

Knowledge and Practice of Tswaing High School Learners regarding diet, nutrition and exercise

DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE MASTER OF PUBLIC HEALTH DEGREE AT THE NATIONAL SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF LIMPOPO (MEDUNSA CAMPUS)

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## **CANDIDATE'S DECLARATION**

I, **Segametsi Virginia Ingrid Letlape**, do hereby declare that this research is my original work and that to the best of my knowledge and belief, has not previously been submitted to any other institution of higher learning or subject for evaluation. All sources used or quoted in this document are indicated and acknowledged.

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## **DEDICATION**

This research study is dedicated to my mother, Mrs Liza Molamu, who passed on in 1998 from complications of diabetes, hypertension and asthma (non-communicable diseases), and to all NCD patients. I also dedicate this study to my whole family in recognition of their continued support, encouragement, motivation and understanding throughout the period of my studies. Without them I would not have made it. To my husband, Malesela, and the children Thoriso, Kutloano and Tshepiso Letlape: thank you very much.

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## **ABSTRACT**

Despite an increased focus on adolescents' diet, nutrition and exercise in South Africa over the past years, their dietary intake remains a major cause for concern, with increasing numbers consuming high fat and high sugar foods on a daily basis. The consumption of these foods may be due to industrialization as processed foods are less expensive, easily accessible and do not require time and energy in their preparation.

Health education intervention can play a major role in spreading health messages on prevention and management of non-communicable diseases. Health education should start at school, as many personal habits and life-style choices are made early in life.

The objectives of the study were to identify and describe learners' knowledge and practise of a healthy diet, daily nutritional requirements and the importance of regular exercise. This is a cross-sectional survey using a self-administered questionnaire with closed and open-ended questions. Tswaing High School was used as a study site and the sample comprised all learners who were present on the day of study and who had submitted the consent form from their parents (485 learners or 69.3%).

Seventy-seven percent of learners scored under 50% on the test that was administered and only 23% of learners had a satisfactory knowledge of diet, nutrition and physical activity, and 41.3% of the respondents reported that they were sedentary for hours.

Learners of Tswaing High School do not possess adequate knowledge of nutrition and diet. The government departments such as education, sports, arts and culture, and health should implement

programmes that will inform learners about the importance of nutrition, diet and exercise in their lives.

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## Definition of terms

Exercise	All movements in everyday life, including going to school by foot, fetching water from a nearby tap, exercise and sporting activities such as playing netball, soccer, volleyball, athletics and participating or practising gymnastics.
High school	A public or independent school that enrolls learners in one or more grades from grade 10 to 12 (Department of Education, South Africa, 2003).
Learner	Any person receiving education or obliged to receive education in terms of the South African Schools Act, 1996 (Act No. 84 of 1996) (Department of Education, South Africa, 2003).
Life-Orientation	A school subject which focuses on the study of self in relation to others and to society. It is concerned with personal, social, intellectual, emotional, spiritual, motor and physical growth and the way in which these dimensions are interrelated and expressed in life (Department of Education, South Africa, 2003).
Grade	That part of an educational programme which a learner may complete in one school year, or any other education programme which the Member of the Executive Council may deem to be equivalent there. (Department of Education, South Africa, 2003).

## CHAPTER 1 – INTRODUCTION

Nutrition, diet and exercise are as old as human kind. During the era of primitive farming, community members used manual labour to plough and harvest their plantations. In so doing parents played a role in ensuring that their children eat nutritious food, follow a particular diet and help out in the fields as part of physical activity. The next era that followed primitive farming was commercial farming. This has led to overproduction of food products. Most of the parents were not at home to monitor their children's eating habit and manual labour activities were reduced.

The beginning of industrialization and urbanisation has led to the birth of modern societies that seems to be converging on a diet high in saturated fats, sugar and refined food but low in fibre and on lifestyles characterised by lower levels of activity (Popkin and Gordon-Larsen, 2004). Societies were then exposed to risk behaviours such as unhealthy diets and physical inactivity. Regular exposure to these risk behaviours has led to people acquiring non-communicable diseases.

It is predicted that, globally, deaths from non-communicable diseases will increase by 77% between 1990 and 2020 and that most deaths will occur in the developing regions of the world (South African Medical Research Council, 2005). The four non-communicable diseases that pose the greatest threat to our well being are cardiovascular disease, cancer, obstructive pulmonary diseases and type-2 diabetes. Unhealthy diet and physical inactivity are regarded as being the leading causes of these major non-communicable diseases (World Health Organization, 2004).

In South Africa, the burden of non-communicable disease risk factors is high: approximately six million people suffer from hypertension, four million have diabetes, and seven million smoke and four million have hyper-lipidaemia. About 56% of the population has at least one of these risk factors: about 20% present a high level of risk for non-communicable diseases. Clearly, lifestyle changes and medical care are required in order to reduce the projected burden of these diseases (South African Medical Research Council, 2005).

In 2000, over 55% of South Africans aged between 15 and 64 years were at risk of chronic diseases of lifestyle while 16.5% were at high risk of various other chronic diseases (Steyn, Senekal, Brits & Nel, 2000). This high risk of chronic diseases of lifestyle makes it clear that South Africa needs public health intervention. The promotion of healthy diet and physical education is vital if we are to reduce the rate of morbidity and mortality from chronic diseases caused by an unhealthy lifestyle. Health promotion programmes must be planned in such a way that they target specific at-risk groups in the community. According to Steyn and Temple (2006), an essential part of the prevention and management of all Chronic Diseases of Lifestyle (CDL) is the promotion of a healthy lifestyle that includes not smoking, following a healthy diet and leading a physically active life. Such promotions should involve all media communications and other channels, such as school education curricula and programmes at all health facilities.

Globally, schools have been advised to participate in combating the morbidity and mortality rate among adolescents by promoting a healthy lifestyle and equipping young people with the skills to adopt such lifestyles (World Health Organization, 2004). It is estimated that adolescents make up roughly 20% of the world's total population and it is further projected that by the year 2025, their numbers will reach 1.13 billion. The adolescent population in Africa is expected to grow much more rapidly than that of Asia and Latin America (World Health Organization, 2005).

Adolescence is regarded as a transition period between childhood and adulthood, during which adolescents can be taught how to mend the disparities of the past and use them to the good of the future (World Health Organization, 2005). It is a period that provides a window of opportunity for nutrition and is regarded as a timely period for the adoption and consolidation of sound dietary habits. Improving adolescents' nutritional behaviour is an investment in adult health and there is potential for correcting nutritional inadequacies and perhaps even for catch-up growth. An intervention among adolescent girls may contribute to breaking the vicious cycle of intergenerational malnutrition, poverty and chronic disease; and it is possible to reach households and communities through adolescents (World Health Organization, 2005).

## 1.1. Background

The South African public education system accommodates 12 217 765 school learners of which 2 447 412 are learners at high school, i.e., learners in grades 10 to 12 (Statistics South Africa, 2007). The majority of high school learners fall within the range of adolescence, which is from 12 or 13 to 18 or 19 years of age. Promoting health in schools is particularly attractive given the frequent and consistent ( $\pm$  five hours for five days) contact between teachers and learners over a period of twelve years.

During the apartheid era, great disparities existed between ethnic groups and the various education systems. Very little was done in the Bantu Education system to inculcate the importance of physical activity and nutrition. Although teachers were trained in physical education at training colleges, very few were given the opportunity to teach this at school level because there were seldom proper grounds (sports fields), resources or policies in place with regard to physical activity at school level. Schools tended to use physical education periods as free periods and sometimes learners were sent out to the grounds to play without the supervision of the physical education teacher. No framework to monitor and evaluate the implementation of physical activity programmes existed at school level, as Lambert *et al.* (2001) confirm. These researchers report that physical activity and health promotion initiatives in sub-Saharan Africa were fragmented with little central government coordination.

When the democratically elected government came into power in South Africa in 1994 it had to unify the 19 departments of education that had existed in the apartheid era into one Department of Education. This department had to formulate policies that would create uniformity in the education system. Curricula were implemented to end disparities that had existed. In 2002, the Revised National Curriculum Statement was introduced for learners in Grade R-9, the General Education and Training Band (GET). Life-Orientation, which was a new learning area (subject) at GET level, was introduced. One of the objectives of this learning area was to develop skills, knowledge, values and attitudes that would empower learners to make informed decisions and to take appropriate action regarding health promotion (Department of

Education, South Africa, 2002). Five learning outcomes were designed: Learning Outcome One is Health Promotion (Department of Education, South Africa, 2002).

The National Curriculum Statement for high school learners was introduced in 2005. Learners who have been admitted to high schools since 2006 will have been exposed to the Revised National Curriculum Statement for three years prior to their admission to Further Education and Training (FET). They know about nutrition and physical activity but the extent of this knowledge is not clear. In this study the researcher will evaluate learners' knowledge and practices in diet, nutrition and physical activities with the aim of introducing proper diet, nutrition and physical activity programmes as stipulated to members states at the 57<sup>th</sup> World Health Assembly. It is also important that Life-Orientation teachers are aware of what learners know about diet, nutrition and exercise in order to correct nutritional inadequacies. As adolescence is regarded as a period of rapid growth, some learners could be helped to catch up the growth deficit of childhood in a school setting.

Winterveldt is an informal urban settlement and a smallholding area of approximately 9500 hectares. It is situated about 40 km north-west of Pretoria, adjacent to Mabopane (Population (Background), South Africa, 2003). Until recently it formed part of the North West Province, but in 2007 the area was incorporated into Gauteng Province. There is no piped water to some of the houses, and they use pit toilets. There is no refuse removal in the area. Between forty and forty-five percent of the population is unemployed. Approximately one third of the population is Tswana-speaking and the remainder speaks a wide variety of languages (Population (Background), South Africa, 2003).

Winterveldt has two government health facilities, Kgabo Health Centre and Dube Clinic. Both facilities offer a 24-hour, fully comprehensive service, with a maternity unit and a medical practitioner on a session basis. Four non-governmental clinics also operate in Winterveldt, namely, Sisters of Mercy, St Peter's, St Joseph's and Thusong (Population (Background), South Africa, 2003). In an area of this size with this many inhabitants and only two governmental clinics there is definitely a need for schools to play a role in health promotion.



## 1.2. Problem Statement

Adolescents in this country are exposed to a variety of foods but they do not have information on which or how much food to eat in order to follow a healthy lifestyle. They are also exposed to various sporting activities but they do not always understand the significance of participating in these sports. Inadequate knowledge of nutrition, diet and exercise has a detrimental effect on their health and the results are irreversible. By making these learners aware of the dangers of unhealthy eating and physical inactivity schools could contribute to a reduction of morbidity and mortality from chronic diseases caused by unhealthy lifestyles. This is a public health issue.

Adolescents in Winterveldt are constantly exposed to risk behaviours such as malnutrition. There is also a high number of people infected with and dying from HIV/AIDS in the community. Most of the parents in the area are unemployed and cannot afford to provide their children with a balanced diet. Of those who are employed, many do not live with their children and this means that adolescents frequently lack guidance and information on nutrition and exercise.

As an informal settlement, Winterveldt does not have adequate “green space” for adolescents. There are no recreational facilities such as gymnasiums, “user friendly” sports grounds or properly constructed, tarred roads. This has meant that many of the schools in the area do not participate in sports that are organised by the local school sports association. The rate of unemployment in the area also affects the participation of learners in these activities because they do not have the correct sports attire, among other things. The purpose of this study is to determine whether learners are aware that a lack of exercise poses a risk to their health.

Schools’ tuck shops in the area are privately owned. These tuck shops mostly sell fizzy drinks, *sephatlo* (a quarter-loaf of white bread filled with atchaar, fried chips and polony), sweets and ice-pops to the learners during lunchtime. This kind of meal is high in fat, sugar and processed meat. Tuck shop owners have not been provided with guidance as to what food they should sell to learners. Food safety (hygiene) is not observed in the area and learners often buy their food from street vendors, unaware of

how and when the food has been prepared.

As the researcher is a Life-Orientation Educator at Tswaing High School in Winterveldt, she is concerned with her learners' knowledge and practice on nutrition, diet and exercise. For her to prepare relevant and correct lessons for her learners, she needs to conduct baseline assessment on them so as to establish what the learners already know and can do. Life Orientation as a subject has four Learning Outcomes for Grade 10 to 12 of which the third one is recreation and physical wellbeing. The objective of Learning Outcome 3 for all the grades is that the learner must be able to explore and engage responsibly in recreation and physical activities, to promote wellbeing. An Educator must prepare lessons on knowledge of healthy practices and nutrition, participation in games, sports and leisure time activities and the environment that can improve the quality of life and well being of all learners. Each grade has its own Assessment Standard under Learning Outcome 3.

### **1.3. The aim of the study**

The aim of this study is to assess knowledge and practice the diet, nutrition and exercise knowledge and practices of learners at Tswaing High School, Winterveldt.

### **1.4. The objectives of the study**

The objectives of the study are to identify and describe the learners':

- 1 Knowledge of the constituents of a healthy diet, their daily nutritional requirements and the importance of regular exercise.
- 2 To identify the learners' nutrition, diet and exercise practise.

## **CHAPTER 2 – LITERATURE REVIEW**

### **2.1. Introduction**

The results of the Youth Risk Behaviour Survey that was conducted to the South African youth in 2002 has led to many organisations such as the Medical Research Council, Higher institutions such as universities, researchers and government departments to work together in coming up with strategies or health promotion programmes that will help in reducing the risk behaviours of the youths in the country. Despite an increased focus on diet, nutrition and exercise among adolescents in South Africa over the past years the dietary intake of young people in this country remains a major cause for concern, with increasing numbers consuming high fat and high sugar foods on a daily basis (World Health Organization, 2003). This was confirmed in a speech delivered by the Minister of Health in 2004. Manto Tshabalala-Msimang said that 39% of South African youth frequently consumed fast food, 29% did not take regular exercise, and 17% were overweight or obese. She added that one in four learners watches television for more than three hours a day. Poor nutrition, obesity and low levels of exercise not only have an immediate impact on the health of adolescents but also contribute to adult susceptibility to diabetes and coronary heart disease. The solution lies in changing these behaviours and making learners more active and more knowledgeable about healthy diet and nutrition (Department of Health, South Africa, 2004).

### **2.2. Diet, nutrition, physical activities and epidemiologic transition**

Urbanization has played a major role in demographic and epidemiologic transition (World Health Organization, 2002). This is confirmed by Popkin and Gordon-Larsen (2004) in a paper in which they link nutrition transition to both epidemiologic and demographic transition. Urbanization is an example of social change that has had a significant effect on diet in the developing world (World Health Organization, 2002). According to Bygbjerg and Meyrowitsch (2007), Omran in 1971, has formulated five factors of major importance for transition in his “Theory of the Epidemiology of Population Change”. He lists as the second factor a long-term shift in mortality and

disease patterns in which pandemics of infection are gradually displaced by degenerative and man-made diseases as the chief form of morbidity and primary cause of death (Omran, 2005). This long-term shift has been experienced in developed countries and it is predicted that it will be or is already being experienced in developing countries during the period of urbanization and industrialization.

South Africa is undergoing a process of rapid epidemiological transition, revealed in patterns of health and disease as communities transform their social and economic structures (Chopra & Sanders, 2004). One of the consequences of urbanization is an increase in chronic diseases of lifestyle such as obesity, hypertension and diabetes mellitus. Many of these are related to changes in lifestyle, particularly in dietary intake (Steyn et al., 2000; Kruger, Puoane, Senekal & van der Merwe, 2003). This is confirmed by Steyn et al. (2006) and Kruger et al. (2003), who further suggest that in order to deal with the escalating problem of chronic disease in the next decade, health authorities should develop successful intervention programmes aimed at health promotion among children. Steyn et al. (2006) suggest that the school environment be exploited as a vehicle for change and adoption of a healthy lifestyle; however, they do not outline health promotion programmes that could be implemented at school level.

In South Africa, similar to other developing countries, the mortality rate due to certain infectious and parasitic diseases was 26 % in 2006 (Statistics South Africa, 2008). If effective and more expensive health promotion and prevention strategies are not implemented in the country, the mortality rate from non-communicable diseases will soon overtake that of infectious diseases. There is an urgent need for research into these diseases which kill thousands of children, mothers and young adults each year (Bygbjerg & Meyrowistch, 2007).

Developing countries are currently experiencing an overproduction of oilseeds, vegetable oils, caloric sweeteners and animal source foods because of cheaper transport and communication as a result of industrialization (Popkin & Gordon-Larsen, 2004; World Health Organization, 2002). Furthermore, countries have experienced shifts in diet and physical activity patterns. With this overproduction, unhealthy foods are globally more easily accessible even by the poor, and cheaper transport and communication have led to physical inactivity. These shifts have had an

impact on the health of the workforce of these countries. Because of the high burden of these diseases, researchers have been urged to conduct studies in an attempt to curb the high rate of morbidity and mortality.

### **2.3. World Health Organization views on diet, nutrition and physical activity**

With the increased consumption of unhealthy foods and a lack of physical activity, major risk factors for non-communicable diseases, the World Health Organization has been prompted to propose global recommendations that should be taken into consideration when developing national policies on health promotion and prevention strategies to reduce morbidity and mortality from chronic diseases (World Health Organization, 2002).

The Global Strategy on Diet, Physical Activity and Health discusses, amongst others, the challenges that developed countries have experienced, what developing countries are experiencing because of the major risk factors, the goals and objectives, evidence for action, and principles and responsibility for action. Furthermore, it suggests that schools influence the lives of most children. Schools should protect children's health by providing health information, improving health literacy, and promoting healthy diet, physical activity, and other healthy behaviour (World Health Organization, 2002). In order to promote healthy diets at school level, a diagnostic assessment must be conducted.

### **2.4 Diet, nutrition and exercise guidelines for South African adolescents**

During the 57<sup>th</sup> World Health Assembly, it was suggested that if countries are to develop national policies that will assist in reducing the morbidity and mortality rate of chronic diseases, they should take the recommendations that were made into consideration (World Health Organization, 2002). Countries need to take into account their local situation when preparing for their national guidelines. The South African Food-Based Dietary Guidelines (FBDGs) were developed in 2001 by a joint initiative

between the Nutrition Society Association for Dietetics in South Africa, Medical Research, industry and the Department of Health. There are ten FBDG messages:

1. Enjoy a variety of foods.
2. Be active.
3. Make starchy foods the basis of most meals.
4. Eat plenty of fruit and vegetables.
5. Eat dry beans, peas, lentils and soya regularly.
6. Meat, fish, chicken, milk and eggs may be eaten every day.
7. Eat fats sparingly.
8. Use salt sparingly.
9. Drink plenty of clean, safe water.
10. If you drink alcohol, drink sensibly.

These guidelines are to be used as a basis for the planning, implementation and evaluation of the public health nutrition strategy. They were used to determine the diet, nutrition and exercise knowledge of learners at Tswaing High School because, according to Vorster, Love and Browne (2001), the guidelines should form the basis or benchmark of nutrition education in Primary School Nutrition.

## **2.5. Studies on adolescent diet and nutrition knowledge and practices**

Most research into the nutritional knowledge of children over the age of five has not analysed results according to age, prompting the need to assess the knowledge and practise of adolescents on diet, nutrition and exercise.

Walsh, Dannhauser and Joubert (2003) conducted a study that included a sample of 608 respondents within different communities. A positive impact from the nutrition education programme was observed in the intervention group but no improvement in nutritional knowledge or dietary practices was observed in the control group. This suggests that people in the community lack adequate knowledge of nutrition. Furthermore, the results suggest that community-based nutrition education

programmes can contribute to knowledge of balanced, economical nutrition and dietary practices in low-income communities. This study included respondents between the ages of sixteen and one-hundred-and-nine years old: it did not focus on a particular age group. Thus the results of the study cannot be generalized to all adolescents in the country.

A similar study was conducted by Steyn et al. (2000) on black female students at the University of Limpopo, Turfloop Campus. These students were from both rural and urban areas. The researchers found that nutritional knowledge was generally poor and dietary intervention was recommended. In studies by both Walsh et al. (2003) and Steyn et al. (2000), nutritional knowledge was poor and the authors emphasized the importance of nutrition education as part of intervention strategies. But how can one introduce nutritional strategies to learners when their nutritional, diet and physical activity knowledge and practices are unknown?

The 1<sup>st</sup> South African Demographic and Health Survey was conducted in 2003/04 on a sample of 10, 000 households in nine provinces. The results showed that the overall nutrient density of the diet consumed by adolescents was poor. More than 50% of adolescents had a value of less than 67% of the recommended daily dietary allowance (RDA) for calcium, folate, magnesium, vitamin E, thiamine, niacin and iron. Furthermore, more than 60% were getting less than 33% of the RDA for calcium. However, the comparable results obtained in the first South African National Youth Risk Behaviour Survey (2002) were that, nationally, 9% of learners were underweight, 11. 4% had stunted growth, 4% suffered wasting of muscles and 17.4% were overweight. These results indicate that there is a desperate need for health promotion intervention among adolescents in this country. Health prevention strategies need to be relevant to learners like those who attend Tswaing High School.

However, both the first South African National Youth Risk Behaviour Survey and the first South African Demographic and Health Survey concentrated on the practices of adolescents in nutrition, diet and physical activity and overlooked the importance of adolescents' knowledge of nutrition, diet and physical activity. Anthropometric measurements (such as height and weight) were used to construct indices for malnutrition that were then compared to reference values or standards (Reddy et al.,

2007). The North West Province had the highest prevalence of underweight adolescents and wasting of muscles and a letter written by Mokwena (2003) in Dietician reveals that there is lack of adequate knowledge of personal anthropometrics among high school learners in the North West Province. This calls for educational intervention.

## **2.6. The school as setting for intervention**

In 1996, WHO launched the Global School Health Initiative (GSHI) which aims to increase the number of schools that can be called “health promoting” schools (HPS). A HPS is defined as a school that “constantly strengthens its capacity as a healthy setting for living, learning and working” (World Health Organization, 2002). Schools provide a site that has the potential to reach large numbers of adolescents (Department of Health, South Africa, 2001). The overwhelming majority of South African adolescents attend school. There are other advantages that schools have over health facilities as sites of health promotion efforts. First, there is the potential to reach large groups of adolescents in an efficient manner. Second, the students attending a school are to a large extent constant from day to day (Department of Health, South Africa, 2001). Health facilities cannot provide these advantages to adolescents or community members. This was confirmed by a study conducted by Booysen (2003), where a relatively large percentage of adult respondents (65%) had not visited any health care facility in the past month.

Schools offer many opportunities to promote healthy dietary and physical activity patterns for children and are also a potential access point for engaging parents and community members in preventing their own and school-age children's and adolescents' malnutrition in all its forms, i.e. under-nutrition, micronutrient deficiencies, obesity and other nutrition-related chronic diseases. The universality of the school setting for gaining access to children makes it highly relevant to global efforts to combat the public health problems increasingly presented by the double burden of under- and over-nutrition (World Health Organization, 2006).

The aim of Nutrition Friendly Schools Initiative (NFSI), which was developed as a



follow up to the WHO Expert meeting on childhood obesity in Kobe on 20-24 June 2005, is to provide a framework for designing integrated school-based intervention programmes which address the double burden of nutrition-related ill health, building on and interconnecting the ongoing work of various agencies. Evidence from around the world shows that treating nutritional and health conditions at school can improve academic performance (World Health Organization, 2006).

## **2.7. Summary of review**

The review of literature on the diet, nutrition and exercise knowledge and practices of South African adolescents has revealed that intervention at school level is required.

Conducting a situation analysis is essential for the development of policies on healthy eating and physical activity in schools (World Health Organization, 2008). A baseline assessment of the reality in the school setting will be made by using quantitative information to determine needs and to plan healthy eating and physical activity interventions in schools.

## **CHAPTER 3 – METHODOLOGY**

This chapter will focus on the methodology followed in collecting data from the respondents.

### **3. 1. Study design**

This study is a cross-sectional survey using a self-administered questionnaire with closed and open-ended questions. Learners were required to fill in their demographical information, to answer questions on their knowledge of nutrition and physical activity and on their physical exercise practices.

### **3.2. Study population**

The study population were all learners of Tswaing High School.

### **3.3. Sample**

All learners who were present on the day of the study.

### **3.4. Inclusion criteria**

All learners who gave consent and who were present at school on the day of the study were included. In the case of underage learners, parental consent was required. Learners were given consent forms to give to their parents. They were asked to bring them three days after the day of issue. Consent forms were issued on the 11 October 2006 and were returned as from the 14 October 2006 until the 18 October 2006.

### **3.5. Data collection instrument**

A self-administered questionnaire was used to assess diet, nutrition and exercise knowledge and practices of learners attending Tswaing High School in Winterveldt. This questionnaire, developed by Whati, Senekal, Steyn and Nel (2005, *Nutrition* 21:

76-85) is referred to as the Nutrition Knowledge Questionnaire for 13 – 19-year-olds, based on food-based dietary guidelines. Learners answered questions based on the eleven South African Guidelines, namely:

1. Enjoy a variety of foods.
2. Be active.
3. Make starchy foods the basis of most meals.
4. Eat plenty of fruit and vegetables.
5. Eat dry beans, peas, lentils and soya regularly.
6. Meat, fish, chicken, milk and eggs may be eaten every day.
7. Eat fats sparingly.
8. Use salt sparingly.
9. Drink plenty of clean, safe water.
10. If you drink alcohol, drink sensibly.
11. Use sugar sparingly.

This is a valid and reliable nutrition knowledge questionnaire that was developed for urban South African adolescents participating in the Birth-to-Twenty cohort study. In addition, the researcher designed a questionnaire with seven questions on three variables, namely time spent sitting, walking and the extent of daily physical activity.

The questionnaire was in English, the medium of instruction at the school in question. The questionnaire was administered in a classroom situation. On the day when the consent forms were issued to the learners, the researcher was given chance to address learners about her study. She explained what the consent form was and briefly communicated the objective of the study to the learners. On the day of the study that is on the 18 October 2006 learners were asked to complete the questionnaire anonymously to ensure confidentiality. They were asked to answer honestly so as to give a true reflection of their knowledge of and practice in diet, nutrition and exercise.

Since the school had 21 classes and the researcher was given a certain period of time to conduct the study, the services of other teachers were required. The third and fourth periods of the day were used because during that time learners were settled and there would be no late-comers. Teachers were informed about the study and each teacher who was on duty in the third period issued the questionnaire to the learners. The

teacher in charge of the learners read out the cover page in order to communicate the objective of the study.

The duration of each period is forty-five minutes and the duration of the questionnaire was one hour. They were asked to observe the rules and regulations of invigilation as stipulated by the Department of Education. Teachers collected all the questionnaires at the end of the study. The questionnaires were then submitted to the researcher for safekeeping.

### **3.6. Data collection**

A letter from the researcher requesting permission for learners to participate in a study at the school and a clearance certificate from the Research Ethics Publications Committee of the National School of Public Health approving the project were hand delivered to the principal of Tswaing High School. In a meeting held on the same day, the principal confirmed that he had been telephonically mandated by the Area Project Office Manager to grant the researcher permission to conduct the study. The school principal was informed about the consent forms which learners would ask their parents to complete. Learners were given a period of three days to return the signed consent forms. The researcher collected these forms from the school. A date for the study was agreed upon by the researcher and the principal. Data was collected on the 18 October 2006

### **3.7. Data analysis**

Completed questionnaires were stored safely in a locker by the researcher. The researcher recorded the total number of questionnaires collected. Questionnaires that had not been correctly filled in and those which were incomplete were destroyed. Only the 485 questionnaires that had been correctly and fully completed were used for statistical analysis.

The researcher used the SPSS software program to calculate descriptive statistics

(frequencies). The mean age of the learners, the number of learners who had responded correctly to the nutrition and exercise questions and the number of learners per grade who participated in the study were calculated. The researcher also calculated the frequencies of learners living in particular areas, the number of people working in the family, who cooks in the family and the number of learners who live near a soccer field.

In addition, a norm-referenced performance-rating scale was used for the nutrition knowledge questionnaire. The knowledge of learners in this study was categorised according to the norm-referenced performance-rating scale developed by Whati *et al.*, 2005.

**Table 1: Norm-referenced performance-rating scale for the nutrition knowledge questionnaire.**

Stanine Performance	Score (%)	Interpretation
1	<34	Very Poor
2-4	34 -51	Fair/Below Average
5	52 -57	Good/Average
6-9	58 – 75	Very Good/ Above Average
9	76 +	Excellent

Source: Whati, Senekal, Steyn & Nel (2005)

### **3.8. Ethical issues**

Ethical Approval for the study was obtained from the Research, Ethics and Publications Committee (REPC) of the National School of Public Health, University of Limpopo. The project number NSPH/ST2006/15 was provided at a meeting held on 24 August 2006.

Permission to conduct the study was granted by Mabopane Area Project Office and the principal of Tswaing High School. Letters of consent were issued to the learners and the researcher explained the content of these letters to them. Learners were asked to return the consent letters within three days. The researcher collected the consent letters and learners were given the date on which the study would be conducted.

### **3.9. General Remarks**

By the day of the study most of the learners had not returned their consent forms. Some promised to bring them the following week but this did not happen. Many learners were not living with their parents, while some parents only came home at weekends, or once a month or so. This made it impossible for the researcher to include all the learners at the school.

There was also reluctance on the part of some learners to participate in the study and several did not come to school on the day that had been agreed upon. Others did not complete the questionnaire, submitting it with only the demographic information filled in.

The above-mentioned eleven guidelines were used to determine the diet, nutrition and exercise knowledge of learners at Tswaing High School because, according to Vorster, Love and Brown (2001), these guidelines should form the benchmark of nutrition education in the Primary School Nutrition Programme and the national education curriculum of the Department of Education.

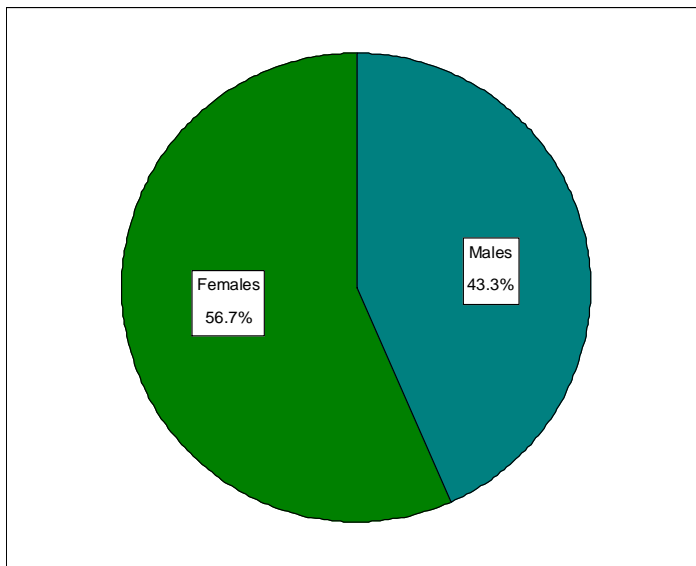
## CHAPTER 4 – RESULTS

The researcher analysed data collected from the learners using the software program SPSS 11.0 for Windows Student Version. The statistics provided below were obtained from the analysis of the demographical data.

### 4.1. Number of learners who participated

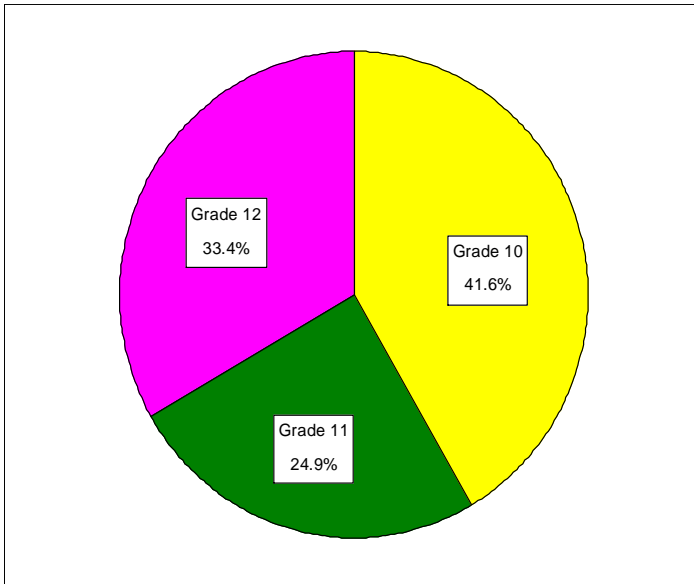
485 questionnaires were correctly and completely filled in and subjected to statistical analysis. The study sample comprised 209 (43.3%) boys and 276 (56.7%) girls.

**Figure 1: Classification of learners according to gender**



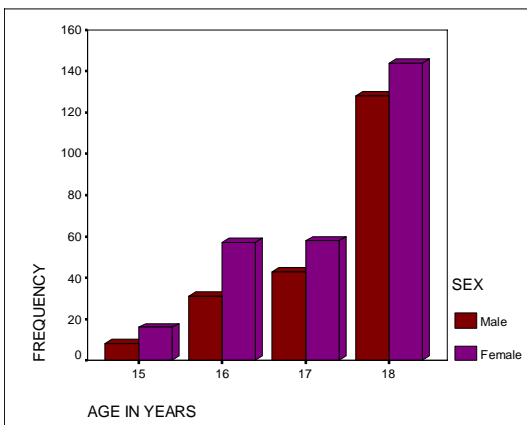
When classified according to their grades, 202 (41.6%) of participants were grade 10 learners, 121 (24.9%) were grade 11 learners and 162 (33.4%) were grade 12 learners. The majority of the participants were in grade 10, followed by grade 12 and lastly by grade 11.

**Figure 2: Total number of learners according to school grades**



In this study 272 (56%) of the participants were 18 years old, 101 (21%) were 17 years old, 88 (18%) 16 years of age and 24 (5%), 15 years old. The mean age of participants in the study is 17 years.

**Figure 3: Classification of participants according to age and gender**



#### **4.2. Classification of learners according to residential area**

A total of 393 (81%) of the learners who participated in the study reside in Winterveldt. 53 (11%) learners reside in Soshanguve, 11 (2%) learners reside in Mabopane, 9 (2%) learners reside in each of the following areas, Eesterus and

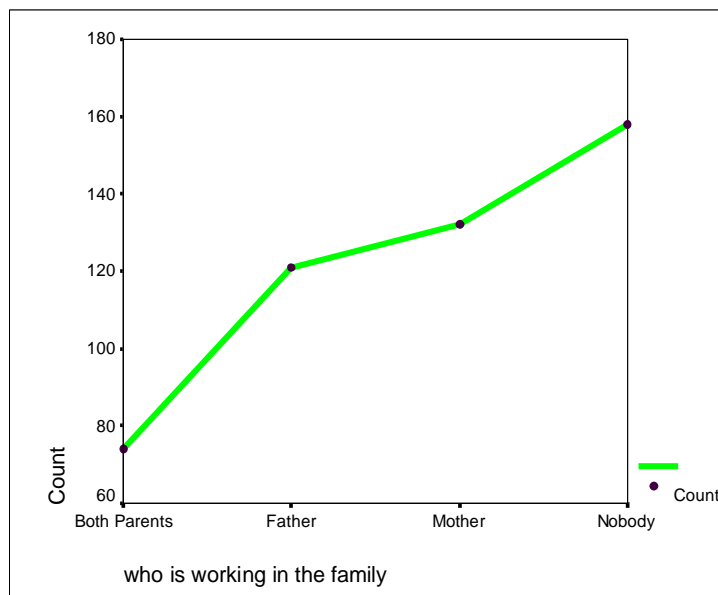


Klipgat, 6 (1%) learners reside in Slovoville, 1 learner resides in each of the following areas, Dipompong, Hammanskraal, The Orchards and Stinkwater.

### 4.3. Responses to the question “Who is working in the family?”

158 (32.6%) of parents of learners attending Tswaing High School were not employed at the time of the study. This is higher than the unemployment rate in the country as a whole, which is 25.5% but lower than Winterveldt unemployment rate, which is 40-45%. The high incidence of households where neither parent works will have a significant influence on the practices of learners as far as nutrition and diet are concerned. Parents’ levels of education and the scarcity of jobs in the country might be a cause for the high level of unemployment: only 74 (15.3%) of the learners in this study indicated that both their parents were employed. A line graph below indicates the frequency, percentage and cumulative percentage on the question “Who is working in the family?”

Figure 4: Learners’ response to ‘Who is working in the family?’



### 4.4. Person who cooks or prepares meals

87 (17.9 %) learners indicated that they prepared food for the family. This could have an impact on their practices and knowledge of nutrition and diet. There are several

reasons why they do not prepare food for the family, including their cultural or traditional practices. Wives and mothers are expected to cook for the family and their husbands. 232 (47.8 %) responded that their mothers prepared food for the family. Fathers, older brothers and male learners do not play a major role in the preparation of meals. Only 20 (4.1%) male learners indicated that they cooked for the family and only 9 (1.9%) of participants' older brothers helped in preparing food or cooking for the family. According to these responses, only 6 (1.2%) of fathers played a role in preparing meals for the family. This might be due to urbanisation: fathers and brothers only come home at the end of the month and some learners do not live with their fathers, and may not even know their fathers.

#### **4.5. Number of respondents who live near a soccer field**

Almost half of the learners in the study 218 (44.9%) resided in the vicinity of a soccer field. The significance of this variable will be explained when it is compared to the variable of physical exercise activities among learners in the study.

**Table 2: Responses of learners to “Who lives near a soccer field?”**

	Frequency	Percentage	Cumulative Percentage
Near a soccer field	218	44.9	44.9
Far from a soccer field	267	55.1	100.0
Total	485	100.0	

#### **4.6. Analysis of the eleven FBDGs**

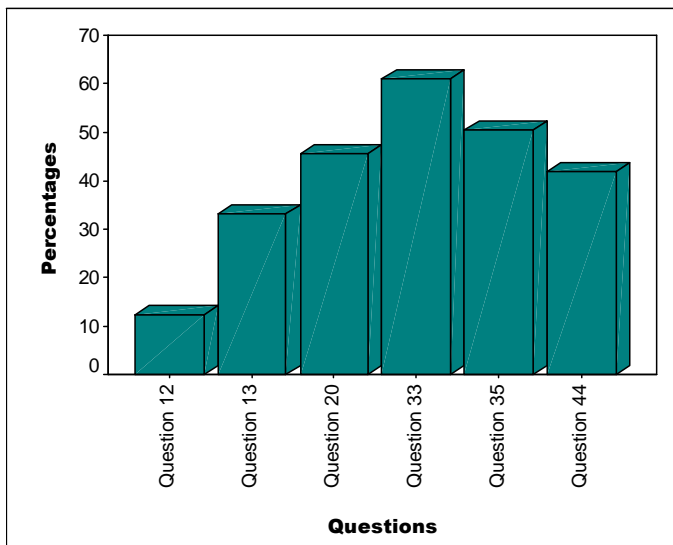
The researcher analysed the learners' knowledge of nutrition by categorising the questions into the eleven South African Food-Based Dietary Guidelines (FBDGs), as follows:

The questions were categorised according to the guidelines and learners' responses to each guideline were analysed. Bar graphs representing the responses of learners to each of the guidelines in percentages are as follows:

### 4.6.1. Guideline One: Enjoy a variety of foods

Question 33 had the highest number of responses of learners answering the question correctly under guideline one, revealing that 295 (61%) of learners at Tswaing High School know that it is healthier to enjoy a variety of foods; on the other hand, there were only a few responses of learners answering the questions correctly to Question 12 60 (12.3%). This indicates that while learners are aware that we should eat different kinds of food, question 30, they do not know that some foods should be eaten more frequently than others and that we should eat certain foods in moderation, question 12.

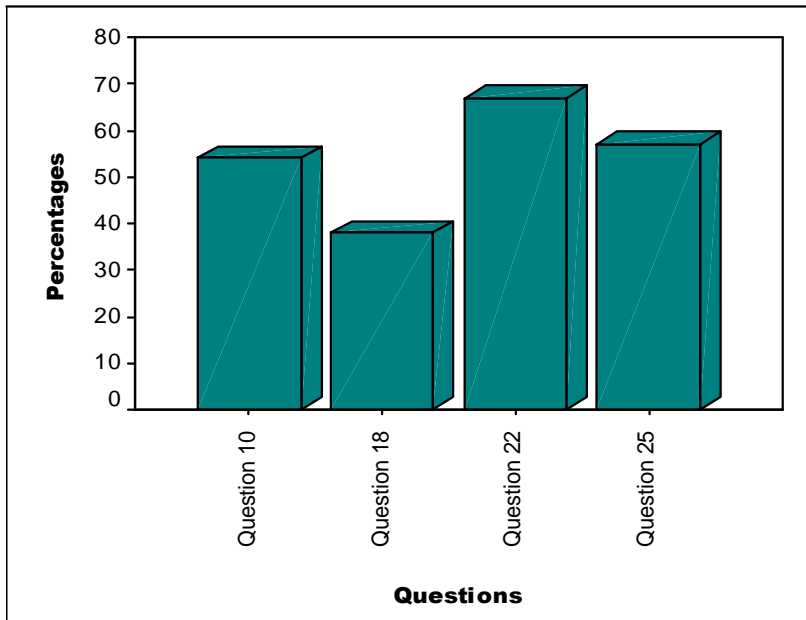
Figure 5: Responses of learners to Guideline 1



### 4.6.2. Guideline Two: Be active

Learners performed well in question 22. 325 (67%) of the learners responded correctly in question 22, which suggest that they know that in order for one to keep healthy, one should combine a healthy diet with physical activity. The lowest number responses on guideline 2 were for question 18. 184 (38%) of the learners responded correctly on this question which could mean that some learners do not know the value of physical activity or of being physically active.

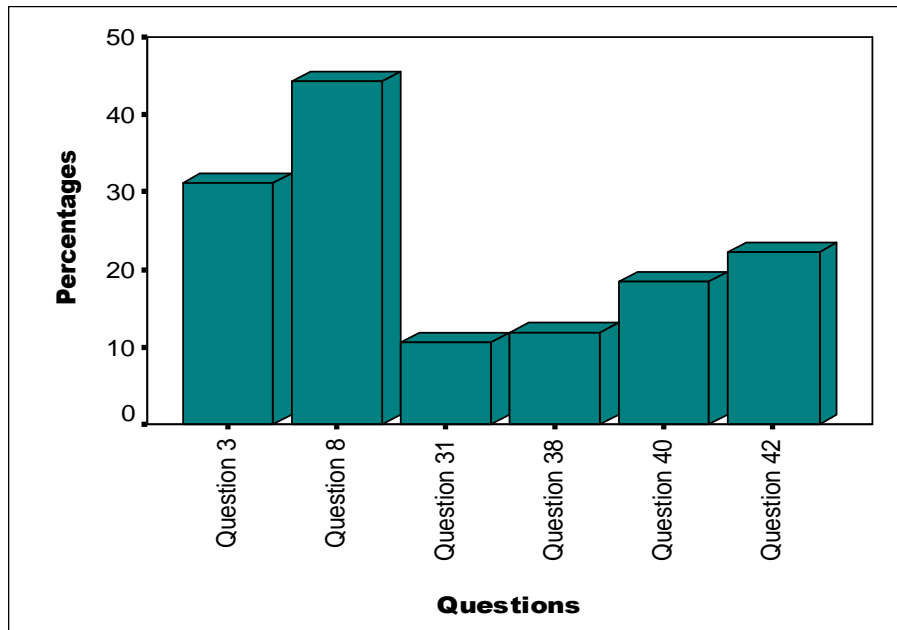
Figure 6: Responses of learners to Guideline2



#### **4.6.3 Guideline Three. Make starchy foods the basis of most meals**

In this guideline, the highest responses of learners who answered the question correctly were for question 8, 215 (44%), and the lowest responses were for question 31. 51 (10.5%). Only 215 (44%) of learners responded correctly to the question which shows that their knowledge on the food groups they must eat is poor. Learners' knowledge on the importance of making starchy foods the basis of most meals daily is poor and that had an impact on their understanding of what makes up a balanced diet. Knowledge of this guideline is fair and it will have an impact on learners' dietary practices.

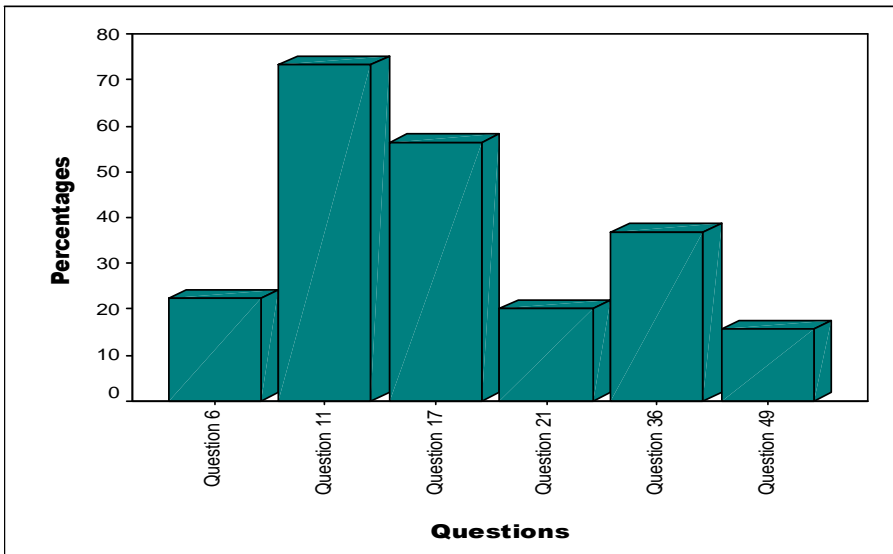
**Figure 7: Response of learners to Guideline 3**



#### **4.6.4. Guideline Four. Eat plenty of fruits and vegetables**

Question 11 has the highest number of responses of learners who got the answer correctly in this guideline, 355 (73.3%), probably because it included knowledge of hygiene. Learners know that one should wash vegetables before cooking them. This is basic hygiene and they were taught this when they did hygiene as a subject in the lower grades. But they do not know how many vegetable or fruit portions they should eat per day. Only 97 (20%) of learners responded correctly on the question (question 21) of how many vegetable and fruit portions must one eat per day. At least 76 (15.6%) of learners could answer the question 49 correctly. Most of the learners do not know that fruits and vegetables have the most Vitamin A.

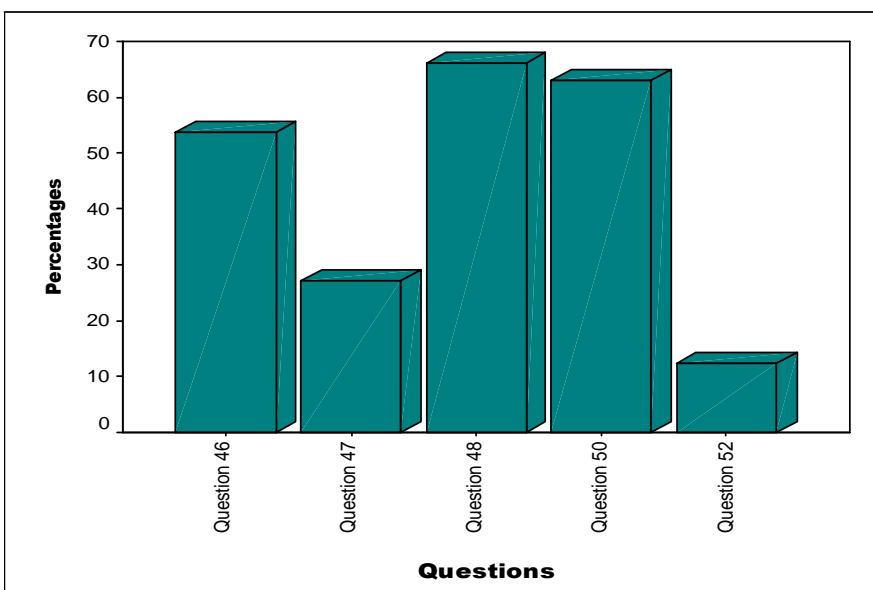
**Figure 8: Responses of learners to Guideline 4**



**4.6.5. Guideline Five. Eat dry beans, peas, lentils and soya regularly.**

321 (66.2%) of learners responded correctly to question 48. Learners know that it is not good for one to eat as much meat as they want every day. At least 60 (12.3%) of learners responded correctly to question 52. Learners do not know the reason why the legumes are good for our health. This will have an impact on their practice.

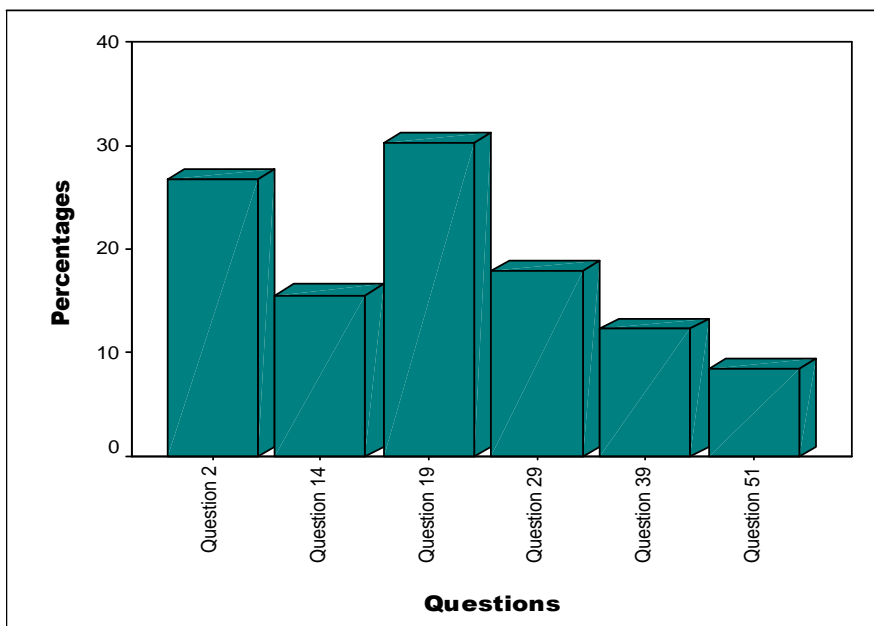
**Figure 9: Responses of learners to Guideline 5**



#### 4.6.6. Guideline Six: Meat, fish, chicken, milk and eggs may be eaten every day

In this guideline, the performance of learners on all questions is poor. Only 41 (8.5%) answered the question 51 correctly. This shows that learners have problem with storage of perishables. This will impact on their practices. Storage of meat seems to be an area of uncertainty for learners maybe is because they do not have refrigerators since the area does not have electricity. 146 (30%) learners responded correctly to question 19 which concentrated on foods that prevented certain diseases. This shows that learners at this school do not have knowledge on the food that prevents certain diseases.

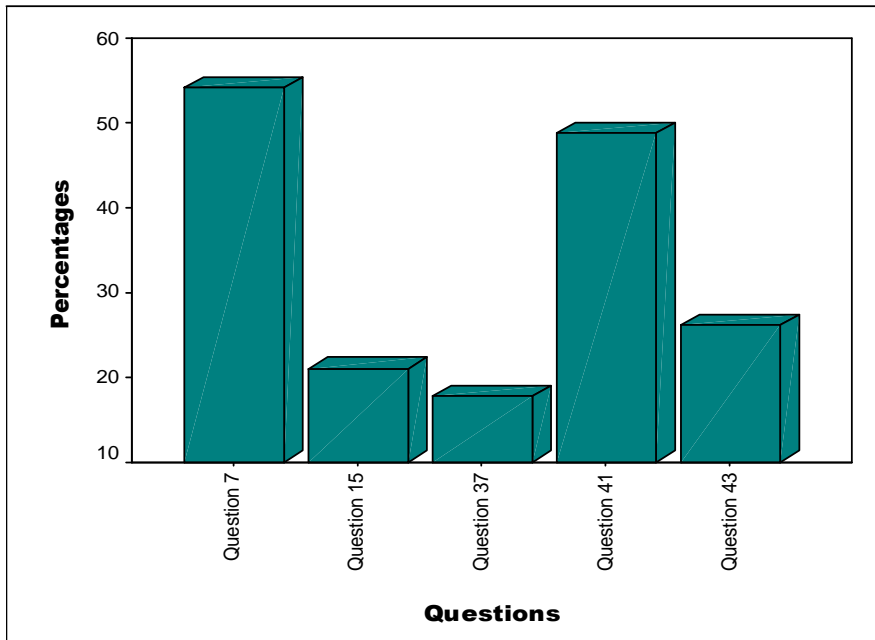
Figure 10: Responses of learners to Guideline 6



#### 4.6.7. Guideline Seven. Eat fats sparingly

Only 262 (54%) of learners responded correctly to question 7. They know of snacks that are low in fat. Learners are unaware of menus that contain little fat. 86 (17.7%) of learners answered question 37 correctly. This performance is poor and it will have an impact on their practice because they are less likely to prepare a balanced diet for the family when they do not have knowledge on menus that have little fat.

**Figure 11: Responses of learners to Guideline 7**

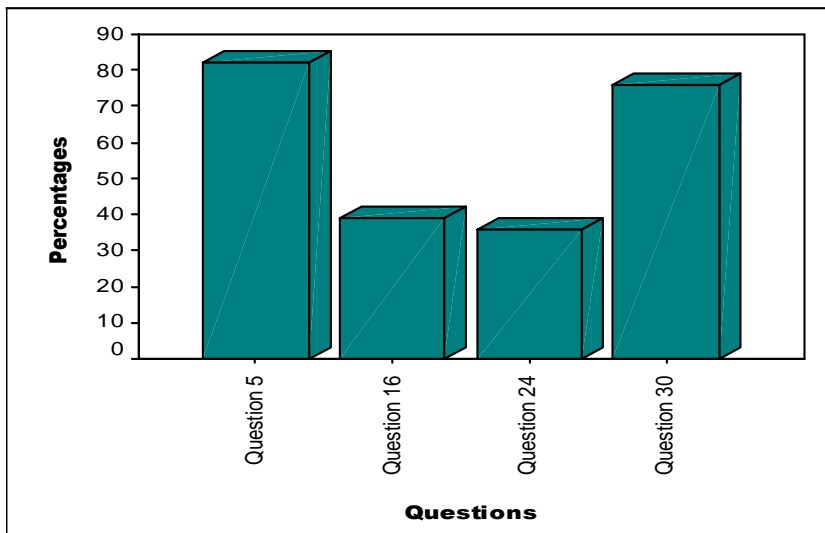


#### **4.6.8. Guideline Eight. Use salt sparingly**

Learners' responses to questions 5 and 30 are interpreted as being excellent as their responses were 398 (82.1%) and 369 (76%) respectively. Learners know that they should not add extra salt to the cooked food before they taste them and they know that their body needs a little bit of salt to be healthy. 174 (36%) of learners responded correctly to question 24. Their performance is poor. They do not know that they can add salt to their food except their fruits.



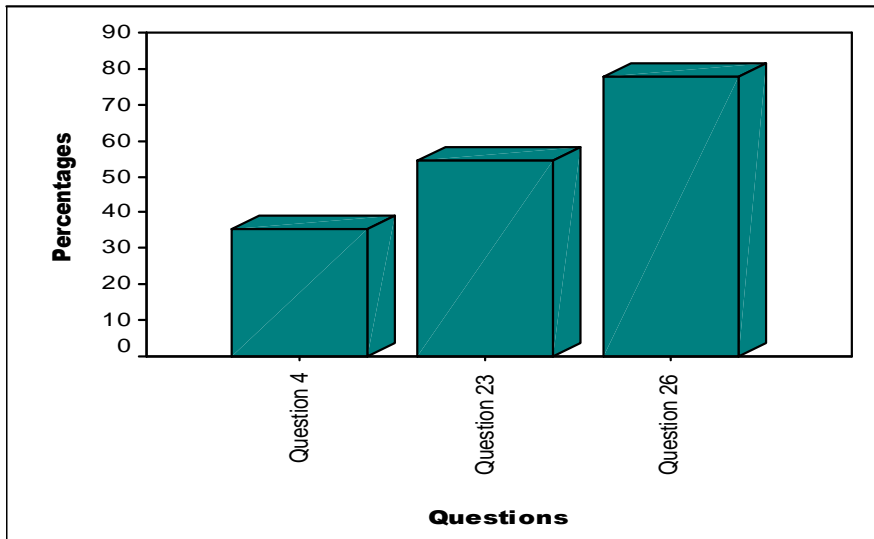
**Figure 12: Responses of learners to Guideline 8**



#### **4.6.9. Guideline Nine. Drink plenty of clean, safe water**

Most of the learners in Winterveldt know that not all water is safe to drink. 377 (77.7%) learners responded correctly to question 26. In the area there is no proper water infrastructure. Learners at this school do not know how many glasses of water they must drink a day because water is a scarce commodity in their area and they must learn to save it. Only 173 (35.6%) of learners answered the question 4 correctly. This shows that they do not drink enough water per day and this will also impact on their practices drinking water is a practice.

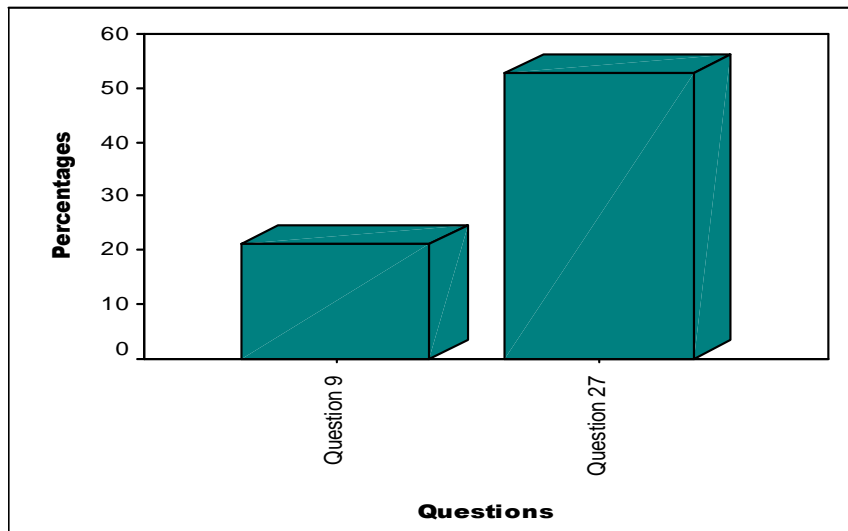
**Figure 13: Responses of learners to Guideline 9**



#### **4.6.10. Guideline Ten. If you drink alcohol, drink sensibly**

There were only two questions or variables in this category. Learners did not perform well on question 9, probably because of the myths that are prevalent in their society. They believe that they will lose weight if they drink excessively. They do, however, seem to know that one should drink alcohol sensibly even if one has eaten.

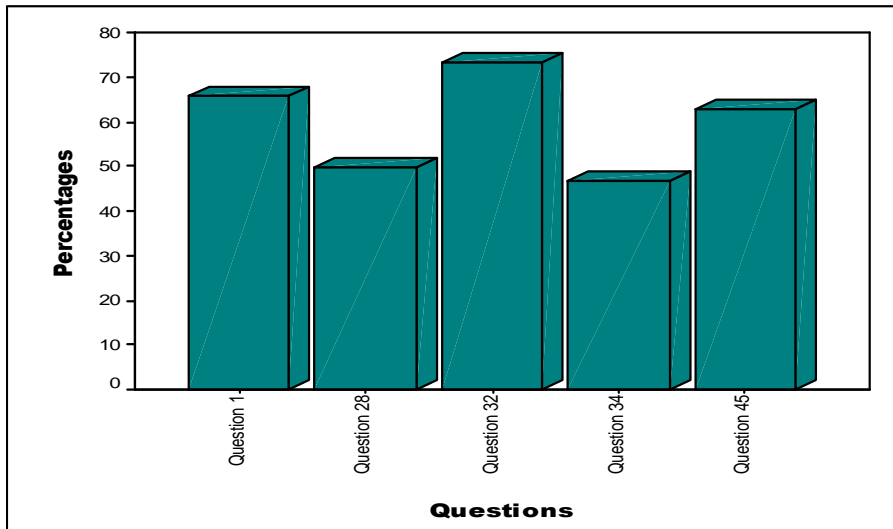
**Figure 14: Responses of learners to Guideline 10**



#### **4.6.11. Guideline Eleven. Use sugar sparingly**

Responses of learners to this guideline were above 45% which suggests that they know about sugar and its associated health risks.

**Figure 15: Responses of learners to Guideline 11**



#### **4.7. Responses to vigorous exercise**

Questions 55 and 56 focused on learners' practices as far as vigorous exercise is concerned. A third of learners 176 (34.8 %) responded that they had not participated in any vigorous exercise for the past seven days. Only 57 (26.1%) of learners who live near a soccer field participated in vigorous exercise for more than an hour on more than one day a week. Very few learners 15 (6.9%) living near a soccer field participated for more than a day in vigorous exercise that lasted for minutes while 22 (10.1%) participated but were not sure whether this had lasted for minutes or hours. This indicates that learners have a low participation rate in vigorous exercise even if they live near sporting facilities.

On the other hand, 57 (21.3%) of learners who did not live near to a soccer field participated in vigorous exercise for hours on more than one day a week. 20 (7.5%) participated in vigorous exercise that lasted for minutes while 21 (7.9%) of learners were not sure for how long they had exercised.

#### **4.8. Responses to moderate exercise**

Learners were asked to indicate what moderate exercise they had participated in over the past seven days. Very few of the learners, 35 (16.1%), living near a soccer field participated in moderate exercise for more than an hour, 24 (11%) participated for minutes and 40 (18.3%) of learners were not sure how long their exercise sessions had lasted.

Learners who were not close to sporting facilities tended to participate more in moderate physical activity than those living near a soccer field. Learners living in Winterveldt and its surrounds fetch water using wheelbarrows. This may explain why those far from sports fields may participate in moderate exercise.

#### **4.9. Responses to questions on sedentary periods**

On the question of time spent sedentary, 90 (41.3%) of learners living near a soccer field responded that they sat for hours, 33 (15.1%) learners responded that they sat for minutes while 42 (19.3%) were not sure about the time spent seated.

Responses of learners not living close to a soccer field were higher than those who did live near one. At most 123 (46%) learners responded that they sat for hours, 34 (13%) of learners were sedentary for minutes at a time while 63 (24%) of learners were not sure how long they spent seated.

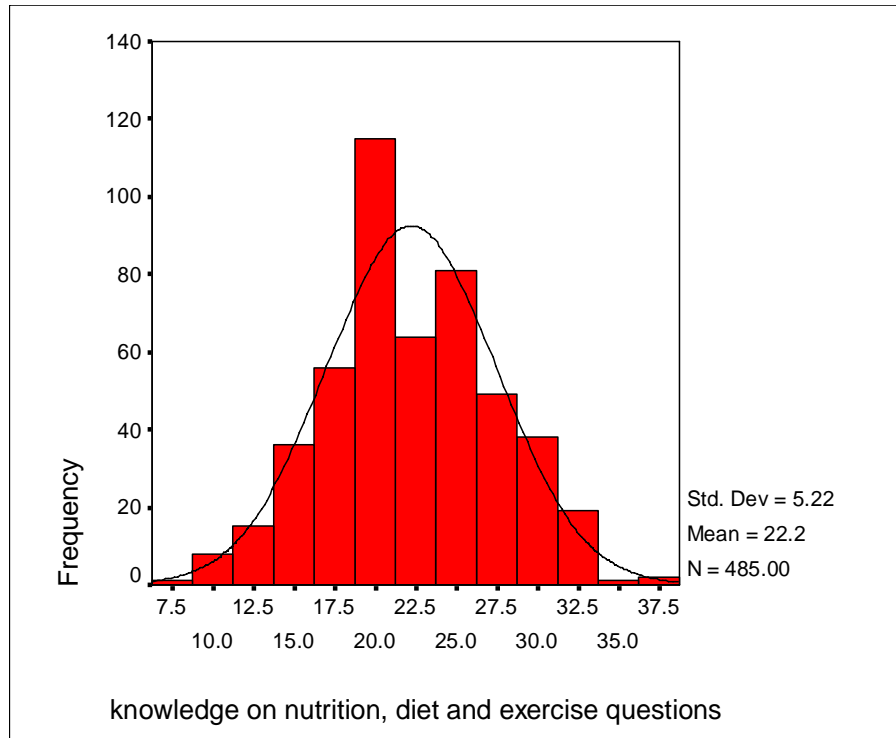
#### **4.10. Responses to questions about nutrition and exercise and their rating scale**

Almost a quarter of grade 10 learners (24%), (25%) of grade 11 learners and (32%) of grade 12 learners responded that schools provide reliable information about nutrition and exercise. The other variables such as radio, television, magazines, parents and peers did not appear to have any significant influence on respondents. The responses to these variables were below 1%: for instance, 0.05% of grade 10 learners, 0.1% of grade 11 learners and 0.05% of grade 12 learners responded that schools provided

unreliable information about nutrition and exercise.

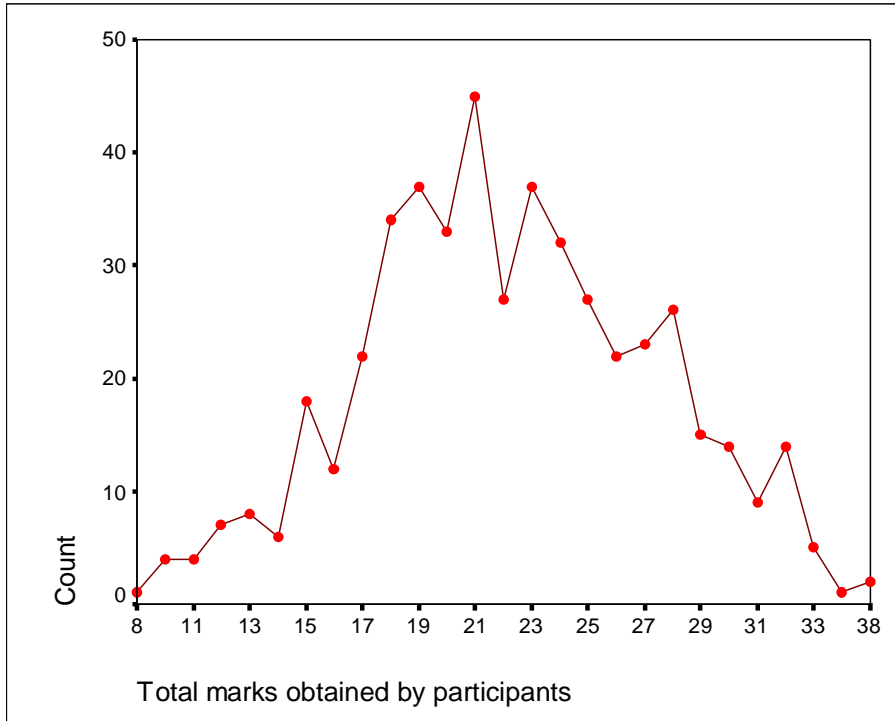
#### 4.11. Norm-referenced performance-rating scale for the nutrition knowledge questionnaire

Figure 16: Graphical representation of scores obtained by individual learners on the nutrition, diet and physical activity questionnaire



The lowest mark obtained by learners from the questionnaire given to them was 8 and the highest mark is 38. A female grade 11 learner obtained the lowest mark and two grade 12 learners (a male and a female) obtained the highest mark. The mark of 21 has the highest frequency of 45, which means 9.3% of learners obtained 21 marks. Therefore the range is 30. The median of the scores is 22, the mode is 21 and the mean is 22.2. The difference amongst the three central tendencies is very small and there is a normal distribution curve. See table 4.8 below:

**Figure 17: Marks obtained by individual learners on the nutrition, diet and physical activity questionnaire**



**Table 3: Cross Tabulation of marks obtained and age**

Marks obtained	AGE	AGE	AGE	AGE	Total
	15	16	17	18	
8	0	1	0	0	1
10	0	1	1	2	4
11	0	1	0	3	4
12	0	1	2	4	7
13	1	1	3	3	8
14	0	1	1	4	6
15	1	5	2	10	18
16	0	2	3	7	12
17	0	8	3	11	22
18	1	6	10	17	34
19	2	4	5	26	37
20	1	6	7	19	33
21	2	6	13	24	45
22	3	7	3	14	27
23	5	5	11	16	37
24	3	8	7	14	32
25	0	5	3	19	27
26	0	4	5	13	22
27	1	4	3	15	23
28	2	2	7	15	26
29	0	2	4	9	15
30	0	2	4	8	14
31	0	3	0	6	9
32	0	2	3	9	14
33	2	1	0	2	5
35	0	0	1	0	1
38	0	0	0	2	2
Total	24	88	101	272	485

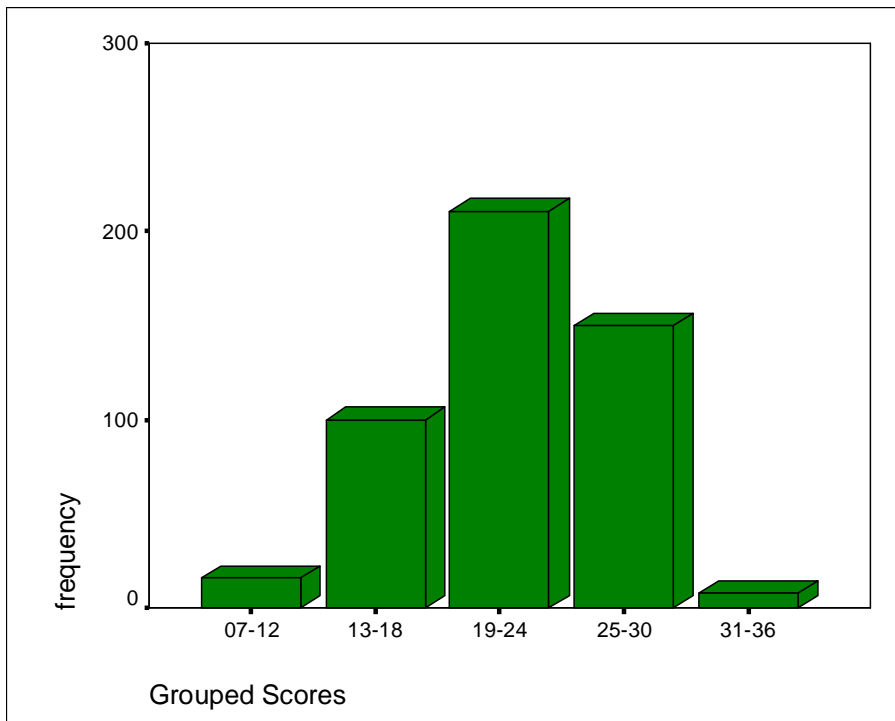
Seventy-seven percent of learners achieved scores below or equal to 50%. This suggests that learners do not have correct information on nutrition, diet and physical activity. Only 23% of learners revealed a satisfactory knowledge. According to the norm-referenced performance-rating scale developed by Whati, Senekal, and Steyn (2005), 82 (17%) of learners were classified as being poor and 294 (61%) as being

below average on the nutrition, diet and physical activity knowledge scale. Only 65 (13%) of learners could be classified as being good and at least 44 (9%) learners are above average. The table below illustrates the performance of learners on the nutrition questions. It should be noted that the size of the class interval is not the same because it is based on the norm-referenced performance-rating scale for the nutrition knowledge questionnaire that was designed by Whati, Senekal and Steyn (2006).

**Table 4: The performance of learners on the nutrition, diet and physical activity questions**

Scores	Frequency	%
08-17 (very poor)	82	17
18-26 ( below average)	294	61
27-29 (good)	65	13
30-38 (very good)	44	09

**Figure 18: Grouped test scores of learners at Tswaing High School**





## **CHAPTER5.- DISCUSSION,CONCLUSION AND RECOMMENDATIONS**

The research question of this study was “Are learners well informed on the importance of a healthy diet, good nutrition and physical exercise?” From the results of the analysis of the data the answer would seem to be “No”. The fact that learners are not adequately informed could account for why 376 (77.5%) of them achieved scores of below 50%. This indicates that there is a real need for intervention programmes. Learners need to be taught the importance of nutrition, diet and physical activity at school level and to be shown how these factors can affect their health in adult life. They should also be made aware that unhealthy lifestyle diseases are often incurable.

The second question was, “Do learners act on their knowledge?” Our learners do not have adequate knowledge on nutrition, diet and physical exercise which is why only 18% of our learners prepare food at home which is a very small percentage. This shows that our learners do not know the different kinds of nutritious menus. They even performed poorly on question37 where they had to choose a menu that has low/little fat. Only 17.7% of the learners could answer that question correctly. Our learners know that it is not good for one to eat as much meat as they want and only 12.3% of learners know the importance of legumes. This shows that they do not eat enough protein daily.

In the knowledge section, Guideline 02, only 38% of learners responded correctly to the question of what physical activity means to them while 62% did not understand the term physical activity. This confirms that learners do not have adequate knowledge about the importance of physical activity and this will affect their responses to the practice of physical activity. About 38% of learners could not keep track of the time they spent on vigorous or moderate physical or sedentary activities. Learners living near a soccer field do not always seem to engage regularly in any physical activities.

According to Walsh, Dannhauser and Joubert (2003), inadequate food intake and

unhygienic dietary practices are often related to poor knowledge and practices. This seems to be the case of learners at Tswaing High School, since they performed poorly on guidelines 03, 05 and 06. These pose a problem as far as knowledge and practise of a healthy diet and nutrition are concerned. If learners are unaware that they should make starchy food the basis of most meals, and that they should eat dry beans, peas, lentils and soya regularly and meat, fish chicken, milk and eggs daily, they are clearly in need of health promotion intervention.

Health promotion strategies should be implemented at school level in order to correct learners' current inadequate information. Such faulty information could potentially increase the rate of morbidity and mortality of non-communicable diseases. After training low-income communities in the Free State and Northern Provinces over a period of two years, knowledge of what to eat daily to remain healthy improved significantly by between 42.2% and 52.6% in rural intervention areas (Walsh et al., 2003).

The results of this study do not differ much from those of other research studies even though those studies did not concentrate on adolescents. This study supports the belief that there is a need for intervention at school level. According to the Department of Education of South Africa, it is important that learners have knowledge of healthy practices which will in turn improve their well-being and reduce the incidence of lifestyle diseases in the country.

Rapid and unplanned urbanization accelerates changes in traditional diets and physical activity, and provides ready access to tobacco products and high-fat foods, all risk factors for non-communicable diseases. Migrants often settle in informal settlements on the periphery of cities. These living conditions have consequences for the preparation, consumption and hygiene of food among urban blacks (Kruger et al., 2005). Learners of Tswaing High School performed very badly on the question of storing meat, fish and chicken. Only 9% of the learners answered the questions correctly. This poor performance might stem from the fact that they live in an informal settlement and that their households do not have refrigerators.

From the results obtained in this study, learners do not appear to have an adequate

knowledge of nutrition, diet and physical activity and their practices are questionable. Efficient and effective policies must be implemented in order to govern health promotion programmes at school level. If these policies are implemented at school level, schools will be forced to have open days where they will inform learners about the importance of nutrition and physical activity. Schools will invite experts on nutrition and physical activities to give a talk on health issues and in so doing learners will then know more about nutrition and physical activities. Schools will also be expected to put placards on the wall that will inform learners on the importance of nutrition and physical activity.

The researcher recommends that government departments join hands to build recreational facilities in rural and semi-rural areas to encourage learners to understand the importance of physical activities.

Life-Orientation teachers should be trained to teach the importance of nutrition, diet and exercise to learners. For instance, when teachers attended a one-day training session on Life-Orientation but nothing was said about nutrition. During the year these teachers received notices to teach these two aspects but were not given any training to do so. Nutrition and physical education must be taken seriously.

Owners of tuck shops and street vendors should be taught the importance of a healthy diet and how they can replace the present high fat and sugar content of processed foods with more nutritious substitutes.

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## **APPENDICES**

### **Appendix 1 - Consent form**

Research topic

Diet, nutrition and exercise knowledge and practices of learners attending Tswaing High School, Winterveldt.

REPC number

NSPH/ST2006/15.

#### 1. Introduction

You are invited to take part in a research study. Before you decide to be part of this study, you need to understand the risks and benefits. This consent form provides information about the research study. I will be available to answer your questions and provide further explanations. If you agree to take part in the research study, you will be asked to sign this consent form. This process is known as informed consent. Your decision to take part in the study is voluntary. You are free to choose whether or not you will take part in the study.

#### 2. Purpose

As a student in the National School of Public Health of the University of Limpopo (Medunsa Campus), I am carrying out a research study to find out the views and perceptions of high school learners in the Winterveldt area on diet, nutrition and exercise.

#### 3. Procedures

The research will be conducted at your school. You need to come to school during the study. You will participate only once in the study. The total time required to participate in the study is ± 45 minutes.

#### 4. Possible Risks

The things you will be doing have no more risk of harm than your everyday experiences.

#### 5. Possible benefits

You will not receive any personal benefits from taking part.

#### 6. Costs

Taking part in this study will not cost you anything.

#### 7. Compensation

You will not receive compensation for participating in this study.

#### 8. Right to withdraw from the study

Your participation in this research study is voluntary. You may decide not to begin or to stop this study at any time.

#### 9. Privacy of research records

Your records will be private. No one except the research team will know that you are a part of this study. The individuals acting on behalf of the university may review your information. If that happens, we will give them copies of your records that are only related to the study. These copies will not have any information that can link you to the study. Except for these groups, your records will be kept private unless you permit their release or if the records are asked for by court order. Your records will be used for research purposes only. At the end of the study, the records will be destroyed.

10. Questions

If you have questions about this study, please call 083 644 6449 during the daytime.

11. Signature

By signing this consent form, you agree that you have read this informed consent form, you understand what is involved, and you consent to take part in this study. You do not give up any of your legal rights by signing this informed consent form. You will receive a copy of this consent form.

---

Participant(PrintName)

---

Signature

Date

				2	0	0	6
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12. Researcher statement

I certify that the research study has been explained to the above individual including the purpose, the procedures, the possible risks and the potential benefits associated with participation in this research study. Any questions raised were answered to the individual's satisfaction.

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**Investigator**

---

**Signature**

**Date**

				2	0	0	6
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## Appendix 2 - Questionnaire.

### Cover page

My name is Segametsi Letlape and I am a Master of Public Health student at the University of Limpopo (Medunsa Campus). This is a questionnaire and not a test. It is part of my research project to evaluate the knowledge and practices of diet, nutrition and exercise among high school learners.

Your contribution is of great importance and the information will be treated in strict confidence. Please answer all questions: it is important that you give honest answers without getting help from anybody. Participation is voluntary and you are free to withdraw from the study.

You do not have to fill in your name and your answers will be confidential. The results of the questionnaire will be collectively reported.

The questionnaire consists of two types of questions, namely,

#### 1. Multiple choice

You need to choose **one** answer that you think is correct and tick the number that is next to the answer.

#### 2. True or False

You will choose whether a statement is true or false and tick in the space provided.

The questions refer to a healthy person who is not on any medication or special diet.

For example:

Question : The last meal I had was last night

1	True	
2	False	X

Please answer each question before moving on to the next one.

			YY	MM	DD
--	--	--	----	----	----

DATE

SUBJECT NUMBER

--	--	--	--

SECTION:A.BIOGRAPHICAL INFORMATION

A. How old are you?

1.	14 years old	
2.	15 years old	
3.	16 years old	
4.	17 years old	
5.	18 years old	

B. What is your gender?

1.	Male	
2.	Female	

C. In what grade are you?

1.	Grade 10	
2.	Grade 11	
3.	Grade 12	

D. Who is working in your family?

1.	Mother	
2.	Father	
3.	Both Parents	
4.	Nobody is working	

E. Where do you live?

1.	Winterveldt	
2.	Soshanguve	
3.	Mabopane	
4.	Slovoville	
5.	Klipgat	
6.	Eesterus	
7.	Other: name below	

F. Who cooks/prepares food at home?

1.	Mother	
2.	Father	
3.	Older brother	
4.	Older sister	
5.	You	
6.	Other: name below	

G. Do you live near a soccer field?

1.	Yes	
2.	No	





The next questions ask about your food intake practices

1. You should eat a lot of sugar to have enough energy.

1.	True	
2.	False	

2. Cooked meat/fish/ chicken sold on the street may not always be safe to eat because...

1.	It may have been undercooked.	
2.	The cook may not have used fresh meat.	
3.	It may have been kept for a long time before being cooked.	
4.	All of the above.	

3. You should not have starch at most meals because

1.	It is not important for your health.	
2.	Even eating small amounts can cause weight gain.	
3.	Starch causes disease.	
4.	None of the above.	

4. How much water should you drink a day?

1.	You do not have to drink water every day.	
2.	1 to 3 glasses.	
3.	4 to 6 glasses.	
4.	7 to 9 glasses.	

5. You should add extra salt to your cooked food before you even taste it.

1.	True	
2.	False	

6. How much is a *portion* of cooked vegetables?

1.	1 tablespoon	
2.	Half a cup	
3.	1 cup	
4.	2 cups	

7. Which of the following is a low food snack?

1.	“Simba” Chips	
2.	Popcorn	
3.	Fried chips	
4.	“Niknaks”	

8. From which group should you eat most food each day?

1.	Bread, rice, samp, porridge	
2.	Apples, bananas, spinach, carrots	
3.	Milk, yoghurt, cheese	
4.	Chicken, fish, beans, eggs	

9. Drinking a lot of wine, beer or cider can cause weight gain.

1.	True	
----	------	--

2.	False	
----	-------	--

10. People who are overweight should not be physically active.

1.	True	
2.	False	

11. It is usually unnecessary to wash vegetables before you cook them.

1.	True	
2.	False	

12. The key to a healthy way of eating is to

1.	Eat many different kinds of foods.	
2.	Eat some foods more often than others.	
3.	Eat certain kinds of foods in moderate or small amounts.	
4.	All of the above.	

13. The following foods must not be eaten at all when one is trying to lose weight:

1.	Bread and rice	
2.	Meat and fish	
3.	Margarine	
4.	None of the above	

14. Which foods contain a lot of calcium?

1.	Chicken and eggs	
2.	Milk and yoghurt	
3.	Pilchards	
4.	2 and 3 above	

15. The healthiest snack is:

1.	A glass of milkshake	
2.	A tub of unbuttered popcorn	
3.	A slab of chocolate	
4.	2 and 3 above	

16. To which of the following foods has iodine been added?

1.	Bread	
2.	Maize meal	
3.	Table salt	
4.	Powdered milk	

17. If you were trying to increase the amount of fibre in your diet, which of the following foods would you eat more of?

1.	Cakes and biscuits	
2.	Apples and carrots	
3.	Chips and pies	
4.	Chicken and fresh fish	

18. Being physically active means

1.	Going to the gym.	
2.	Walking a lot.	
3.	Playing sports like soccer and netball.	
4.	All of the above.	

19. Which of the following choices of foods prevent certain diseases?

1.	Fish, chicken without skin, and lean meat	
2.	Beef sausage, bacon, and lean meat	
3.	Fried fish, fried chicken, and regular mince	
4.	All of the above	

20. Which foods contain a lot of fibre?

1.	Oats, apples, beans	
2.	Milk, yoghurt, cheese	
3.	Beef, chicken, mutton	
4.	Butter, margarine	

21. How many fruits and vegetables should be eaten a day?

1.	1 fruit and vegetable a day	
2.	3-4 fruits and vegetables a day	
3.	5 or more fruits and vegetables every day	
4.	There is no need to eat fruit and vegetables daily	

22. If you are eating a healthy diet there is no need for you to be physically active.

1.	True	
2.	False	

23. Drinking boiled water is a good way to lose weight.

1.	True	
2.	False	

24. Salt should be added to all foods except fruit.

1.	True	
2.	False	

25. If one wants to lose weight there is no need to be physically active; it is better simply to diet.

1.	True	
2.	False	

26. All water is safe to drink.

1.	True	
2.	False	

27. You can drink as much wine, beer or cider as you want provided you have eaten first.

1.	True	
2.	False	

28. A little sugar can be eaten when one is trying to lose weight.

1.	True	
2.	False	

29. How much milk or maas should you have a day?

1.	None	
2.	Half a cup	
3.	One cup	
4.	Two cups	

30. Your body needs a little bit of salt to be healthy.

1.	True	
2.	False	

31. A well-balanced diet

1.	Consists mostly of meat, with smaller amounts of starch, fruits, vegetables, and dairy products.	
2.	Consists mostly of vegetables, and smaller amounts of meat and dairy products.	
3.	Consists mostly of starches, vegetables and fruits, with smaller amounts of meat and dairy products.	
4.	None of the above.	



32. Sugar and foods that contain sugar should be eaten in small amounts.

1.	True	
2.	False	

33. Eating a lot of different foods is healthier than eating only a few types foods.

1.	True	
2.	False	

34. Sugar contains a lot of vitamins and minerals.

1.	True	
2.	False	

35. It is impossible to get all the vitamins and minerals you need from food. You need to take a vitamin and mineral supplement.

1.	True	
2.	False	

36. Which of the following groups of nutrients are found in large amounts in fruits and vegetables?

1.	Fibre, Vitamin A	
2.	Starches, fat, Vitamin D	
3.	Fats, Iron, Calcium	

4	None of the above	
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37. Which of the following breakfast menus contains little fat?

1.	Whole-wheat toast with thinly spread margarine	
2.	Weet-Bix with 2% fat milk	
3.	Bacon and egg	
4	1 and 2	

38. Which food has the most fibre?

1.	White rolls	
2.	Brown bread	
3.	White bread	
4	Whole-wheat bread	

39. The best way to defrost meat from a frozen state is to

1.	Leave it at room temperature.	
2.	Leave it in the fridge.	
3.	Leave it in sunlight.	
4	Meat should never be defrosted.	

40. Starchy foods should not be eaten when one is trying to lose weight.

1	True	
2	False	

41. To make sure that you stay healthy you should eat

1.	Lean meat, fruit and vegetables, low fat dairy products, and breads and cereals.	
2.	Fruit and vegetables only.	
3.	Bread, cereals, fruit and vegetables only.	
4.	Low fat dairy products and lean meat only.	

42. Eating bread always causes weight gain.

1.	True	
2.	False	

43. Which of the following foods are the lowest in fat?

1.	Corn flakes and full cream milk	
2.	Grilled lean steak and boiled carrots	
3.	Pizza and milkshake	
4.	Fried lamb chops and creamed spinach	

44. To protect yourself from disease you should avoid eating many different kinds of foods.

1.	True	
2.	False	

45. It is healthy to snack on foods that contain a lot of sugar.

1.	True	
2.	False	

46. Dry beans, peas and lentils should be eaten regularly.

1.	True	
2.	False	

47. Soya mince is as healthy as meat.

1.	True	
2.	False	

48. You can eat as much meat as you like every day.

1.	True	
2.	False	

49. Which group of foods has the most Vitamin A?

1.	Oats, whole-wheat bread, rice	
2.	Carrots, spinach, sweet potatoes	
3.	Pies, cakes, puddings	
4.	None	

50. Dry beans, peas and lentils are a healthy choice to eat instead of meat.

1.	True	
2.	False	

51. Meat/fish/chicken will not spoil if you store them

1.	In the cupboard for a few days.	
2.	In the fridge for 2 days.	
3.	In the freezer for 3-4 months.	
4.	All of the above.	

52. The reason beans, peas and lentils are good for you is that

1.	They contain small amounts of fats.	
2.	They contain a lot of fibre.	
3.	They can protect you from some diseases.	
4.	All of the above.	

SELECT *YES* OR *NO* FOR ALL THE CHOICES

53. From where do you get your information about nutrition and exercise?

		Yes	No
1.	School		
2.	Peers/Friends		
3.	Parents		
4.	Radio/TV/Magazines		
5.	Other (Specify)		

54. Of the choices you have selected above, how would you rate them as source of information? **Tick where applicable**

1 = Very unreliable

2 = Unreliable

3 = Reliable

4 = Very reliable

		Very unreliable	Unreliable	Reliable	Very reliable
1.	School	1	2	3	4
2.	Peers/Friends	1	2	3	4
3.	Parents	1	2	3	4
4.	Radio/TV/Magazines	1	2	3	4
5	Other (Specify)				
		1	2	3	4
		1	2	3	4

The next questions ask about your physical exercise activities

The questions will ask you about the time you spent being physically active in the last seven days. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at school, as part of your home and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

### **Vigorous activity**

Think about all the vigorous activities you took part in over the last seven days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

**NB.** *If you took part in no vigorous physical activity, please skip to Question 65.*

55. During the last seven days, on how many days did you take part in vigorous physical activities such as heavy lifting, digging, aerobics, or fast cycling?

a. Days per week

56. How much time did you spend doing vigorous physical activities on each of these days?

a. Hours per day

b. Minutes per day

c. Don't know, or not sure

### **Moderate activity**

Think about all the moderate activities that you took part in over the last seven days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than usual. Think only about those physical activities that you took part in for at least 10 minutes at a time.

*NB. If you took part in no moderate physical activity, please skip to **Question 67**.*

57. During the last seven days, on how many days did you take part in moderate physical activities such as carrying light loads, cycling at a regular pace, or doubles tennis? Do not include walking.

a. Days per week

58. How much time did you usually spend doing moderate physical activities on one of those days?

- a. Hours per day
- b. Minutes per day
- c. Don't know, or not sure

### **Walking**

Think about the time you spent walking in the last seven days. This includes at work and at home, walking from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

*NB. If you did no walking, please skip to **Question 69**.*

59. During the last seven days, on how many days did you walk for at least 10 minutes at a time?

Days per week

60. How much time did you usually spend walking on one of those days?

- a. Hours per day
- b. Minutes per day
- c. Don't know, or not sure

### **Sitting**

The last question is about the time you spent sitting on weekdays during the last seven days. Include time spent at work, at home, while doing course work and during leisure



time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

61. During the last seven days, how much time did you spend sitting on a week day?

- a. Hours per day
- b. Minutes per day
- c. Don't know, or not sure

THANK YOU FOR PARTICIPATING IN THIS STUDY