused discussion**

The topics of discussion in a focus group are carefully predetermined and sequenced, based on an analysis of the situation. This analysis includes an in-depth study of the event, experience, or topic in order to describe the context of the experience and the ingredients or components of the experience. The questions are placed in an environment that is understandable and logical to the participant. The moderator uses predetermined, open-ended questions. One unique elements of focus group is that there is no pressure by the moderator to have the group reach consensus. Instead, attention, is placed on understanding the thought processes used by participants as they are consider the issues of discussion (Krueger & Casey 2009).

3.3.2.4 Data collection process

- **Focus group interviews**

The three focus groups interviews were conducted with 33 students taking part in the study, and who were grade 10-12 learners. The first group was composed of female learners, second group was composed of male learners and the final group was a

combination of both female and male learners in order to produce homogenous groups. The student group was composed of an average of 11 students. Homogeny in grade and small group size was intended to enhance the adolescents' comfort in discussing their personal perspectives and experiences among classmates and to encourage full participation by all members of the group (Joubert & Ehrlich 2010:26; Holloway 2005:61).

All students in Grade 10-12 were made aware of the option to participate in the focus group by their form class teacher. The focus group was conducted during the school hours. Open ended questions were used to solicit information about the adolescents eating habits and nutritional behaviours (Brink 2006:1850). Focus groups interviews took about one hour fifteens to about forty minutes and time depended on the group composition. The focus groups interviews were audio taped and transcribed verbatim (Holloway 2005:66).

On commencement of the interviews all participants were thanked for their involvement. They were assured that their input was appreciated and that no reference would be made to them as individuals. They were encouraged to speak their minds and not to be out off by differing opinions.

3.3.2.5 Ethical considerations related to data collection

The three principles, namely respect for people, justice and beneficence, are applicable during the data-gathering phase. Respect for people is demonstrated by maintaining anonymity and confidentiality. Anonymity means that even the researcher does not know to whom responses belong. Anonymity cannot be achieved in qualitative studies because qualitative data-gathering techniques involve face-to-face techniques such as focus groups interviews. Confidentiality pertains to how you manage personal information to ensure that only the researchers directly involved in the study have access to the information and that information is not willingly or unintentionally shared with other people unless the person whose confidence.

Consent to carry out research was sought from the department of principal of the school, department of education, parents or guardians, learners who participated in this research (Annexure B). Adolescent participation required student assent and written

parent consent (Holloway 2005:65). The researcher was responsible for providing accurate information; which was done by setting ground rules prior to the session and through debriefing.

The likelihood of possible risks of the participants was unlikely. The researcher was of the opinion that no possible harm and risk could occur to the participants, however, the researcher informed the participants of free counselling session if needed.

The researcher obtained approval from Higher Degrees Committee in the Department of Health Studies and the researcher also abided by the rules and regulations of UNISA regarding to copyright and other legal and technical aspects of research as spelt out in UNISA Statue (Annexures A and C).

Permission to carry out research was sought two months in advance from Gauteng Department of Education, in line with Knowledge, Management and Research Directorate's permission "in Principle". Permission was sought from parents of the learners (Annexure B). Provisions of the Knowledge Management and Research Directorate (KMR) of Gauteng Department were strictly adhered to by the researcher. KMR spells out the legal framework research have to observe and goes to list the all the legal status that include constitutional rights of Republic of South Africa (1996) (Act of No. 108 of 16), as amended.

3.3.3 Data analysis

According to Brink (2006:185), manual analysis involves a thorough review of all recorded information that the researcher has obtained during the course of the data collection and coding involves inventing and applying a category system. Content analysis: two steps method was used to analyse data. According to Brink (2006:185), content analysis is a technique for making inferences by systematically and objectively identifying special characteristic of messages. From this perspective, video tapes, or any item that can be made into text are amenable to content analysis (Henning 2009:127). Data was analysed from transcripts derived from the audiotapes of the focus groups via an interactive process, the concept, categories, and themes that arose were identified to develop an understanding eating habits and nutritional behaviours of

adolescents (Holloway 2005:1520; Creswell 2009:185; Brink 2006:185; Babbie 2007:338).

Content analysis will be guided by the objectives of the research, to explore the eating habits and nutritional behaviours of adolescents and how the school environment may influence healthy eating in adolescents. Transcribed interviews were read and word codes were assigned to the text. Data will then be categorised into headings that arose from coding (Joubert & Ehrlich 2010:115; Holloway 2005:181). These include the eating habits and nutritional behaviours of adolescents and how the school and home environment may influence healthy eating in adolescents. To enhance validity of the categories, and to guard against researcher's bias, a colleague was asked to generate categories independently. The list of categories was adjusted where necessary. Data from different sources were triangulated to further enhance validity. The main themes that emerged were summarised and illustrated with direct quotes from the focus groups.

A two–way content analysis method was employed: general content coding and specific content coding (Berg 1998).

Coding phase 1: General content coding. The aim of the first coding phase was to present a broad framework for analysis, organise responses by content area and omit irrelevant dialogue not applicable to the research questions. Transcripts were read carefully for overall content and identification of major categories. A master coding template was developed around the major categories that emerged from the groups, including eating habits and nutritional behaviours of adolescents and the barriers of eating healthy and the importance of healthy eating to adolescents to prevent the onset of non-communicable diseases. Based on this master template, a separate coding template was created for each focus group with statements and phrases from transcripts placed directly into the coding template according to the established content areas. Comments or phrases that fit in more than one category were placed under each appropriate category on the template. This phase of coding was done by two graduate students who assisted in moderating the focus groups. Revisions in the coding system and in coding styles were made until a high degree of inter-rater reliability (97%) was attained.

Coding phase 2: Specific content coding. The aim of the specific content coding phase was to identify major themes regarding adolescents' eating habits and nutritional behaviours. Transcripts and coding templates for each of the 3 focus groups were read and categories of interest were highlighted to create a summary of the group. Each synopsis was reviewed carefully for relevant themes. Recurring themes in a particular group were coded only once per group as the objective was to gather information regarding the opinions of each group, not the number of times a particular theme was mentioned. An overall grid was then established that allowed for examination of the codes and themes across and within groups. Of interest was the number of groups in which the theme was expressed, with particular attention given to themes communicated by the majority of groups. The goal was to gain a sense of overarching concepts cross-cutting the groups.

3.4 ACADEMIC RIGOUR OF THE STUDY

3.4.1 Trustworthiness

According to Brink (2006:118), reliability is concerned with the consistency, stability and reliability of the informants' account, as well as the researcher's ability to collect data and record information accurately and further explains that validity is concerned with the accuracy and truthfulness of scientific findings. In qualitative research, credibility and authenticity refer to internal validity. The researcher used the following techniques to achieve credibility:

- Used a variety of sources in data gathering-triangulation in which the researcher used other researchers in order to increase the validity of the study. During analysis stage, feedback from other researchers was compared to determine areas of agreement as well as of divergence Focus group discussions and observations during data collected enhanced triangulation.
- Peer debriefing, in which the researcher exposed herself to a peer who probed the researcher's bias, explored meanings, and clarified the bases for particular interpretations (Holloway 2005:277)
- Authenticity was established by context-rich and meaningful, or "thick", descriptions (Brink 2006:119; Holloway 2005:277).

3.4.2 Transferability

External validity, which is defined as the degree to which the results of a study can be generalised to other setting or samples, is usually referred to as “transferability” and/or “fittingness” in qualitative work (Polit & Beck 2008:246). It is ensured by providing a thick description of the purpose sampling techniques, the research design and findings. External validity was obtained by ensuring that all data collection process focused on the objective of the study. The research process has been documented in detail, thus enabling potentially interested parties to determine whether our results are transferable to other settings.

3.4.3 Dependability

Dependability is a further criterion listed by Lincoln and Guba (1985) to establish the trustworthiness of the study. This requires an audit. The enquiry auditor − generally a peer − follows the process and procedures used by the researcher in the study and determines whether they are acceptable, that is, dependable (Brink 2006:119).

Following each focus group, the researcher and a colleague met to debrief and summarise each focus group; detailed minutes were recorded. Any biases were voiced, recorded, and considered to ensure that the analyses were not influenced by researcher bias. Detailed information was documented for the purpose of an audit trail.

3.4.4 Confirmability

Confirmability guarantees that the findings, conclusions and recommendations are supported by data and that there is internal agreement between the investigator’s interpretation and the actual evidence. This was also accomplished by incorporating an audit procedure.

The researcher with the help of a colleague performed inductive content analysis. Upon completion of independent coding, the two researchers compared their analyses. Data were examined for similarities and differences across the interviews, and emerging themes were identified, a summary of the analysis was prepared and discussed. To enhance the confirmability of the study, my colleague independently reviewed all three

transcripts and the two researchers were engaged in peer-debriefing sessions; this was a final step in the analysis and interpretation.

3.4.5 Internal validity

According to Holloway (2005:277), in qualitative inquiry internal validity- truthfulness and representation of the reality of the participants is most important. The research did not only do the member check (Holloway 2005:277) but l also demonstrated validity through thick descriptions as it portrays the reality of participants in a holistic way. Validity was also shown through an accurate and detailed descriptions of the audit trail − the record of decision-making during the research process (Holloway 2005:277). In peer reviewing the researcher discussed the interpretations and conclusions of the findings with a peer who is not involved in the study. A record was kept of the participants' agreement that the researchers understood what was said.

3.5 CONCLUSION

This chapter delved profoundly into the reasons why qualitative design was chosen. A critical look as also made into a data collection in terms of sampling, how the data will be collected through focus group interviews. The chapter also illustrated how data would be analysed through manual analysis.

The mid-section of the chapter provided a brief description of validity and reliability in qualitative research. The chapter went further to address reliability of the inquiry, starting with internal consistency increased through the choice of data collection method that terminates human deception and subjectivity on the part of the participants. External consistency of the research was increased through rich thick descriptions.

CHAPTER 4

ANALYISIS, PRESENTATION AND DESCRIPTION OF THE RESEARCH FINDINGS

4.1 INTRODUCTION

The preceding chapters provided an introduction and background, research design and methodology. In this chapter the data gathered formed the empirical evidence of the research which is then presented and analysed so that interpretations can be made. The chapter begins with a discussion on the composition of the research sample, providing a description of the three focus groups that were involved in the investigation.

The exploratory research on eating habits and nutritional behaviours in adolescents resulted in key themes being identified by the researcher. The researcher will simply report key findings under each main theme or category, using appropriate verbatim quotes to illustrate those findings and incorporate the discussion into the findings chapter.

4.2 DATA MANAGEMENT AND ANALYSIS

4.2.1 Data handling procedure

In this research Creswell's analytical spiral has been integrated with the processes of Marshall and Rossmann (in De Vos 2005:334) to form a set of guidelines given as shown in table 4.1.

Table 4.1: Creswell's analytical spirals

Implementation of guidelines	
Planning for the recording of data	This included planning before the commencement of data collection. The researcher planned when and where interviews would take place.
Data collection and preliminary analysis	Data was obtained from three focus groups. Focus groups discussions were recorded and field notes utilised to enhance the data collected.
Managing or organising the data	Once the focus group was completed, the data was transcribed from the recordings. These transcribes were organised by storing it on a computer.
Reading and writing memos	Transcripts were read several times in order for the researcher to familiarise herself with the given data on the eating habits and nutritional behaviours in adolescents. All information not applicable to the aims of this study was cut from the transcripts.
Generating categories, themes and patterns	Recurring themes were generated from the recorded data. The researcher made notes on recurring themes and so formed categories to which the themes could be assigned.
Coding the data	Data was coded according to a recurring theme. The researcher made use of different colours in order to highlight and code information.
Testing the emergent understandings	This stage allowed for the researcher to challenge findings amongst the data. This stage also incorporated the evaluation of data for its usefulness.
Searching for alternative explanations	As themes and categories on eating habits and nutritional behaviours in adolescents arose from the study, the researcher challenged themes and categories by searching for any other plausible explanation for the findings.
Representing, visualising (writing the report)	In this final stage the researcher presented the data on the eating habits and nutritional behaviours in adolescents in a suitable, understandable form.

(Marshall & Rossmann in De Vos (2005:334)

4.2.2 The pilot study

A pilot survey was conducted, prior to the actual survey, the pilot study assisted in giving suggestions on how to improve clarity of the instructions, tested whether participants interpreted things as intended and helped in developing probes. The pilot study also helped in giving the researcher an indication of how much time is required for the research. The pilot study comprised of individuals of the same age as the

participants. The researcher requested the participants to share their thoughts about the questions, their answers and any shortcomings in interview guide.

4.3 RESEARCH RESULTS

4.3.1 Sample characteristics

4.3.1.1 Composition of the study

There were 33 participants in total, with the male participants (n=18) enjoying a much larger representation than the female participants (n=15) in the total sample as well as within each of the three focus groups. The learners who participated in this study were purposively selected came from a high school in Johannesburg South District 11. A description of the composition of the three selected focus groups follows:

Focus group one was comprised of thirteen participants (n=13) all of the participants were male learners. Eight of the participants were in grade 11 and five participants were in grade 12. Group two consisted of 10 participants (n=10) of which all of the participants were female. Group three was composed of 5 males and 5 females participants (n=10). All participants lived in Lenasia South or the surrounding area.

4.3.1.2 The age of the participating learners (n=33)

The ages of the learners who are participating were also taken into consideration in this study and the ages are given in detail in figure 4.1.

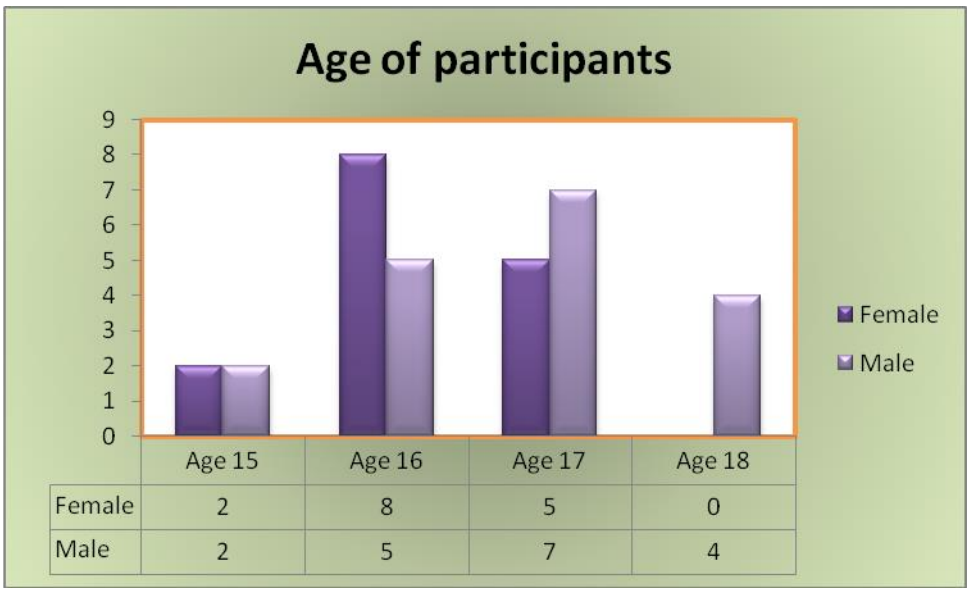


Figure 4.1: Age of participants (n=33)

Figure 4.1 shows that the learners who participated in this study were 33 (15 female learners and 18 male learners. Two girls and two boys were only 15 years of age, Eight Females and 5 males were aged 16 years old, 5 females and 7 males were aged 17, and only 4 were 18 years of age.

4.3.1.3 Number of participants per gender (n=33)

Figure 4.2 below shows that group1 was composed of 13 males, group was composed of 10 females and group 3 was composed of 5 males and 5 females.

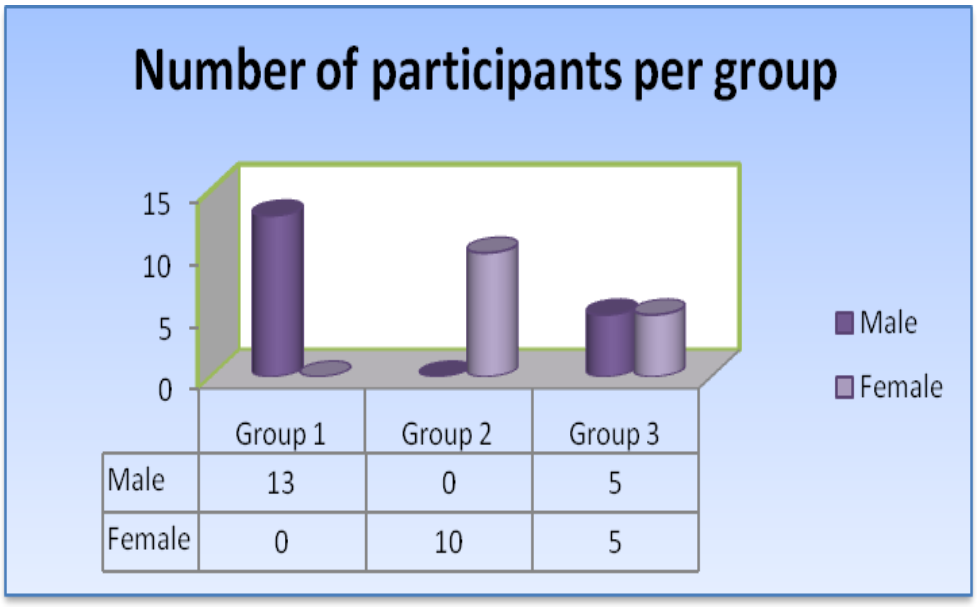
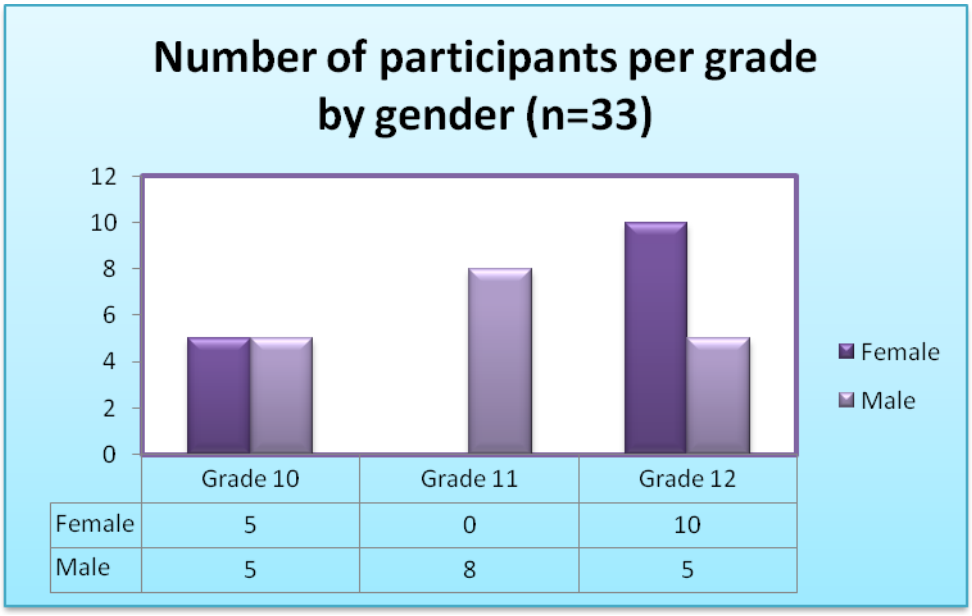


Figure 4.2: Number of participants per group (n=33)

4.3.1.4 Number of participants per grade by gender (n=33)

The learners who were purposively selected are shown in figure 4.3 below.



	Grade 10	Grade 11	Grade 12
Female	5	0	10
Male	5	8	5

Figure 4.3: Number of participants per grade by gender (n=33)

Figure 4.3 above shows that grade 10 learners who participated in this study were 10 of which 5 were males and 5 were females. Among grade 11 they were a total of 8 all of them boys. Participating grade 12 were 15 and comprised of 10 females and 5 male learners.

4.3.2 Prior knowledge of participants about eating habits, nutritional behaviours in relation to non-communicable disease

Most adolescents had an idea what eating habits were, and they related eating habits as eating healthy foods and unhealthy foods. Hot chips, kota, pies, fat cakes and burgers where perceived as unhealthy. Two learners commented:

> *Eating habits is how people tend to eat something on regular basis for example eating kotas, pies, bunny chow during lunch at school, etc.*

> *"Eating habits is eating healthy or unhealthy, something that you do on regular, eating one kind of food on a regular basis and never change*

To a certain extent students seemed to be conscious of what is good for their health, what they should be eating and should not be eating. One learner explained:

> *Eating a pie late at night after meals, is not healthy normally it leads to obesity.*

However, this knowledge did not encourage or coerce them to change their eating habits. One learner remarked,

> *My eating habits changed for the worst, now I eat like a horse, eat a lot but it is not a problem at all, I will continue with my eating habits whether good or bad.*

In general, adolescents were cognisant of the effects of poor and unhealthy nutritional habits and behaviours. Nevertheless, they indicated affection for “unhealthy food” so much that they could not resist it, even though they were aware of its poor nutritional value. Two learners commented,

> *Too much food leads to obesity, my eating habits changed I used to weight 51 kg and now I am 96 kg but I like what I eat.*

> *Anaemia is caused by not drinking a lot of water making our liver die.*

However, some adolescents were aware of potential diseases but unsure of the real causes. Eating healthful food was not a priority for most of the learners as most of the learners were not prepared to adjust or alter their eating habits and nutritional behaviours. Adolescents preferred junk food to healthier foods such as fruits and vegetables as they did not taste good as other options. One learner commented:

> *People must eat healthy exercise and not eat junk food but junk foods tend to attract people, you cannot stay away from it, I like my eating habits will not change.*

On learner pointed out:

> *I will change my eating habits, eating pie and late at night meals, it is not healthy, normally it causes obesity.*

In spite of most adolescent having adequate knowledge of healthy eating recommendations, findings from previous research and the current study show that youth have little concern for healthy eating during adolescence (Kroll et al 2001: 197). In addition, a survey in a Tasmanian high school showed that learners' perception of food being healthy had little influence on consumption of food (Kroll et al 2001:197).

4.3.3 Common adolescents eating habits and behaviours

The adolescents indicated that it is very difficult to adopt the proposed healthful eating practices entirely, even though they recognise that this would be beneficial for their health. Both boys and girls pointed their common eating habits. The common eating habits discussed more frequently and extensively were snacking, skipping meals, family meal, high consumption of sugar, sodium, fatty foods and sweetened beverages and low intake of vegetables and fruits.

4.3.3.1 Snacking

The bulk of the adolescents under study consumed at least two or more snacks a lot during school hours. Overall, adolescents pointed out that they preferred snacks that were high in sugar, sodium, fats, while relatively low in vitamins and minerals. Furthermore, adolescents at the school had a propensity to snack instead of having proper meals. The most popular snacks included bread (quarter with fried chips, Russian sausage, polony, cheese or burger and different types of sauces), hot chips, sweet biscuits, cakes, chocolate and cool drinks. Two students commented:

> *I usually eat different types of snacks which I bring from home, crackers, kip kip, scoppers and amabhujwa, chocolate and biscuits and sometimes buy quarter, red cake and I litre coke from tuck-shop.*

> *I drink cool drink anytime of the day, my eating habits changed when I got to high school may be that is the reason why weight increase from 51 kg to 96 kg.*

The finding of this study was similar to the studies reported by Stang and Story (2005) who affirmed that 88% of adolescents consume at least one snack per, furthermore,

stated that the snacks account for 22-33% of the daily energy intake among adolescents. The current study also established high consumption of soft drinks compared to other beverages which is in line with (Verstraeten et al 2014) findings that adolescents tend to snack on snacks high in sugar, as soft drinks are the mostly common chosen snacks among adolescents and account for about 35% of the total calorie intake. Stang and Story (2005) further state that this high consumption of soft drinks increases the risk for bone fractures over an individual's lifetime. On the contrary the studies conducted by Gharib and Rasheed (2011:62) have shown that eating patterns which include snacking may help meet the adolescents' nutritional needs.

4.3.3.2 Skipping meals

The lifestyle of the studied adolescents is within the standard recommended for their age although there is a tendency to skip breakfast, there was an inclination towards more learners skipping breakfast (defined as not having breakfast at all except over weekends). Adolescents communicated a range reasons for skipping breakfast which included lack of time, desire to sleep longer in the morning and lack of appetite. One learner commented:

> *I personal skip breakfast in the morning because I do not have time to prepare and eat, so I eat snacks. For lunch I bring a lunch box otherwise, if not I buy junk food.*

Previous South African studies have reported that skipping breakfast by adolescents ranges from 13% to 22% depending on the ethnicity and geographic location. In the USA, similar proportions of boys (11%) and girls (14%) ate breakfast zero to twice per week (Feely et al 2012:5). Furthermore, 31% of 14 to 18 year old boys and girls skipped breakfast in the previous week. On the contrary the current study showed a higher level of breakfast skipping, particularly by adolescent boys. One boy commented:

> *I normal skip breakfast because I am always busy in the morning.*

Lunch was skipped by most learners, as with breakfast skipping lunch reduces intakes of energy, and healthy foods, and other nutrients (Feeley et al 2012:e2). Adolescents

who skip meals should be counselled on convenient, portable, and healthy food choices that can be taken with them and eaten as meals or snacks. One learner remarked:

> *I do not bring packed lunch, if there is no money to buy, I just skip lunch, I stopped going to the feeding scheme a while ago.*

4.3.3.3 Family meal

The findings in the current study indicated great diversity in the frequency of family meals on a regular basis in adolescents' homes. Some adolescents conferred about having family meals on a regular basis in their homes. Other adolescents said family meals occurred very seldom in their homes, largely due to busy schedules of teens and their parents. Some adolescents talked about eating in the living room with their family while watching TV, and still others described taking food up to their bedrooms and eating alone. A similar variability in family eating patterns was also found in the survey data of Project EAT as well as (Neumark-Sztainer, Hannan & Perry 2003). One learner explained:

> *I eat alone in my bedroom; it's only me and my brother, so we always avoid each other.*

Dinner was the most frequently consumed meal among the adolescents. Two learners remarked:

> *We normally eat dinner together because; we normally have pap and sometimes sausages and vegetables like spinach when available.*

> *We do not normally eat together because my mother is a nurse, works shift but when she is at home we to eat together and she forces us to eat vegetables because she is diabetic.*

It was interesting to note that the third of the families who tended to eat together had vegetables as part of their meals; the down side was that the adolescents chose not to eat them. Educational and public health initiatives aimed at promoting shared family mealtimes may improve the nutritional health of children and adolescents. Some studies

have suggested that family meals may protect against nutritional health-related problems during childhood and adolescence, including overweight, unhealthy and disordered eating (Stang & Story 2005; Gharib & Rasheed 2011:62). But findings have been mixed, with some studies reporting strong relations to health outcomes while others have reported no relation. One learner commented:

> *For supper I eat what is available but normally we eat rice, pap, meat, samp and no vegetables, only eat vegetables over the weekend but chose not to eat them.*

The current findings are affirmed by Gillman, Rifas-Shiman, Frazier, Rockett, Camargo, Field, Rocekett, Berkey and Coditz (2000:236) study where they compared food and nutrient intakes of 9-14 year olds who ate family dinner together and to those who never ate together. Gillman et al (2000:236) confirmed that family meals are associated with better overall dietary quality among children and adolescents. Furthermore, Gillman et al (2000:235) stated that not only does increasing frequency of the family dinner was associated with more healthful dietary intake patterns, including more fruits and vegetables, less fried food and soft drinks, less saturated fat and trans fats and more fibre and micro-nutrients from food but also provided an opportunity for family communication and interaction as one learner remarked:

> *We eat together, and have a nice conversation, just enjoy spending time together as a family.*

One learner explained:

> *At home we eat breakfast and supper together; we tend to have lots of vegetables and my mother forces us to eat them.*

4.3.3.4 Non-traditional eating patterns

Adolescents tended to skip meals or substitute proper meals to non-traditional meals. Two learners mentioned:

> *I never miss breakfast, but have sweets … a bunch of them …. I will change my eating habits to a vegetarian.*

I real do eat breakfast and it consist lots of sweets, I mean a lot of them.

The traditional family meal is becoming less important in the dietary patterns of adolescents. Similar to previous research in adolescents, participants in this study substitute the traditional family breakfast meal to non-traditional meals such as sweets (Stang & Story 2005).

4.3.4 Adolescents perceived barriers to healthful eating habits and nutritional behaviours

In general, adolescents know what they should and should not be eating. In focus groups with adolescents, the following five themes emerged as major barriers to improving their diets. The most appropriate quotes were chosen to illustrate each (sub) category

4.3.4.1 School environment: (tuck-shop)

The most frequently cited barrier to healthful nutritional behaviours by adolescents was the quality of the food served at the school tuck-shop. Many adolescents condemned the food offered at the school tuck-shop as greasy and high in fat. Learners felt that there was a lack of healthy options and would prefers to have more fruits and vegetables in greater quantity and quality, they would chose to eat them instead of the less nutritious snack food. One learner commented:

I do not buy from the tuck-shop because it is not clean; they hold greasy chips by their bare hands, I buy pie, snacks sweets from cars.

Food availability at school was viewed by adolescents as a key factor influencing their consumption, that is, they eat what is available. Adolescents bought what was available at the school tuck-shop and from other vendors appointed by the school. Adolescents were well aware of the presence of these non-nutritious snacks and the influence they have on the meal choices. The adolescents said they will not often eat a nutritious lunch and instead select chips, fat cakes, stock sweets, carbonated soft drinks especially coke, biscuits, scoppers, crackers, red cake, chelsea buns and sweets. The

study established that the tuck-shop sold food that was high in high in fat, sugar, saturated fat and sodium. Although some adolescents felt that some of the learners would not eat the healthy foods even if they were available, the majority of the learners said they would choose nutritious foods over the snacks at lunch time if they were more readily accessible and palatable. Some learners explained that food available at the tuck-shop is the reflection of adolescences' preference for processed food. However, some participants believed that if fresh fruit looked appealing, was ready- to- eat and sold at acceptable price then adolescent would be more willing to buy it. To improve nutritious options in the tuck shop, one learner recommended:

> *The principal should improve the school tuck-shop, tuck-shop supplies kota, chips and chocolate, we need healthy foods like, brown bread, we always by pies because the options are limited.*

Experimental studies by LacCaille, Dauner, Krambeer and Pedersen (2011:537) and French, Jeffery, Story, Breitlow, Baxter, Hannan and Snyder (2001:112) have demonstrated that reducing the cost of healthier foods, particularly fruits and vegetables, increases their purchase. Schools could simultaneously increase the cost of unhealthy food items in order to promote healthier eating. All of these changes could result in making healthy alternatives the default options.

4.3.4.2 School environment: Physical activity

Adolescent were not exposed to any physical activity at school, after being exposed to such amount of junk food. Sports and extra curriculum activities are not offered at school but used to play soccer. Learners showed interest in sporting activity but the school is academic oriented and no sporting activities are offered. One learner recommended:

> *The sporting activities should be re-introduced to the school, so to help us keep fit.*

According to Akman, Akan, Izibrak, Tanriover, Tivel,Yildiz, Tektas, Vitrinel and Hayran (2010:67) adolescence is a period in which overall physical activity decrease and activities requiring less physical effort are becoming more

dominant. Furthermore it is recommended for school age children to have more than 60 minutes of physical activity per day. However, most of the participants of this study reported that they do not attend sport activity regularly. The findings of this study is in line with 2002 international Health Behaviours in school-aged Children study (A WHO Collaborative Cross – National Study), conducted in 35 countries, which showed that two thirds of adolescents do not reach the recommended level of physical activity, that, is at least 60 minutes a day, 5 days a week (Bak-Sosnowska & Skrzypulec-Plinta 2012: 2466).

4.3.4.3 School environment: Feeding scheme

The school offers a feeding scheme programme, which offers lunch to learners at the school as the school's majority of learners come from surrounding disadvantaged areas such as Orange Farm and Fine town. The menu is composed of rice, samp, soy beans, milk, and fruits. Competing pressures in the school tuck-shop and the feeding scheme, however, undermine these efforts to encourage all learners to eat balanced meals at school.

The current study showed that adolescent learners were not interested in the food served at the feeding scheme for various reasons such as being afraid of what others might think if they ate from the feeding scheme, or possible being mocked by others. Even so, some adolescents felt confident and did not care what their peers or other people thought if they ate from the feeding scheme.

4.3.4.4 Habit strength: Risk perception

Most adolescent noted that that their food consumption was influenced by habit, which they reported has become less healthy since moving to secondary school. They identified the increased availability of "unhealthy food" and financial autonomy as main influences on their habits. Most learners did not change their eating habits and behaviours willingly but the availability of healthy or unhealthy habits influenced changes. Three learners commented:

> *My eating habits changed when I got to secondary school because in primary the tuck- shop used to sell fruits now this tuck shop only sells junk food.*

My eating habits have changed because I used to eat alone at primary school but now have to share with friends, I bring three slices of bread and money, sometimes I do not get full, or sometimes they pour too much salt which causes high blood pressure.

My eating habits and behaviours have not changed because I still carry a lunch box.

Even so, some of the adolescents who carried lunch boxes to school are still doing so. This finding affirms the findings made by Story et al (2002:S40) that past eating habits are a result of eating habits and nutritional behaviours created during child hood.

4.3.4.5 Self-efficacy

Many adolescents felt they would not succeed in eating healthily and associated this inability with lack of self-control and the abundance of tasty, yet ‘‘unhealthy food’’ at school and/or at home. Only a few adolescents indicated that they are or would be capable of eating healthily. Three learner s commented:

I will not change my eating habits because I like food evening if it causes obesity.

People must eat healthy exercise and not eat junk food but junk foods tend to attract people’” I like my eating habits will not change.
Will change eating habits, eating pie and late at night meals, it’s not healthy, normally it causes obesity.

Stang and Story (2005) point out that the central issue in adolescence is the establishment of identity, i.e., a sense of oneself as a unique individual. As a result many adolescents felt they did not have adequate self-discipline to eat healthy foods, since they had a strong preference for “junk foods.”

4.3.4.6 Time

Time was considered a barrier to adopting healthful eating practices for different reasons. The adolescents discussed the fact that because classes start very early, they have to leave for school very early and cannot spend any time on breakfast. When they do eat breakfast, they eat something quick. In addition, they discussed the fact that at the time when they are supposed to have breakfast they do not feel hungry. One learner commented:

> *We do not sit and eat together, because we are always busy, if need be everyone prepare his or her own food.*

In addition, the adolescents discussed the fact that "healthy" food entails a great deal of preparation, and they are not willing to sacrifice time to it. In addition, preparing healthful food is perceived as being an adult task. Foods that are already prepared and ready to eat or require minimal preparation are attractive to adolescents:

> *I am usually home alone, only eat lasagne because easy to prepare, also eat fruit yoghurt. I do not prepare vegetables but I do eat them.*

Krolner et al 2011:112 concur with this study findings that time appears to be crucial and adolescents accordingly reported to make a trade of between eating healthy and time. Furthermore, some studies show that adolescents preferred pre-packed food that was easy to get, to carry and requiring no preparation such as salty snacks, sweets, fast food and soft drinks (Krolner et al 2011:112).

4.3.4.7 Lack of availability/limitation of the budget

Adolescents only ate what was available at home, had no choice but had to eat what is available at home. Two learners commented:

> *For super I normally eat pap and fresh milk and normally there will be no fruits or vegetables.*

I eat soft porridge in the morning sometimes left-overs of the previous night. For lunch I eat from the feeding scheme, when I get home I do not eat anything, I wait for supper. We normally eat pap, fish, and vegetables except cabbage.

Two aspects of availability as a barrier to healthful eating were described. In one aspect, participants mentioned that the predominant foods available or accessible were fast foods and unhealthy foods such as chips and carbonated drinks. Several of the participants mentioned that even the schools serve unhealthy foods. The other side of availability that participants described was that healthy foods like fresh fruits and vegetables are not readily available, and what is available is too expensive.

The importance of availability was highlighted in ten studies that indicated that price influenced children's purchases and selection of fruit and vegetables in all country settings (Krolner et al 20011:197). Sedibe et al (2014: 118) suggests that the consumption of food such as fruits and vegetables seem to be driven by economic reasons as they tend to be unaffordable and not accessible due to limited household income.

4.3.5 Motivators for following healthful eating practices

The adolescents stated that the proposed healthful eating habits and behaviours could be adopted as long as the nutritional quality of the foods available at the school tuck-shop was improved because this would not only improve the adolescents' diet, it would also establish the pattern of consuming healthful foods regularly. In addition, they mentioned that although they may want to adopt healthful eating habits, they could not do so without the support of the whole family. One learner commented:

I used to carry a lunch box at school, consisting of a chicken sandwich, with cheese and 100% juice at primary school, but now I carry money which I usually use to buy junk food. I think parents should force us to carry lunch boxes and not give us money. Food we carry in lunch boxes is usually healthier.

The adolescents also suggested that the adoption of some healthful eating practices might be seen favourably if they were adopted by their peers so that these habits are practiced in a group and they are labelled as "normal" adolescents. Another issue

perceived to be a motivating factor was having information about diet and nutrition because it is considered an important tool for knowing how to better choose foods. They view themselves as potential educators for their parents if given the appropriate information to relay to them. Two learners recommended:

> *I was eating from the school feeding scheme since primary, until grade 9, I stopped because my friends do not approve, and that is why I end up skipping lunch. I think adolescents should be encouraged to eat from the feeding scheme because it provides better quality of food, not that it is for the poor.*

4.3.6 Recommendations by adolescents

Adolescents recommended that quality of food of the tuck-shop such as brown bread for sandwich, fruits and vegetables should be available. The tuck shop should improve on the health and hygiene of the premises. Adolescents should limit junk food in the diet and should be encouraged to eat from the feeding scheme. The school should introduce sporting activity at school. The feeding scheme should provide food that is colourful or appealing and tasty. Two learners recommended:

> *We should talk to the principal, so that he manages what is sold in the school tuck-shop.*

> *We need healthy food like brown bread for sandwich on the menu should be changed.*

> *The tuck-shop should sell pap, meat and vegetables.*

4.3.7 Discussion

Typical adolescent eating behaviours in high-income countries include snacking (usually energy-dense foods), skipping meals (particularly breakfast), and sweetened beverages, and a low intake of fruit, vegetables, and dairy products; such behaviours have been found to be associated with poor nutritional quality (Scully et al 2009:106). In South Africa, for example, individuals have a high exposure to fast foods because these foods are available from formal (commercial franchises) and informal (such as street vendors) outlets. Several specific common eating habits emerged from focus group

endorsing the importance of coming up with future effective prevention strategies of non-communicable diseases strategies.

First, participants associated eating habits as eating healthy or unhealthy foods, rather the quality if the diet as a whole, which had an impact on which foods were prohibited at and on adolescents' food choices. Increasing financial autonomy, which coincides with the transition from primary to secondary schools, played a large part in adolescents' food choices. This confirms previous findings in Vietnamese adolescents, where pocket money increased eating out frequency (Lachat, Le, Nguyen & Nguyen 2009:1654).

Starting secondary school is a crucial period of increasing independence as the extent of parental support for eating healthy decreases and the desire to fit in with peer norms increases (Story, Neumark-Sztainer, & French 2002:S43). This process, in conjunction with easy access and constant exposure to unhealthy food in schools, explains the adolescents' indication of their deteriorating eating habits. This deterioration is highlighted further by the increasing difficulty adolescents have to eat healthily within the rapidly changing socio- cultural environment, which has impressed on family life and food availability. In previous findings (Haerens, De Bourdeauhujl, Barba, Eiben, Fernandez, Herbestreit, Kovas, Lasn, Regner, Shiakou, & De Henaus 2009:381), availability, and accessibility, self-efficacy, financial constraints, time and convenience merged as important features in adolescents' food choices.

To conclude, the environment at home and school were inconsistent, so adolescents were likely to receive contradictory messages that they regarded as marginal and they developed strategies for buying their preferred food elsewhere. This might be an indirect indication that parental influence is less important in this group than peer influence. Similar associations between mixed messages and adolescent eating preferences have been found in previous research (Krolner, Rasmussen, Brug, Klepp, Wind & Due 2011:112). Nevertheless, the impact of parents might differ across behaviours for example fruit and vegetables consumption versus sugary drink intake. Few socio-demographic differences emerged, availability and financial constraints clearly. A particular focus on school policies including regulation on food and sold at the tuck shop based on its nutritional value and control of food practices is needed. Schools may be one of the most important settings in which to promote and sustain healthful nutrition and physical activity among adolescents.

The learners participating in the study identified a number of contradictory pressures within their school environments for instance, the feeding scheme programmes, was the programmes served unpalatable food. Easy access to non-nutritious snack foods in the tuck shop, combined with unpalatability leads learners to select innutritious snacks instead of the provided lunch.

The school did not offer sporting activities as expected to allow learners to be physical active and participate in athletic competitions.

The adolescents pointed out that they require parental support to eat more healthfully. Consistent with the (Story et al 2002) findings the family comes up as a social influence that is proximal to the adolescent and should be a target for intervention. This is particularly important because multiple evidence suggests that adolescents with better eating patterns are those who are motivated and supported by their parents to eat healthful foods.

In addition, several authors have indicated that adolescents who frequently eat family meals have greater diversity in their diet, are more likely to have adequate dietary intakes, and have better health-related attitudes. According to this, it is relevant to consider the family as a strategic target for intervention design, but, to this end, it is necessary to identify the key factors that would promote or limit the establishment of a healthful eating pattern within the home. Our findings suggest that increasing home availability of healthful foods could be a potential family environment strategy to help adolescents develop healthful eating patterns, as has been evidenced by several studies.

4.4 OVERVIEW OF THE STUDY

Focus group research with adolescents indicates that many teenagers have an overriding orientation toward the present and little concern about the future in terms of their own health. Teenagers do not perceive much urgency to change their behaviour, since the future is so ephemeral and chronic diseases are connected with “older people.” Also, the long-term benefits of good health and eating practices do not outweigh the short-term advantages of certain unhealthy activities. Many of the activities, which according to teenagers are unhealthy, are inextricably intertwined with

age-appropriate developmental issues of identity, self-concept, friendship, independence, and authority. Thus, to give up what teenagers call “junk food” would be to give up much more than the activity itself. Nutrition interventions must address these deeper and more subtle social and developmental issues.

In focus groups adolescents said they lead busy, active lives and want to eat quickly. Food only receives a fraction of their attention. The nutritious foods they need are not always available to them at places and times when they eat. If adolescents are to make dietary changes, it must be in the context of their everyday lives.

4.5 CONCLUSION

In the context of this investigation, data was collected through the utilisation of focus groups. A tape recorder was used to capture information during focus group interviews. Data was subsequently analysed qualitatively to reveal the context of the research problem. The qualitative analysis followed a narration mode.

In this chapter, the analysis of the results presented reveals a worrying phenomenon. Focus group research with adolescents indicates that many teenagers have an overriding orientation toward the present and little concern about the future in terms of their own health. Teenagers do not perceive much urgency to change their behaviour, since the future is so ephemeral and chronic diseases are connected with “older people.” Also, the long-term benefits of good health and eating practices do not outweigh the short-term advantages of certain unhealthy activities. Many of the activities, which according to teenagers are unhealthy, are inextricably intertwined with age-appropriate developmental issues of identity, self-concept, friendship, independence, and authority. Thus, to give up what teenagers call “junk food” would be to give up much more than the activity itself. Nutrition interventions must address these deeper and more subtle social and developmental issues.

Findings of this study indicate that simply adding programs or policies intended to be health promoting is not sufficient where there are countervailing pressure within the school and social environment.

CHAPTER 5

CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The previous chapter primarily focused on the qualitative data collection and analysis. The collected data served as the basis upon which the true value and weight of the research findings could be supported as having practical and meaningful implications for the study and its relevant stake-holders. In this chapter, the central aim was to explore and describe eating habits and nutritional behaviours in adolescents at a Secondary School in Lenasia South. The research also explored and described the role played by adolescents eating habits and nutritional behaviours in non-communicable diseases. The current chapter provides an interpretation of the research findings by describing the common adolescents' food habits and nutritional behaviours and exploring the effective preventive strategies to deal with non-communicable diseases. Furthermore, the current chapter is intended to objectively broaden the study's practical implications and meaningfulness by presenting the, conclusions and recommendations.

Several specific common eating habits emerged from focus group endorsing the importance of coming up with future effective prevention strategies of non-communicable diseases strategies.

5.2 RESEARCH DESIGN AND METHOD

The previous chapter presented the results of the empirical investigation followed by discussions. As previously indicated, the current study was explorative in nature. Thus a qualitative method was used as a process to identify the research population and obtain data on eating habits and nutritional behaviours in adolescents at a Secondary School in Lenasia South.

The study used focus group interviews, to explore and describe eating habits and nutritional behaviours in adolescents also, described the role played by adolescents eating habits and nutritional behaviours in non-communicable diseases. Furthermore, to

collect ideas and recommendations in order to facilitate the development of effective and tailored intervention programs aiming to improve healthy eating behaviours in adolescent learners.

5.3 SUMMARY AND INTERPRETATION OF THE RESEARCH FINDINGS

5.3.1 Prior knowledge of participants about eating habits, nutritional behaviours and contribution to non-communicable disease

Adolescent's views about food and eating have been explored using focus group interviews. Adolescents report several key barriers influencing their food choices and eating behaviours, such as self-efficacy taste, habit strength, time, convenience, availability, and parental and school environment (Neumark-Sztainer, Wall, Eisenberg, Story & Hannan 2006:52-59). Many adolescents feel that healthy eating is not a primary concern during the teenage years. In general the quality of the adolescent diet is a reflection of this lack of concern. Adolescents say that in order to improve their eating, healthy foods should be appealing and taste good, and more widely available.

Adolescents mainly discussed healthy eating by identifying stereotype foods or food groups they perceived as (un)healthy, naming many more ''unhealthy'' than ''healthy'' foods. Fruit and vegetables were perceived as healthy, while potato chips, pies, bunny chow, kota and 'junk food' (referred to as such by participants) were most frequently mentioned as "unhealthy foods". On the other hand they mentioned, but less frequently, that eating healthily includes a balanced diet with a low amount of fat and lots of vitamins. Adolescents reported that they were aware of the general health benefits of eating healthily. They believed that home cooked meals are 'always' healthy as these were hygienically prepared at home. In contrast, school tuck-shop foods and food out-of-home in general were perceived as unhealthy because preparation methods were unknown (Verstraeten et al 2014:3).

5.3.2 Common adolescent eating behaviours

5.3.2.1 Skipping meals

Meal skipping is common among adolescents, especially during middle and late adolescence. Breakfast is the most commonly skipped meal and is attributed to lack of time, desire to sleep longer in the morning, lack of appetite, and dieting to lose weight. Skipping breakfast may affect concentration, learning, and school performance. As with breakfast, skipping lunch reduces intakes of energy, protein, and other nutrients. In previous research, meal skipping (particularly breakfast) has been used as a weight management strategy by adolescents, which can have negative consequences on diet quality (Neumark-Sztainer, Hannan & Perry 2003:317; Woodruff, Hanning, McGoldrick & Brown 2010:454). Those planning intervention strategies aimed at healthy food intake among children and adolescents should be aware of the negative association of meal skipping and diet quality (Overby et al 2008:395).

5.3.2.2 Snacking

Food choices made by adolescents under study while snacking tended to be high in sugar, sodium, and fat, while relatively low in vitamins and minerals. The eating habits exhibited by the adolescents is in line with (Birch & Fisher 2014:539) findings who pointed out that poor eating habits of adolescents are characterized by low intake of dairy products, fruits and green vegetables , protein, iron and high intake of sugar, soft drinks , sodium and energy dense food. Moreover, (Ogunkunle 2013:188) stipulated that this eating pattern is a major concern because it can lead to overweight, obesity and higher probability of NCDs such as diabetes, high blood pressure, cardiovascular diseases. This high consumption of soft drinks increases the risk for bone fractures over an individual's lifetime. Since adolescents often snack on what is readily available, healthy food choices should be emphasised (see Table 5.1).

Table 5.1: Teen friendly healthy snacks

Teen friendly healthy snacks	
Pudding made with skim milk	Baked tortilla chips with bean dip or salsa
A glass of skim milk sweetened with a teaspoon of chocolate or strawberry syrup	Baked potato (microwaved) topped with salsa, yogurt or fat free sour cream
Soft pretzels warmed in the microwave and topped with mustard or salsa	Graham crackers, animal crackers
Sliced apples dipped in peanut butter or fat free caramel dip	Frozen yogurt or juice bars
English muffin mini-pizzas (topped with tomato pizza sauce and mozzarella cheese)	Fruit drink spritzer (half cranberry juice and half seltzer water)
Air-popped popcorn	Trail mix (dried fruit with nuts and seeds)
Peeled and sectioned oranges	Baby carrots and low fat ranch dressing
Humus and pita bread	Low fat granola bars
Mozzarella or string cheese	Mini-rice cakes or popcorn cakes
	Sandwich wraps with slices of turkey, cheese and tomato

(Birch & Fisher 2014:539)

5.3.2.3 Family meals

In the study dinner stood out not only as the most frequently consumed meal among adolescents but it also provided a larger proportion of intake of energy and key nutrients than any other meal or snack. The current study at this secondary school established that the proportion of adolescents eating dinner with their families on a regular basis was not high. Only a third of adolescent reported eating dinner together with their families never or only a few days each week. Adolescents gave several reasons for not having meals, including parent and teen schedules, desire for autonomy, and dissatisfaction with family relations. Busy or conflicting work schedules of parents and adolescents activities were the most frequently mentioned reasons among adolescents.

These findings are also supported by (Nuemark-Sztainer et al 2006:59) whose study revealed that there is a clear relationship between family meal times and the quality of adolescents' diet. Further, more the study reported that adolescents who reported having seven or more family meals in that particular week had an average of one serving more of fruits and vegetables each day than adolescents reporting no family meals in that particular week.

If family meals are to happen on a more regular basis, broader social networks surrounding families need to support family meals. Places of employment may want to limit work obligations of parents around the dinner hour. School and community sports organisations may need to take into account family meal practices of the youth that they serve. Restaurants and food manufacturers may be able to profit from the promotion of healthy family foods to be eaten away from home. Improving the nutrition of adolescents need to become a priority of families and communities in the light of the high numbers of adolescents, who are not meeting dietary recommendations.

5.3.2.4 Non-traditional eating patterns

A central issue in adolescence is the establishment of identity, that is, a sense of oneself as unique individual. Further, adolescence is a time of experimentation and idealism. Because food is charged with symbolic meaning, it may be used as a means of establishing individuation and expressing one's identity and uniqueness. Food choices convey strong messages about the individual to friends, and family and outside world. Eating patterns such as vegetarianism may be adopted as a way of exploring new roles and life styles, testing adult restrictions, or becoming interested in global or environmental issues. A number of the adolescents pointed out that they will consider alternative eating patterns such as vegetarianism or veganism.

5.3.3 Adolescents perceived barriers to healthful eating habits and nutritional behaviours

Most adolescents' studies suggest that there is a close-knit relationship between schools, street, and home environments influences the eating behaviours of young people in this context. The influences of these pressures layered over one another demonstrate the complex formulation of dietary patterns among this sample of

adolescents. In isolation, a calorically dense school meal, or the consumption of rice and curry in the home environment, or the periodic consumption of sweets or fast foods would be unlikely to increase the likelihood of an individual becoming overweight or obese.

5.3.3.1 School environment

Despite this understanding, that adolescents do not consistently follow healthful eating recommendations. Recent data show that the adolescent diet is high in cholesterol and trans and saturated fatty acids and low in unsaturated fatty acids,' fruits and vegetables, fiber, calcium, and other nutrients. This suggests that there are aspects, other than a general lack of knowledge, that must he considered to engage adolescents in healthful eating. School was considered by the adolescents to be a factor strongly and negatively affecting their eating patterns. These findings are affirmed by Bauer et al (2004:40) who depicts that school social environments may be special important influence on dietary patterns of adolescents.

According to the findings in the study, the physical environments (community settings) most proximal to adolescents offer the opportunity to build social support for behavioural strategies and change social norms to promote healthful eating, which suggests that the school is an important intervention target. In South Africa, only a minority of high schools have a government subsidy for providing lunch to adolescents, so the school tuck-shop represents the main source of food within the school environment. Establishing a school tuck-shop that promotes healthful food choices and applying a strict school nutrition policy that regulates the quality of food and beverages sold during school cafeteria could provide adolescents with the appropriate environment and the opportunities they need to establish healthful dietary patterns.

5.3.3.2 Self-efficacy

Many adolescents felt they would not succeed in eating healthily and associated this inability with lack of self-control and the abundance of tasty, yet ‘‘unhealthy food’’ at school and/or at home. Only a few adolescents indicated that they are or would be capable of eating healthily. Eating healthful food was not a priority for most of the learners as most of the learners were not prepared to change their eating habits and

nutritional behaviours even if they were aware of the consequences. Adolescents preferred junk food to healthier foods such as fruits and vegetables as they did not taste good as other options.

5.3.3.3 Habit strength and risk perception

The current study have established that the increased financial autonomy, less parental control, and the transition from primary to secondary school accentuated the changes that have occurred in the socio cultural environment over the years. The adolescents indicated that the habit of eating in a particular way is a barrier to adopting new eating practices. They agreed that adopting healthful eating practices early in life would be ideal because it would be incorporated as "the natural thing to do" and therefore, it would be easier for them to eat more healthfully. The possible health damages associated with the consumption of sodas, snacks, and fast foods and with not eating fruits and vegetables were frequently discussed by the adolescents. However, they do not recognise any immediate damage in doing so but see it as a very distant concern of adulthood.

5.3.3.4 Time

Common barriers cited were a lack of time to prepare food, do grocery shopping, or eat healthfully because of socialising and studying. Most students agreed they lacked time to eat healthful foods (e.g., salads, pastas); however, some countered that eating quickly and well is possible if one uses fast, easy-to cook recipes and prepares extra food to save for another meal/day.

5.3.3.5 Lack of availability of healthful food

The participants responded that they have to eat what is available to them (at home, school) and often that does not include healthful foods. In our study, lack of availability was mentioned consistently as a barrier to healthier eating in all two locations that the adolescents were asked about. In fact, lack of availability came up more often than any other barrier. When these results correspond to results from other qualitative and quantitative studies, lack of availability was usually not given as the most important barrier in other studies.

Lack of availability of healthful foods at home may be connected with the fact that these adolescents were from low-income families (all participants qualified for the free lunch program). For these adolescents, the relatively higher cost of healthier foods may be a barrier even though they did not state this directly.

These results suggest that education for both parents and adolescents about practical strategies to incorporate healthier foods into their current diet in a way that is not more costly may be warranted. Lack of availability at school was indicated as another barrier, one that is more associated with necessary environmental and policy changes at the school may need to add more healthful foods and change the way they prepare and present their lunch food on the line. For example, providing fresh fruit or vegetables at a free or reduced cost to the students may facilitate healthier choices.

5.3.4 Strategies for healthful eating

When the participants were asked about which specific strategies would motivate them to eat healthier at home, at school, and when out with friends, three major themes came up: better tasting and looking foods, more healthful options (at all three locations), and more emphasis from role models and peers to eat more healthful food. Although previously mentioned, students were admittedly very turned off by foods that appeared "nasty" and did not taste good. Therefore, they suggested that they would be more motivated to eat healthful foods if they tasted good and looked appealing.

Several suggestions were made to employ taste testing as a way to learn more about eating healthful foods. Taste testing as a method to increase healthful eating has been used successfully in nutrition related interventions. Also, a large number of students indicated that their food choices were based on what was commonly available to them- either bought by their parents for the home or served at school. If parents purchased healthier foods (with or without the help of their children) and emphasised or modelled eating them at home, or if cafeterias served healthier food choices, students may be more motivated to eat healthier.

Adolescents emphasised that if someone they respected, admired, or thought of as an "adult" asked them to eat healthier, or suggested a healthier food choice; they would be more likely to choose the healthful option. Perhaps this is a strategy that can be used in

interventions. Similar to other research findings, peer influence also was mentioned as a significant motivator. One girl suggested that if popular people ate healthful food, then everyone would; or if the "leader" of a group suggested going someplace healthful to eat, then they would be more likely to do so.

5.4 CONCLUSIONS

In terms of recommendations we should be reminded of the burden of the chronic non-communicable diseases (NCDs) in South Africa and the associated high mortality rate from some of these diseases. Teenagers are on the brink of adulthood and it is likely that the dietary habits which have been fostered by the family and school will continue into adulthood. A low fat and saturated fat intake, on its own, is not adequate for the prevention of NCDs. Engelfriet et al (2010:53) postulate that “broader adherence to recommendations for daily intake of fruit and vegetables, fish and fatty acid composition may take away as much as 20-30% of the burden of cardiovascular disease and result in approximately one extra life year for a 40-year-old individual”.

Ideally, South African children should learn about good nutrition at home and at school. There is sufficient convincing evidence that school-based curriculum-based nutrition programmes significantly increase children’s nutrition knowledge and improve their dietary behaviour. Additionally, schools should develop school wellness policies6 and limit access to unhealthier (high sugar, high fat) food options on the premises. The Health Kick, a collaborative research study of the MRC, HSRC and UCT Sports Science Institute is one such intervention aimed at producing a nutrition and physical activity curriculum for schools in South Africa to implement as part of Life. If successful in improving nutrition knowledge and behaviour of children, it can serve as a model for other schools.

5.5 RECOMMENDATIONS

The findings of this study contribute to a better understanding of the adolescent’s food habits and nutritional behaviours that affect the establishment of effective strategies of dealing non-communicable diseases from developing countries.

Adolescents recommended that quality of food of the tuck-shop such as brown bread for sandwich, fruits and vegetables should be available. The tuck shop should improve on the health and hygiene of the premises. Adolescents should limit junk food in the diet and should be encouraged to eat from the feeding scheme. The school should introduce sporting activity at school. The feeding scheme should provide food that is colourful or appealing and tasty.

Nevertheless, further research is needed to explore in depth the factors that affect the establishment of eating patterns in adolescents to ensure that the family interventions address relevant concerns and needs. Aspects such as parental eating habits, household income, parents' education, and healthy diet-related knowledge, attitudes of parents, parents' work schedules, family relationships, family structure, and availability of foods at home and in the community setting must be considered.

Moreover, it is necessary to explore how the adolescents" socialisation patterns-particularly among males-influence the establishment of their eating patterns, in such a way that public health interventions can be designed with a gender approach. In addition, because this work is not generalisable, it might be appropriate to conduct quantitative research with adolescents to measure the extent to which the barriers and motivators identified in this study are significant and to assess differences between different groups of adolescents.

This study identified future research questions: How do these dietary habits and eating practices contribute to total energy intake and affect body composition? How do these patterns relate to dietary diversity? (Oldwage-Theron & Kruger 2011:425). Do the dietary habits and eating practices described here differ in adolescents of higher socioeconomic status living in other suburbs of Johannesburg? A better understanding of the preparation and composition of the main family meal could guide potential interventions because parental influence in this regard is still strong in most of this population. In South Africa, the food available in schools is unregulated; another possible intervention could therefore focus on schools because these settings are more contained than within the wider community. Also, educating parents and adolescents about the importance of correct eating patterns to encourage more lunch box usage could be considered, especially because we found that the most food carried by learners in their lunchbox were most popular lunch box foods were relatively healthy.

5.6 CONTRIBUTIONS OF THE STUDY

Evidence exists that adolescent obesity is, in fact, contributing to the non-communicable burden of disease in South Africa. Providing information on nutritional behaviours and the eating habits of adolescents is important in order to identify risky and unhealthy behaviour in this age group. The findings might assist the policy makers in executing effective intervention programmes to bring about positive changes in food intake and to reduce the occurrence and development of chronic NCDs later in life. A health promotional intervention will help to reduce unhealthy dietary practices among adolescents, decreasing their risk for developing diet-related diseases and disorders that can detrimentally affect their lives.

5.7 LIMITATIONS OF THE STUDY

Limitations of the study include the reliance on self-report data without an objective data source to supplement focus group. As a result, we may not have identified other common eating habits that participants were unable to or unwilling to discuss. Because our research was conducted within cohesive school community, participants in focus groups knew each other, which might have led some to be less sincere in their comments, perhaps because of reluctance to be perceived as criticising peers or colleagues.

On the other, shared experience of the group participants may have facilitated profound levels of discussion and ultimately richer data collection. Another limitation of this study was that recruitment and data collection were carried out during school hours. As a result learners who were frequently absent would not participate, nor were we able to include parents. Perspectives of learners who did not take part in the study may differ significantly from those participants who were willingly and unable to attend the research sessions.

Given adolescence's own influence and the fact that adolescents' way of thinking is oriented to be here and now, “focusing on the benefits of a long-term healthy diet may not be a good strategy”.

This study has some important limitations. First, the sample only included adolescents enrolled in school; therefore, adolescents not participating in the educational system owing to social or economic reasons were not included. Second, the study is solely based on the adolescents" opinions and did not take into consideration the perception of the groups or adults who interact with them and who represent an important secondary group to involve in the design of interventions for promoting healthy adolescent development. Third, the results obtained cannot be generalised beyond the group of adolescents included in the study, although clearly do provide a first approach to the barriers to and motivators for healthful eating as perceived by adolescents.

5.8 CONCLUDING REMARKS

Our nation's future health depends on the health of its adolescents and youth nutrition is a key measurement of overall wellness, and healthy dietary practices are essential in helping adolescents avoid chronic disease and other diet-related problems that can negatively affect their lives today and in the future. To make a crucial difference in the nutritional practices of our adolescents, educators must be willing to provide the necessary resources school environment that upholds and facilitates high quality nutritional practices. Because of the damage that unhealthy dietary behaviours cause, we cannot afford to sidestep this issue any longer. Parents, educators, health professionals, and community members must join together to help our nation's youth learn eating attitudes and behaviours that will last a lifetime.

Adolescents remain one of the most underserved populations, especially minority youth. Many of the health education-related resources available do not adequately address the recommended preventive practices. Although past interventions have resulted in increases in knowledge, the ultimate goal of health education is to positively influence lifestyle behaviour and enhance health through the reduction of risk factors. A behavioural focus addresses the domains of learning the ‘‘how,’’ the factors that motivate one to change current lifestyle patterns, and assists in building new skills and behaviours. Although there is evidence that several factors independently contribute to the development of chronic diseases such as type 2 diabetes or heart disease, the results of several prevention studies in adults indicate that there are now interventions that are successful in eliciting behaviour changes that promote a reduced incidence of chronic diseases or at least delayed onset of these diseases.

In order to be effective, however, the knowledge and skills must be learned so that the targeted behaviours can be incorporated into the lifestyle of the target group. Programs that facilitate not only the understanding of proper nutrition but also elicit a change in dietary behaviours among adolescents are necessary to enhance the health and well-being of this group. Such interventions will offer us as educators a means to provide relevant information that allows for individualised strategies to promote weight management, healthy eating habits, and may result in improved health status for this population.

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ANNEXURES

Annexure A: Approval letter from the university

UNISA university of south africa

UNIVERSITY OF SOUTH AFRICA
Health Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE

REC-012714-039

HSHDC/374/2014

Date: 10 December 2014 Student No: 4296-211-8

Project Title: Exploring food habits and nutritional behaviours in adolescents at Willowmead Secondary School in South Africa.

Researcher: Proper Ndlovu

Degree: Masters in Public Health Code: DLMPH95

Supervisor: Prof ZZ Nkosi
Qualification: PhD
Joint Supervisor: -

DECISION OF COMMITTEE

Approved [√] **Conditionally Approved** [ ]

Prof L Roets
pp **CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE**

J.L. Roets (Prof)

Prof MM Moleki
ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES

Annexure B: Letters seeking consent

Leopard Rocks Estate
Hendrina Drive
Ridgeway
South Gate
2091
11/05/2015

The Principal

REF: PERMISSION TO CONDUCT ACADEMIC RESEARCH

Dear Sir/Madam

My name is Proper Ndlovu and I am a Master student from the Department of Health at the University of South Africa.

I am herewith ask for permission to carry out a research study at your school on adolescents' food habits and nutritional behaviours. The purpose of the research is to explore the adolescents' food habits and nutritional behaviours. This study will not benefit your child directly; the information obtained may help those having poor health eating behaviours and also to come up with strategies that will prevent the escalation of non-communicable diseases. All reports will be accessible to the school, the teachers participating, the learner and their parents/guardians and will remain the property of the University of South Africa.

This letter will serve as your consent to complete the activity at your school and a copy will be kept with Prof Z.Z.Nkosi in my file at the University of South Africa.

Sincerely,
Proper Ndlovu
[084 6031192] [proendlovu2006@gmail.com]

Leopard Rocks Estate
Hendrina Drive
Ridgeway
South Gate
2091

11/05/2015

Dear Parent

My name is Proper Ndlovu and I am a Master student from the Department of Health at the University of South Africa.

I am herewith inviting you to participate in a research study on adolescents' food habits and nutritional behaviours. The purpose of the research is to explore the adolescents' food habits and nutritional behaviours. This study will not benefit your child directly, the information obtained may help those having poor health eating behaviours.

Participation in this activity is of course voluntary and participants will be notified that they may withdraw at any time, should they wish to, without penalty. There are no known risks to participation in the activity and no compensation will be received for participation. To protect their confidentiality, pseudonyms will be used for all participants. All information will be treated with the utmost confidentiality and will not be made available without the permission of those involved. All reports will be accessible to the school, the teachers participating, the learner and their parents/guardians and will remain the property of the University of South Africa.

This letter will serve as your consent to complete the activity at your child's school and a copy will be kept with Prof ZZ.Nkosi in my file at the University of South Africa.

Sincerely,

Proper Ndlovu
[084 6031192] [proendlovu2006@gmail.com]

Leopard Rocks Estate
Hendrina Drive
Ridgeway
South Gate
2091

11/05/2015

REF: LETTER OF CONSENT

Dear Learner

I am herewith inviting you to participate in a research study on adolescents' food habits and nutritional behaviours. The purpose of the research is to explore the adolescents' food habits and nutritional behaviours. This study will not benefit you directly; the information obtained may help those having poor health eating behaviours.

As far as I can tell, there should be no risks or discomforts to you in sharing your own story. Your participation will mean that you will meet with me and other participants for a focus discussion lasting for 45mins. The discussion will be audio taped.

I will keep a record of who has participated in this study, and will keep the tapes of our discussions, together with a transcription of those tapes. Your name will not be on the tape or on the transcription of those tapes, so that data will be linked with your name. All data will be stored in a secure place and no one except the research team will have access to the focus group discussion content. Your identity will not be revealed when the study is reported or published.

If you have any questions about the study or about participating in the study, please feel free to ask me (Ms P. Ndlovu) you may call me at 0846031192.

Your participation in this study is totally voluntary: you are under no obligation to participate. You have the right to withdraw at any time if you care to, without repercussion or penalty, even in the middle of the focus group discussions.

The study and its procedure have been approved by the appropriate people and research committees of Gauteng Universities.

I have discussed the above points with the subject. It is my opinion that the subject understands the risks, benefits and obligations involved in participating in this project.
Sincerely,

Proper Ndlovu
[084 6031192] [proendlovu2006@gmail.com]

Leopard Rocks Estate
Hendrina Drive
Ridgeway
South Gate
2091
11/05/2015

The District Director
Johannesburg South D11

REF: PERMISSION TO CONDUCT ACADEMIC RESEARCH

Dear Sir/Madam

My name is Proper Ndlovu and I am a Master student from the Department of Health at the University of South Africa.

I am herewith ask for permission to carry out a research study at your school on adolescents' food habits and nutritional behaviours. The purpose of the research is to explore the adolescents' food habits and nutritional behaviours. This study will not benefit your child directly; the information obtained may help those having poor health eating behaviours and also to come up with strategies that will prevent the escalation of non-communicable diseases. All reports will be accessible to the school, the teachers participating, the learner and their parents/guardians and will remain the property of the University of South Africa.

This letter will serve as your consent to complete the activity at your school and a copy will be kept with Prof ZZ Nkosi in my file at the University of South Africa.

Sincerely,

Proper Ndlovu
[084 6031192] [proendlovu2006@gmail.com]

Annexure C: Letter of approval from Department of Education

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

For administrative use:
Reference no: D2015 / 431

GDE RESEARCH APPROVAL LETTER

Date:	**7 April 2015**
Validity of Research Approval:	**7 April 2015 to 2 October 2015**
Name of Researcher:	**Ndlovu P.**
Address of Researcher:	**414 Malibu Court; 4 Percy Street; Yeoville; 2198**
Telephone / Fax Number/s:	**011 042 6165; 084 603 1192**
Email address:	**properndlovu@gmail.com**
Research Topic:	**Exploring food habits and nutritional behaviours in adolescents at a secondary school in South Africa**
Number and type of schools:	**ONE SECONDARY School**
District/s/HO	**Johannesburg South**

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved. A separate copy of this letter must be presented to the Principal, SGB and the relevant District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted. However participation is VOLUNTARY.

The following conditions apply to GDE research. The researcher has agreed to and may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

CONDITIONS FOR CONDUCTING RESEARCH IN GDE

1. The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter;
2. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB);

2015/04/08

1

Making education a societal priority

Office of the Director: Knowledge Management and Research
9th Floor, 111 Commissioner Street, Johannesburg, 2001
P.O. Box 7710, Johannesburg, 2000 Tel: (011) 355 0506
Email: David.Makhado@gauteng.gov.za
Website: www.education.gpg.gov.za

3. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned;
4. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, SGBs, teachers and learners involved. Participation is voluntary and additional remuneration will not be paid;
5. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal and/or Director must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage;
6. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year;
7. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
8. It is the researcher's responsibility to obtain written parental consent and learner;
9. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources;
10. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations;
11. On completion of the study the researcher must supply the Director: Education Research and Knowledge Management with one Hard Cover, an electronic copy and a Research Summary of the completed Research Report;
12. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned; and
13. Should the researcher have been involved with research at a school and/or a district/head office level, the Director and school concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

.....

Dr David Makhado

Director: Education Research and Knowledge Management

DATE: 2015/04/08

Annexure D: Focus group interview guide

TYPE	QUESTIONS
OPENING	Now, let's start by everyone sharing their names and age.
TRANSITION	What is your idea of eating habits?
KEY	Describe your own eating habits.
	If you had the option of changing some of your habits, what would they be?
	What do you normal have for breakfast before leaving for school?
	Give a list of food I can find in your lunch box.
	What type of food do you enjoy and indulge in from the school tuck shop
	In a typical week which meals do you part take with your family? How regularly.
	Which fruits and vegetables do you normal eat?
	Which sporting activity are you engaged with at school?
	In light of the uncertain whether conditions, which beverages do you drink?
	Have you noticed any change in your eating habits since you enrolled at a Secondary School?
	If so/not, what do you attribute this change to?
	Which diseases do you think are attributed to eating habits?
ENDING	Do you have any remarks, suggestions and additions
	Soon, we will try to help adolescents make healthier choices. Can you give us some advice on how to promote healthy eating behaviour in adolescents

Annexure E Focus group interview transcripts

GROUP 1

EATING HABITS NUTRITIONAL BEHAVIOURS IN ADOLESCENTS AND THE ROLE THEY PLAY IN NON-COMMUNICABLE DISEASES.

What is your idea of eating habits?

Learner 1 : “It is a way in which people live, eating lifestyle”.

Learner 2 : “It is eating wrong food for example Kota, chips or too much fat”.

Learner 3 : “It is to do with people who no longer eat healthy foods, for example, in the olden days people where eating healthy food but now people are eating too much fats and junk food”

Learner 4 : “When people are eating unhealthy, for example, burgers at home”.

Learner 5 : “It is eating healthy and unhealthy; something that you do on regular basis, eating one kind of food on a regular basis and never change”.

Learner 6 : “I think is eating unhealthy food, kota home, bunny chow and pizzas”.

Learner 7 :“habit is something you do on regular basis: eating one kind of food on regular basis never changing”.

Learner 8 :“eating habits is how people tend to eat something regularly, for example, eating kotas, pie and bunny chow during lunch at school etc”.

Learner 9 : “eating habit is food you usually eat, for example eating bunny chow, scava (feeding scheme)”.

Describe your own eating habits.

Learner 1 : “I normally eat soft porridge in the morning, for lunch eat from the feeding scheme, when I get home eat bread, supper we usually eat pap, meat, sausages, spinach. I do eat vegetables once a month”.

Learner 2 :“Lots of times I skip breakfast, but I do carry a lunch box. It is normal composed of bread, margarine, Russian sausage and they is always a fruit. For lunch I skip it or buy a pie”. When I get home after school I do not eat. Supper, we normally eat, rice depending on what is cooked, it could be rice, lamb, beef, and no vegetables”.

Learner 3 : “it is compulsory for each family member to eat breakfast, witbix, and cornflakes. Break time I eat crackers snack, kip-kik, skoppers, and amabhujwa. When I get home I usually eat snacks again, chocolate and

biscuits and for supper we have pap, with beef and only eat vegetables on a weekend only, my mother does not cook vegetables during the week".

Learner 4 : "I never miss a meal; I have breakfast consisting of jungle oats, porridge, sweets a bunch of them. I do not eat anything during lunch time because am always busy but I do have supper, we normal eat rice, potatoes, meat, they will be vegetables but I do not eat them".

Learner 5 : "I eat, Kellogg's, all bran for breakfast, for lunch I eat from the feeding scheme or bring a lunch box, when I get home I bread, orange juice and polony. During supper I eat pap, meat, chicken pieces, beef, tinned fish and morogo".

Learner 6 : "In the morning I eat toasted bread, margarine, coffee, during lunch time I buy a pie and snacks, when I get home toasted bread again and margarine. For supper we normal have pap, meat, vegetables and salads. At night I eat left-overs with bread or pap before going back to sleep".

Learner 7 : "I eat soft porridge in the morning sometimes left over s of the previous night. Lunch time, I go eat at the feeding scheme. When I get home do not eat wait for super. For supper I eat papa, fish, and vegetables except cabbage".

Leaner 8 : "I eat instant porridge in the morning, I do ski lunch for supper we normal have pap and fresh milk"

Learner 9 : "I eat soft porridge in the morning. During lunch I eat from feeding scheme which normal serve cabbage and for supper its pap and fresh milk.

Learner 10 : "I drink tea in the morning because it keeps me warm, always skip lunch at school because am always busy. For supper I eat pap, meat, rice and beef. I do not eat vegetables".

Learner 11 : "In the morning I eat cornflakes or jungle oats during lunch I regularly eat a pie, when I get home I eat 1 fruit or lettuce salad before going for soccer practice. We are forced to eat lettuce and for supper we normal have mohodi".

Learner 12 : "Breakfast I eat cornflakes and a snack, I always skip lunch. For supper we normal eat pap and beef, fish and cabbage sometimes".

If you had an option of changing some of changing some of your eating habits, what would they be?

Learner 1 : “I like my habits I will not change”.

Learner 2 : “Instead of buy snacks at the tuck-shop and bring my own lunch”.

Learner 3 : “I will stop eating sweet stuff for example chocolates”.

Learner 4 : “I will stop eating Pap and meat, I want to be a vegetarian and eat morogo only”.

Learner 5 : “I want to stop eating pies and late night eating, it is not healthy, normally its cause obesity”.

Learner 6 : “I will not change my habits am very happy with them”.

Learner 7 : “I will not change my eating habits”.

Learner 8 : “My eating habits changed when I got to secondary school because at primary school the tuck-shop used to sell fruits, now this tuck-shop only sell junk food‘.

Learner 9 : “I will not change anything”

Learner 10 : “I stop eating pies, bunny chow and carry lunch box from home”.

Give me a list of items I can find in your lunch box.

Learner 1: “When I was in primary school I used to carry a lunch box with bread and eggs now because I am in grade 11 now I no longer carry a lunch box.”

Learner 2: “I normal carry white bread, burger patty and mayonnaise”.

Learner 3: “I do not bring packed lunch, if there is no money to buy from the tuck-shop I just skip lunch. I stopped going to the feeding scheme a while ago”.

What type of food does you enjoying and indulge in from the school tuck-shop?

Learner 1 : “I enjoy the bunny chow, quarter, polony, Russian burger, chips, atcher sauces, biscuits, and snacks”.

Learner 2 : “I do not buy from the tuck-shop, it is not clean, and I buy from the cars, biscuits and snacks”.

Learner 3 : “I do not buy from the tuck-shop because it is not clean, they hold chips with their hands, and I buy pie, snacks, and sweets from the cars”.

Learner 4 : “I usually buy red cake and coke”.

Learner 5 : “I do not usually buy from the tuck-shop I save”.

Learner 6: “I always buy amabhujwa and scoppers”.

Learner7: “I buy amabhujwa and snappers”.

Learner 8: “I buy stock sweets, ginger biscuits”.

Learner 9: “I usually buy stock sweet, afat cakes and cracker snacks.

In a typical week which meals do you take part with your family?

Learner 1 : “We usually eat together breakfast lunch and supper on Sunday and Saturday breakfast only”.

Learner 2 : “We eat together all the meals every day except for Sunday”

Learner 3 : “We only eat together breakfast on a Sunday.

Learner 4 : “Only Sunday breakfast because we are always busy during the weekend”.

Learner 5 : “We only eat together on weekends only supper, excluding Friday and Saturday”.

Learner 6 : “only eat together on Friday and Saturday”.

Learner 7 : “Only eat together on Fridays only”.

Learner 8 : “We eat together every day except Saturday”.

Learer8 : “Only eat together once a week”.

Learner 9 : “We only together on a Saturday”

Learner 10 “We eat together as a family once a week on Sunday”.

Learner 11 : “We eat together as a family every day except weekends”.

Learner 12 : “We eat together on Sunday’ breakfast only”.

Which fruits and vegetables do you normal eat?

Learner 1 : “I do not eat vegetables, they do not have taste. I like all fruits but I am allergic to pineapple”.

Learner 2 : “I eat almost all the vegetables except morogo and spinach. As for the fruits I dislike pears and bananas”.

Learner 3 : “I eat all vegetables except pumpkin and butternut. As for the fruits I eat all of them except a pawpaw”.

Learner 4 : “I eat all fruits and vegetables”.

Learner 5 :“I eat all vegetables and fruits but I do not like a banana, when it becomes brown can eat it only when it is still yellow”.

Learner 6 : “I eat all kinds of vegetables; do not like a pumpkin, as for the fruits only like bananas”.

Learner 7 : “I eat all fruits except an avocado”.

Learner 8 : “I eat all fruits and vegetables; I always apply a banana as spread on my bread”.

Learner 9 : “I do not like fruits and vegetables, like oranges, mangoes and bananas”.

Learner 10 : “I dislike all fruits and vegetables”.

Learner 11 : “I hate all fruits and vegetables excluding tomatoes”.

Learner 12 : “I eat all vegetables but I hate a banana”.

Learner 13 : “I hate all fruits and vegetables”

Which sporting activity are you engaged with at school?

Learner 1 : “There are no sporting activities at school but I used to play boxing got unfit, because of bad eating habits kicked in could not keep up”

Learner 2 : No sporting at school now but used to play cricket, but no longer doing anything now”.

Learner 3 : “I still play soccer during break at school and at home with friends”

Learner 4 : “I play soccer every day at school during break and home after school”

Learner 5 : “I do play soccer at home sometimes”.

Learner 6 : “I do not do sports at all”

Learner 7 : “I do play net ball at times”

In the light of uncertain whether conditions which beverages do you drink.

Learner 1 : “I always drink energy drinks, cascade, and mazoe and do not drink when it is not hot”.

Learner 2 : “I always drink Fanta grape at school and coffee or tea at home”.

Learner 3 : “I drink juice, energy drinks water, coffee and tea”.

Learner 4 : “I drink a lot of water”.

Learner5 : “I drink coke and coffee

Learner 6 : “I drink a lot of tea with 8 sugars and stone ginger beer”.

Learner 7; “I normal drink a lot of water, used to drink a lot of tea but since stopped.

Learner 8: “I drink traditional beer, umqombothi”.

Have you noticed any change in your eating habits since you enrolled at a secondary school in Lenasia?

Learner 1 : “ my eating habits changed for the worst, I am now eating a lot like a horse , now eat a lot but anywhere it is not a problem, I will continue with my eating habits whether good or bad.

Learner 2 : “It has changed a lot because I was at a boarding school where we used to eat lots of beans”.

Learner 3 : “my eating habits changed have replaced kota with very sweet things”.

Learner 4 : “I have only changed the type of food, dropped fat cakes and replaced them with pies.”

Learner 5 : “My eating habits changed I have dropped kota during break and now am eating from the feeding scheme.

Learner 5 : “My eating habits have changed from the worst. I have dropped the kota to fat cakes and hopped to a pie”.

Learner 6 : “My eating habits at school changed a lot, used to go for feeding scheme in grade 8 and 9 but I have stopped now I am buying afat cakes.

Learner 7 : “My eating habits have not changed anything’

Learner 8: “not changed still eating from feeding scheme”.

Learner 9 : “My eating habits have not changed”

Learner 10 : “My eating habits have changed, at primary I did not eat during lunch, because issued to play a lot but since I came to this school I usually carry money for buying kota”.

Learner 11 : “my eating habits have not changed”.

If so, what you attribute the change to and which diseases do you think are attributed to eating habits.

Learner 1 : “Bad eating habits cause constipation, which is caused by too much white / brown bread”.

Learner 2 : “Obesity caused by eating too much food”.

Learner 3 : “Kwashiorkor caused by consuming a lot carbohydrates than proteins.”

Learner 4 : “Diarrhoea, when you find a fly or cockroach in your food and over use of oil”.

Learner 5 : “Bulimia, when people stop eating”.

Learner 6 : “Cholesterol caused by too much fats”

Learner 7 : “high blood pressure caused by a lot of salt”

Learner 8 : “Osteoporosis caused by lack of milk and milk products’.

Learner9: “Eating late night after meal. It is not healthy it causes diseases”.

Do you have any remarks or suggestion and addition; so that we help the adolescents make healthier choices? Can you give us some advice on how to promote healthy eating behavior in adolescents?

Learner 1 : “The principal needs to improve the quality of food served in the school t tuck-shop”.

Learner 2 : ‘the tuck-shop is serving kota, chips and chocolates; we need healthy food such as brown bread, always buy pies because the options are limited”.

Learner 3 : “menu should be changed, also include fruits”

Learner 4 : “The tuck-shop should serve food that can make us full for longer, for example pap and beef and vegetables”

Learner 5 : “We also need healthy beverages such as amahewu and also healthy hot beverages”.

Group 2 focus discussions

What is your idea of eating habits?

Learner 1 (2) : “Eating habit is the way you eat on regular basis”

Learner 2(2) : “eating habits are eating disorders”.

Learner3 (2) : “Eating habits are the food you eat to make you feel better and type of food you eat regularly every day”.

Learner 4(2) : “Eating habits are food that you eat regularly and you know how to make”

Describe your eating habits.

Learner 1 (2) : “I always skip breakfast, because I have no time to prepare, so I eat snacks. For lunch I normal bring a lunch box or otherwise I will buy junk food.”

Learner 2(2) : “I have left overs of the yester night for breakfast; I have fat cakes for lunch”.

Learner 3(2) : “I always eat breakfast because it keeps you full and help you to concentrate in class”.

Learner 4(2) : “I normal skip breakfast, I normally have kota for lunch, in the evening we rice and vegetables sometimes.

Learner 5(2) : “I have soft porridge or oats for breakfast, fat cakes, snacks or a fruit for lunch and for dinner we have pap, rice, beef and we always have vegetables and we are forced to eat them”.

Learner 6(2) : “I always have bread, polony and tea for breakfast, for lunch it depends if I have money I buy kota or snacks, for supper we normal have pap, meat and vegetables”.

Learner 7 (2) : “I always have breakfast which consists of soft porridge, for lunch I have bread with polony and for supper pap and fresh milk and I do not usually eat vegetables”.

Learner 8(2) : “I always eat soft porridge for breakfast, lunch buy kota and supper pap, beef”.

Learner 9(2) : “I always skip breakfast because I will be busy in the morning, and carry a lunch box to school with bread and butter, and for dinner we have pap and cabbage”.

Learner 10(2): “I normal eat soft porridge, and sometimes skip lunch for supper we normal eat pap, cabbage, liver and vegetables.

What type of food do you enjoy and indulge in from the school tuck-shop?

Learner 1(2): “I do indulge kota and coke”.

Learner 2(2): “Chelsea buns and red cake”.

Learner 3(2): “Bunny chow”.

Learner3 (2): “red cake because it is cheaper”

Learner 4(2): “kota because of junk”.

Learner5 (2): red cake and kota”.

Learner 6(2) : “red cake”.

Learner 7(2) : “Bunny Chow”.

Learner 8(2) : “Kota and pie”.

Learner 9(2) : “Bunny Chow”

In a typical week which meals do you take part in with your family? How regularly? Which fruits and vegetables do you normal eat?

Learner 1(2) : we eat together all the meals, have a nice conversation, we just enjoy spending time together”.

Learner 2(2) : “We only eat supper together; we do eat vegetables and potatoes as a family. On Sundays that is when we have a variety of vegetables, pumpkin, potatoes”.

Leaner 3(2) : “We only eat supper together; we do not eat vegetables during the week. Vegetables are only eaten on Sundays".

Learner 4 (2) : “We eat supper as a family, vegetables such as carrot, beetroot and potatoes are normal available”.

Learner 5 (2) : “We normal eat super together; we are forced to eat vegetables because my mother is diabetic”.

Learner 6 (2): “At home we normal eat breakfast and supper together. There is always plenty of vegetables and my mother forces us to eat them”.

Learner 7(2) : “We only eat together on Sundays only, and we do not normal serve vegetables.”

Learner 8(2) : “We eat all meals as a family except lunch; we also eat a variety of vegetables such as pumpkin, spinach, cabbage and tomatoes”.

Learner 9(2) : “We only eat supper as a family on Saturdays and Sundays only. My families do cook a variety of vegetables but I do not eat them.”

Learner 10(2): “ We do not normally eat together because my mother is a nurse, works night shifts but when she is there we eat together and she forces us to eat vegetables because she is diabetic”..

Which sporting activity are you engaged with at school / and in the light of uncertainty of the weather conditions, which beverages do you drink? Have you changed your eating habits since you arrived at this school?

Learner 1(2) : “I like soft drinks and do not like tea. My eating habits changed, when I was at primary I used to carry a lunch tin but I stopped when I got this school. May be that is the reason why my weight increased from 51 to 96kg”.

Learner 2 (2) : “I prefer fresh juice and tea, I do not drink coffee. My eating habits have changed”.

Learner 3(2) : “I prefer coffee and soft drink anytime of the day. My eating habits have changes a lot I now weigh 51kg are low am weighing 96kg”.

Learner 4(2) :“I drink coffee and tea depending on availability at home. Mu habits have also changed because I used to sell fruits and vegetables.

Learner 5 (2) : My eating habits have changes because I used to come out of school early and will be able to have 4 meals a day, my eating habits has changed as a result.

Learner 6(2) : “I enjoy drinking coffee. My eating habits have change I now eat twice a day”.

Learner 7(2) : “I drink a lot of coffee. My habits have not charged I still carry a lunch box”.

Leaner 7(2) : “I enjoy juice and cold drink. My eating habits have changed because at primary used to carry fruits, with bread and margarine”.

Learner 8(2) : “My eating habits changed because I was eating from the feeding scheme since primary, until grade 9. I stopped because my friends do no approve, and that is why I ended up skipping lunch. But I think adolescents should be encouraged to eat from the feeding scheme because it provides better quality of food, not that it is for the poor”.

Which sporting activity are you engaged with at this school?

Chorus: “We do not have sports at this school”.

Which disease do you think are attributed to eating habits?”

Learner 1(2) : “Hypertension which is caused by food we eat with a lot of salt”.

Learner 2(2) : “Obesity which is caused by eating fat foods such as kota, fat cakes. But if you eat healthy foods”.

Learner 3(2) : “Bulimia when teenagers become obsessed of being skinny, we binge and use laxative”.

Learner 4 (2) : “Diabetes which caused by a lot of sugar”.

Learner 5(2): “Anemia which is caused by not drinking a lot of water”.

Learner 6(2) : “Too much of food leads to obesity, mea eating habits changed, I used to weigh 51 kg now I am 96kg”.

Do you have any remarks, suggestions and additions; so that we will try to help adolescents make healthier choices? Can you give advice on how to promote healthy eating behavior in adolescents?

Learner1 (2) : “We should encourage the tuck-shop to sell less junk food and include fruits and sandwiches”.

Learner 2(2) : “The tuck-shop should sell pap and vegetables”.

Learner 3(2) : “we should talk to the principal so that he manages what is sold in the school tuck-shop”.

Group 3: Female and male focus group discussions.

What is your idea of eating habits?

Learner 1(3) : “It when someone has stress and over eats”.

Learner 2(3) : “Something that you normal do”.

Learner 3(3) : “It is eating too much of everything every time”

Learner 4(3) : “Is when you are stressed and u overdose on food”

Learner 5(3) : “it is over eating of food”.

Learner 6 (3) : “When you chose the wrong food to eat”.

Describe your own eating habits

Learner 1(3) : “For breakfast I have a cup of tea, bread with peanut butter, lunch I eat at the feeding scheme and supper we normal have rice and beef sometimes with vegetables such as cabbage carrots and pumpkin. One vegetable should be available during the meal”.

Learner 2(3) : “For breakfast I always have lolly pop. During lunch I eat afat cakes or kota and for supper rice, meat and no vegetables”.

Learner 3(3) : “I usually have a cup of tea with 6 slices of bread, with peanut butter for breakfast. For lunch I buy kota and supper I have pap, spinach and beef.”

Learner 4(3) : “I normally skip breakfast, during lunch I eat 6 slices of bread and juice and a snack. For supper we normally have pap, egg stew, Russian, meat, we always have fruits because we sell them”.

Learner 5(3) : “I usually skip breakfast for lunch I buy kota, samosa and for supper we have pap, sausages, fish and I do not like vegetables”.

Learner 6(3) : “I normally eat cornflakes, stock sweets for breakfast and carry a lunch box with bread and peanut butter/ jam. After school I eat 4 slices of bread and tea. For supper we normal have pap, meat, I do not eat vegetables even if they are available”.

Learner7 (3) : “I eat 4 slices of brown bread with margarine and tea in the morning, I skip lunch. In the afternoon when I get home I eat a fruit and for supper we pap and vegetables”.

Learner 8(3) : “I eat fruits, 4 slices of bread and jam for breakfast. I normal skip lunch or eat snack. For supper we have pap and meat and no vegetables”.

Learner 9(3) : “I eat 4 - 8 slices of bread in the morning because it is healthy; normally I fast during lunch and only eat supper”.

Learner 10(3): “I have a cup of tea in the morning, skip lunch when I get home I eat a kota and I skip supper”.

Give a list of food I can find in your lunch box

Learner 1(3) : “You will find leftover food on Mondays, Tuesday to Friday 6 slices of brown bread with margarine and juice”.

Learner 2(3) : “You will find an apple, 2 bottles of juice, brown bread with peanut butter”.

What type of food do you normal indulge in from the tuck-shop”?

Learner 3(3) : “I usually buy stock sweets, snacks, kota and fat cakes”.

Learner 4(3) : “I buy kota should have a lot of sauces, afat cakes, red cake and sweets and a lot of sweets,

Learner 5(3) : “I normal buy a kota, 2 stock sweets, 4 snacks”.

Learner 6(3): “I do not bring a lunch box to school; I eat from the feeding scheme and only buy soft drink lama amabhujwa”.

Learner 7(3) : “I buy kota with atcher, soft drink and stock sweets”.

Learner 8(4) : “I carry R20, buy kota, if I do not get full I buy a Chelsea bun”.

Learner 9(5) : “I usually eat different type of snacks which I bring from home, cracker, kip-kip, scoppers, and amabhujwa, chocolates and biscuits and sometimes buy quarter, red cake and I litre of coke from the tuck-shop”.

Learner 10(6): “I will buy snacks and sweets.

In a typical week which meals do you take part with your family? How regularly?

Learner1(3) : “We have breakfast and supper together every day, we serve vegetables such as pumpkins, cabbage spinach, carrots and also fruits but we are not forced to eat them.”

Learner 2(3) : “We sometimes eat together on Saturdays; we also serve vegetables such as pumpkin, potatoes and fruits such as pawpaw, and yoghurt”.

Learner 3(3) : “We do not sit together and eat, we are always busy, and everyone prepare his /her own food. We normally have pap, sausages; vegetables

such as cabbage and spinach are always there. Fruits are sometimes available. I do not like avocado, I do not eat vegetables".

Learner 4(3) : "We do not eat together, I am the only child at home, we eat pap, mohodu, and I do like spinach and cabbage and grapes".

Learner 4(4) : "We only eat together breakfast and supper; it is a must that we sit on the table. I total do not eat vegetables but I love bananas and apples".

Learner 5(4) : "I eat alone in my bedroom; it is only me and my brother, so we always avoid each other".

Learner 6(5) : "Usually we eat as a family during the week, on sat sometimes breakfast. In terms of fruits I like bananas, apples and oranges".

Learner 7(5) : "We eat supper together every day, consisting of pap, meat. I do not eat vegetables at all, am allergic to bananas but I do eat apples and litchis."

Learner 8(5) : "I usually eat alone, only eat lasagna, I do prepare it, I do not prepare vegetables but I do eat them. I do not like fruits but I do eat fruit yoghurt".

In light of the uncertain whether conditions which beverages do you drink?

Learner 1(3) : "I do take beers, Heineken, Smirnoff and soft drinks".

Learner 2(3) : "hot chocolate, soft drinks and hinter gold, I also love tea".

Learner 3(3) : "I love soft drinks"

Learner 4(3) : "tea, water soft drink, but soft drink are not good, I think I should remove them from my diet.

Learner 5(3) : "I like coffee, tea and coke"

Learner 6(3) : "I love black tea with 8 sugars, I hate soft drinks".

Learner 7(3) : "I like tea and iron brew, coffee with 3 sugars".

Learner 8 (3) : "I prefer hot chocolate".

Have you noticed any change in your eating habits since you enrolled at the school? If so what do you t attribute this change to which disease do you think are attributed to eating habits?

Learner 1 (3) : "I have not changed my eating habits, am too young to be changing eating habits. I think high blood pressure is cause by lots of salt.

Learner 2(3) : "My eating habits have changed, was not carrying anything to school. In term of diseases, poor eating habits cause diabetes, high blood pressure and obesity".

Learner 3(3) : *"I think my habits changed for the worst, I like food. Poor eating habits cause obesity".*

Learner 4(3) : *"My eating habits changed, I did not carry a lunch box at primary but now I do carry lunch and no longer having cool drinks".*

Learner4 (3): "My eating habits have changes; I even eat atcher, kota which I am sure causes high blood pressure."

Learner 4(3) : "My eating habits changed. At primary school used to eat alone, now I have to share with friends, sometimes I do not get full. Too much salt causes high blood pressure".

Learner 5(3) : "My eating habits changed, at primary school used to eat from the feeding scheme but since I came here I have stopped. Poor eating habits cause high blood pressure".

Learner 6 (3) : "I now eat from the feeding scheme, the diseases caused by poor eating habits re diabetes and obesity".

Learner 7 (3) : "I used to eat a lot of chillies now it has caused me pile".

Learner 8 (3) : "My eating habits have changes; I no longer carry a lunch box to school".

Learner 9 (3) : " I used to carry a lunch box at school, consisting of chicken sandwich, with cheeses and 100% juice at primary school but now I carry pocket money which I normal use to buy junk flood. I think parents should force us t carry lunch boxes and not give us money because the food we carry in lunch boxes is usually healthier".

Which sporting activity are you engaged with at school

Learner 1(3) : "Sports is not offered at school, I used to do athletics and netball, now it stopped, so we play volley ball during break time."

Learner 2(3) : "There are no sporting activities, but I do not do sport anywhere".

Learner 3(3) : "No sports at school but I do run with my sisters every day at 6pm".

Recommendations and suggestions

Learner 1(3) : "the school governing body should bring back sporting activities".

Learner 2(3) : "We should as adolescents eat healthy an exercise, and refrain from eating junk food".

Learner 3(3) : "Junk food attracts people, so it will be difficult to stop operating it".

Learner 4(3) : "The tuck-shop should sell health food which includes fruits and we should also eat from the feeding scheme".

Annexure F Selected school-based strategies to promote healthy eating among high school students

Strategies to make the food environment more healthy - Enhancing (US Department of Health and Human Services 2010).

- Make healthy foods widely available at school; discourage the availability of foods high in fat, sodium, and added sugars.
- Provide role models (e.g., teachers, parents, other adults) for healthy eating.
- Use peers as role models and use peer-led nutrition education activities.
- Provide social support for making healthy changes in eating and physical activity through class discussions and small-group activities.
- Provide cues, through posters and marketing-style incentives that students design, that encourage students to make healthy choices regarding eating and physical activity.

Strategies to enhance personal characteristics that will support healthy eating.

- Explain the effects that diet and physical activity have on future health as well as on immediate concerns (e.g., physical appearance, obesity, disordered eating, capacity for physical activity, and health and wellness).
- Have students identify reasons to adopt healthy eating and physical activity patterns.
- Teach the principles of the Dietary Guidelines for Americans. Help instill pride in the students when they choose to eat meals and snacks that comply with these principles.
- Teach students how to identify foods high and low in fat, saturated fat, cholesterol, sodium, and added sugars.
- Teach students how to identify foods that are excellent sources of fiber, complex carbohydrates, calcium, iron, vitamin A, vitamin C, and folate.
- Teach t importance of balancing food intake and physical activity.
- Teach the effects of unsafe weight-loss practices and the characteristics of a safe weight management programme.
- Help students increase the value they place on health and their sense of control over food selection and preparation.
- Increase students' confidence in their ability to eat healthfully by gradually building their skills and providing numerous opportunities to practice the skills.

- Help students examine what motivates individuals to adopt particular eating habits. Have them keep a food diary in which they track what they eat/drink during a typical week and identify what prompts their own eating behavior (e.g. emotions, hunger, stress, or social situations).

Strategies to enhance behavioural capabilities that will support healthy eating

- Provide opportunities for students to plan and prepare healthy meals.
- Have student's select healthy foods from restaurant and cafeteria menus.
- Teach students how to use nutrition labels to make healthy food choices.
- Teach students how to modify recipes and prepare foods to reduce fat, sodium, and sugar, and to increase fibre content.
- Help students identify incentives and reinforcements for their current eating and physical activity behaviours.
- Have students examine media and social inducements to adopt unhealthy eating and physical activity patterns. Teach them how to respond to these pressures, and let them use their new knowledge and skills to identify their own resistance techniques.
- Have students analyse environmental barriers to healthy eating and physical activity; explore strategies for overcoming these barriers.
- When appropriate, give students practice in encouraging parents to make healthy choices about eating and physical activity at home.