

**GUIDANCE IMPLICATIONS RELATED
TO THE EATING HABITS OF
ADOLESCENTS**

by

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I declare that: "Guidance Implications related to the Eating Habits of Adolescents is my own work and that all the resources that I have used or quoted have been indicated and acknowledged by means of complete references".

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Dedicated to:

*My parents
Johannes and Heather de Beer
for their love
and
for encouraging me
to be the very best I can be.*

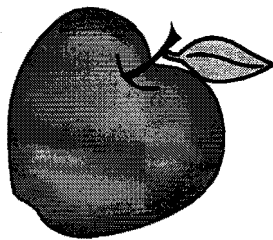
ON BEING YOURSELF

*You must learn that you cannot be loved by all people.
You can be the finest apple in the world – ripe, juicy,
sweet, succulent – and offer yourself to all.
But you must remember that there will be people who do
not like apples.*

*You must understand that if you are the world's finest
apple, and someone you love does not like apples,
you have the choice of becoming a banana.
But you must be warned that if you choose to become a
banana, you will be a second-rate banana.
But you can always be the finest apple.*

*You must also realize that if you choose to be a second-rate
banana, there will be people who do not like bananas.
Furthermore, you can spend your life trying to become the
best banana – which is impossible if you are an
apple – or, you can seek again to be the finest apple.*

(Unknown)



GUIDANCE IMPLICATIONS RELATED TO THE EATING HABITS OF ADOLESCENTS

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Summary

Due to the fact that many adolescents do not follow a balanced diet, an investigation into the eating habits of adolescents was undertaken. Much research has been done on eating disorders but little research has been done on the concomitants and possible precursors to unhealthy eating habits among adolescents.

A literature study was done to clarify which factors cause unhealthy eating habits. The developmental aspects of adolescence and the reciprocal effect on eating habits was also investigated.

A valid and reliable measuring instrument was developed in order to measure eating habits of adolescents. This instrument was used in an empirical investigation including 340 respondents with the aim of determining the most important factors, which relate to the eating behaviour of adolescents.

Educational implications of the findings are discussed in order to provide curriculum developers, teachers, parents, counsellors and the media with guidelines to help children to adopt healthy eating habits.

KEY WORDS:

Eating habits, adolescents, nutrition, anorexia, bulimia, obesity, development, self-concept, gender, media.

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CHAPTER 1

ANALYSIS AND STATEMENT OF THE PROBLEM, AIM AND PROGRAMME OF RESEARCH

1.1 ANALYSIS OF THE PROBLEM

It has come to the author's attention in her capacity as a teacher of Biology and Life Skills, and head of hostel at a South African school, that many adolescents do not seem to be equipped to deal with the physical, physiological and psychological changes that occur during puberty. They tend to be overweight, do not participate in sport and indulge in the eating of excessive amounts of junk food, which can point to an inadequate knowledge of correct nutrition.

Many adolescents seem unconcerned about their unhealthy eating habits. For example, most hostel pupils do not eat the nutritionally balanced meals provided because they prefer the chips, chocolates and fizzy cool-drinks they can buy from the vending machines.

Very few adolescents appear to appreciate the health risks of unhealthy eating. They do not seem to understand the importance of developing healthy eating habits to meet heightened nutritional needs during this crucial stage of physical and physiological development. In addition, they do not seem to understand that unhealthy eating patterns formed during adolescence could lead to health problems later on in life.

Recent studies of eating behaviour strongly suggest that a significant number of adolescents develop unhealthy eating behaviour. The observations outlined above are in agreement with those of Moreno and Thellen (1995:171) and Gleick (1999:50) who suggest that

- a large number of adolescents are overweight and do not participate in sport
- a large number of adolescents are underweight and diet in order to maintain a slim figure. Many underweight adolescents tend to over-exercise to work off calories rather than to stay fit.
- a large number of adolescents skip breakfast as a strategy for weight control
- a large number of adolescents have developed eating disorders such as obesity, anorexia or bulimia
- a large number of adolescents eat junk foods and do not follow a healthy diet.

Much research has been done on eating disorders in general (Garner et al 1985:581, Johnson et al 1987:668, Humphrey 1989:206, Rhodes and Kroger 1992:249, Anderson in Ferrairi et al 1993:95, Frank 1996:55, Canals 1996:442 and Hartley 1998:133). However, very little research has been conducted on the eating habits of adolescents in particular and, of this research, a negligible amount concerns factors relating to unhealthy eating habits. Very few articles could be found that have been published on the eating habits of adolescents during the last five years (1995-2000). Of these articles a limited number refer to factors that could influence the eating habits of adolescents (Claude-Pierre 1998:78, Snodgrass 1997:233, Jablow 1992:99, Jacobson 1997:75, Goldberg 1996:1555, Gerdes 1981:67, Nichter 1994:109, Monroe 1996:15).

Many theories of educational psychology point to the fact that the eating behaviour of adolescents is influenced by both exogenous and endogenous factors. Exogenous factors such as parents, peers, the media and knowledge of nutrition were found to be some of the factors that influence the eating behaviour of adolescents. Among the endogenous factors influencing their eating behaviour were gender, intellectual ability, self-concept, personality and

emotions. Few empirical studies exist on the influence of these factors on the eating habits of adolescents. Information could be found on only six empirical investigations conducted during the past five years (Cusatis 1995:27-34, Keel et al 1996:203-217, Brook 1997:283-287, Chapman et al 1997:437-441, Hoare 1998:425-431, and Shaw 1998:851-861).

These empirical investigations reveal that the following factors influence the eating habits of adolescents:

- The self-concept. It was found that many adolescents between the ages of 14 and 18 have a negative self-concept with regard to their body image and, therefore, develop unhealthy eating habits (Brook 1997:284). These findings were confirmed by Hoare (1998:425), who found that a low self-concept with regard to bodily appearance could result in unhealthy eating behaviour. No empirical investigations could be found on the self-concept with regard to the personal self, the family self, the social self, the moral-ethical self and self-criticism.
- Gender. Keel et al (1996:213) found that girls tend to have more unhealthy eating habits than boys. The investigation also revealed that girls tend to spend more time dieting than boys.
- Knowledge of nutrition. Brook et al (1997:284) as well as Chapman et al (1997:440) found that adolescents have insufficient knowledge of food composition and healthy nutrition. No investigations could be found regarding knowledge of the health risks of obesity and the dangers of excessive dieting.
- Intelligence. Canals (1996:448) suggests that adolescents with low intelligence are at risk of developing unhealthy eating behaviour, while Sanders (1995:11) suggests that adolescents with high intelligence are at risk

of developing unhealthy eating behaviour. Therefore, there appears to be some discrepancy with regard to the factor of intelligence.

- Relationship with parents. Most researchers suggest that a poor relationship with parents could have a negative influence on the eating habits of adolescents (Mussen 1984:479).
- Physical appearance of parents. Many researchers suggest that adolescents develop a similar physique to their parents because they adopt the same eating behaviour (Jablow 1992:99).
- Emotions. Although researchers indicate that emotions can influence eating behaviour, no empirical findings could be traced regarding the influence of specific emotions on eating behaviour (Williams 1989:508).
- Personality. Although researchers confirm that personality can influence eating behaviour, very little research could be found on the influence of specific personality types (Carson 1992:245 and Hartley 1998:133).
- Media. Research has revealed that the media can influence the eating habits of adolescents. However, no research could be found regarding which source of the mass media has the most profound effect on the eating behaviour of adolescents (Jacobson 1997:76).
- Research with regard to how the order of the child in the family influences eating habits could not be found.

A measuring instrument such as the "Eating Attitudes Test" (Garner 1982) was developed to measure the symptoms and concerns characteristic of eating disorders. However, a measuring instrument that specifically measures the eating habits of adolescents, as well as factors that may cause unhealthy eating

habits could not be found. In order to assist teachers, parents and Educational Psychologists in promoting the development of healthy eating habits among adolescents, a universal standardised measuring instrument designed specifically for eating habits of adolescents will have to be created.

Furthermore, limited research has addressed the implementation and evaluation of school-based programmes aimed at the prevention of eating disorders. Only six empirical investigations could be found (Neil 1994:150-155, Allen 1996:341-343, Neumark and Sztanier 1995:64-70, Ahmad 1997:481-493, Nicklas et al 1997:315-320, and Valentini 1997:14-16).

Adolescence does not occur in a vacuum. It is highly dependent upon what precedes it and, likewise, adulthood is strongly influenced by what occurs during adolescence. If unhealthy eating habits that are acquired during adolescence persist into adult life, it could have important negative long-term consequences for health.

1.2 FORMAL STATEMENT OF THE PROBLEM

In the light of the foregoing, it appears that the problem of this investigation revolves round the following questions:

- *What can be considered as a healthy or an unhealthy diet?*
- *How do eating habits relate to adolescent development?*
- *Which eating behaviours could be considered to measure eating habits?*
- *Which factors influence eating habits?*

1.3 AIM OF THE RESEARCH

A literature study was carried out with the aim of

- establishing the nature of the concept of “eating habits”
- distinguishing between different types of eating habits
- analysing the factors that have an influence on eating habits and
- obtaining a theoretical background on adolescent development.

An empirical investigation was conducted in order to

- develop a measuring instrument that will quantitatively measure an adolescent’s eating habits.
- establish which factors relate to an adolescent's eating habits.

1.4 PROGRAMME OF THE RESEARCH

The present chapter deals with the awareness of the problem, analysis of the problem, aim of the research and sets out the research programme that was followed.

Chapter two provides an exposition of the concept of nutrition and a description of eating habits. This focuses on the nature of eating habits, the different types of eating behaviours and factors influencing the eating habits of adolescents. It outlines the nature of an ideal nutritional diet, as well as special nutritional needs of adolescents, in order to establish the norms for healthy eating habits.

Chapter three investigates the developmental aspects of adolescence, indicating the reciprocal effect of eating habits on development. The negative effect of unhealthy eating behaviour on the developmental process is emphasised.

Chapter four deals with the development of an instrument specifically designed to measure eating habits of adolescents since no such measuring instrument appears to have existed previously. This chapter also deals with the selection of the sample and the procedure followed during the empirical investigation.

Chapter five contains a discussion of the results of the empirical investigation. Conclusions are drawn regarding the kind of effect certain factors have on the eating habits of adolescents.

Chapter six deals with the educational implications of the research findings. Guidelines are provided on how to develop healthy eating habits among adolescents. These guidelines could be of use to curriculum developers, teachers, parents and counsellors. A brief evaluation of the research is provided and, finally, recommendations for further study and research are presented.

CHAPTER 2

NUTRITION AND ADOLESCENTS

2.1 INTRODUCTION

Adolescents adopt various eating habits that can result in an insufficient or an excessive intake of calories. An insufficient or an excessive intake of calories is unsatisfactory because it can have a harmful effect on one's health. It is important for adolescents to realise that unhealthy eating habits can be harmful.

In this chapter, ideal nutrition is discussed to establish the norms for a healthy diet for adolescents. Likewise, examples of dietary errors are outlined. This helps to determine the characteristics of an unhealthy diet.

Descriptions of various eating habits and eating disorders that manifest during adolescence are provided to serve as a yardstick for measuring adolescent eating behaviour. As explained in chapter one, various factors can influence the eating habits of adolescents, namely, external factors (parents, peers, media); internal factors (gender, birth order, intellectual ability, self-concept, personality, emotions); knowledge of nutrition and behaviour (eating habits, physical exercise). This chapter focuses on these factors and clarifies uncertainties regarding their influence on the eating behaviour of adolescents. Possible reasons are provided for the development of unhealthy eating behaviour and eating disorders.

2.2 A DISCUSSION OF NUTRITION

This section provides a definition of nutrition as well as an overview of the units used to measure energy, and nutritional values. It also gives guidelines as to the nature of an ideal diet, focusing on the nutritional needs of the adolescent.

2.2.1 THE CONCEPT OF NUTRITION AND THE IMPORTANCE OF NUTRITION

The word nutrition comes from the Latin root *nutri* – which means to nurture or nourish. If this is applied biologically, the word nutrition refers to the nourishment of the body. In order to nourish the body, food has to be taken into the body and chemically broken down in the cells to provide energy.

Nutrients are chemical substances that perform specific functions in the body. The body uses nutrients for

- a source of energy
- material for growth
- maintenance of body tissue
- regulation of body processes.

There are 40 known essential nutrients, which include macronutrients and micronutrients. Macronutrients such as carbohydrates, fats and protein supply energy and build tissue. Micronutrients such as vitamins and minerals are used in smaller amounts by the body. Vitamins are needed to maintain healthy organs. Minerals are essential components of blood, bone and teeth (Williams 1989:5 and Marotz 1997:290).

To maintain good health, our bodies require combinations of foods that provide nutritious meals on a daily basis.

2.2.2 UNITS AND NUTRITIONAL VALUES

Energy required by the body is provided by food and is measured in calories and kilojoules.

There are two recognised units of heat used to express the energy producing value of foods, namely, the calorie (C) and the kilojoule (kJ). The relationship between these units is expressed as follows: 4,2 kJ = 1 C (Huskisson 1990:300 and Webster 1996:190).

The following are examples of the amount of energy found in various macronutrients:

- 1 g of carbohydrates provides ± 17 kJ
- 1 g of lipids provides ± 38 kJ
- 1 g of protein provides ± 17 kJ

These examples indicate that lipids provide twice as much energy as carbohydrates and proteins. It is recommended that a person's nutritional requirements should be balanced so that 58% of the requirements come from carbohydrates, 32% from lipids and 10% from proteins. Taking in too much of one food group or too little or none of the others results in unbalanced nutrition and can have a harmful effect on one's health.

The prescribed kilojoules for a moderately active adolescent can be seen in Table 2.1.

Age (Years)	Male Kilojoules per day	Female Kilojoules per day
12 – 15	11700	9600
15 – 18	11300	9200

Table 2.1 Prescribed kilojoule intake for moderately active adolescents (Decker et al 1989:722)

2.2.3 THE NATURE OF AN IDEAL NUTRITIONAL DIET

A balanced diet refers to the correct quantity and the correct type of food. A good diet maintains optimal health and consists of carbohydrates, fats, proteins, vitamins, minerals and water.

The nutrients needed by our bodies are found in foods that are in their natural state. Canning, microwaving and boiling processes alter the natural state of foods. Therefore, a good nutritional diet is one that consists of natural products to which nothing has been added and from which nothing has been removed. These products include fresh vegetables, fruit and meat (Clark 1990:50 and Diamond 1985:XVII).

A food pyramid arranges food groups hierarchically. The amount of food needed by individuals from particular food groups decreases from the bottom to the top level.

The model in Figure 2.1 introduces a food pyramid.

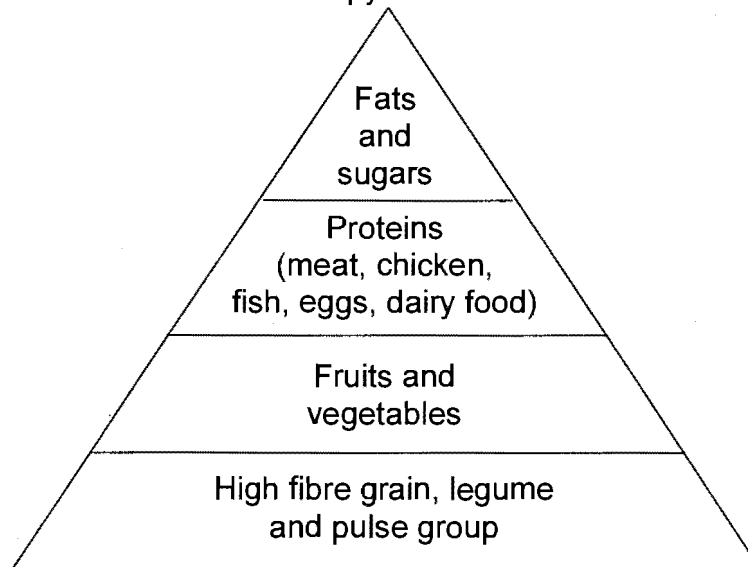


Fig. 2.1 A recommended food pyramid (Bell 1993:83)

The pyramid indicates that

- fats and sugars occupy a small space at the top of the pyramid
- proteins such as meat, chicken, fish, eggs and dairy foods occupy a space beneath the top of the pyramid
- fruits and vegetables occupy a broad area near the base of the pyramid
- high fibre grain, legumes and the pulse groups occupy the broadest area at the base of the pyramid.

Fats and sugars should be consumed in small quantities and can be added to food during the preparation of a meal or used as a desert to round off a meal.

Protein is one of the main nutrients of the meat group. The minerals copper, iron and phosphorus are found in meat. All B vitamins occur in meat and a high concentration of vitamin A is found in liver. Dairy foods include milk, cheese, yoghurt and ice cream, and contain calcium, phosphorus and vitamin A.

Vegetables are an important source of minerals, vitamins and cellulose. Large amounts of minerals, calcium and iron are found in beans, peas and broccoli. Vegetables help to meet the body's needs for sodium, chloride, cobalt, copper, magnesium, manganese,

phosphorus and potassium. Fruits contain vitamins, water and cellulose. Citrus fruits contain Vitamin C, and yellow-coloured fruits such as peaches contain carotene, the precursor of Vitamin A. Dried fruits contain iron. Figs and oranges are a good source of calcium. Research reveals that many parents neither consume fruit and vegetables themselves nor make them available in their homes, therefore, adolescents do not take in the recommended amount of vitamins and minerals (Neil 1994:151 and Nicklas et al 1997:315).

Dietary fibre is known as roughage. It does not provide nutrients but is an essential element in the diet. Roughage consists of plant cellulose and other indigestible materials found naturally in foods. The action of chewing fibre stimulates saliva flow and the fibre itself adds bulk to the content of the intestines, thus extending the time available for the absorption of nutrients during digestion. Dietary fibre also helps to promote bowel regularity and prevents constipation (Clark 1990:19-25).

See Table 2.2 for recommended daily allowances of the four food groups.

<u>Food Group</u>	<u>Recommended daily Amount</u>
Meat and fish (or appropriate Cooked vegetarian substitute such as eggs)	2 portions (1 portion = 60 – 90 g of meat, fish or poultry or 2 eggs or 1 cup of dried peas, beans, or lentils)
Milk and dairy products	2 portions (1 portion = 250 ml / 1 cup milk or 30g piece of cheese)
Fruit and vegetable group	4 – 5 portions (1 portion = a single fruit or 125ml (½) cup of vegetables)
Bread and cereal group	4 portions (1 portion = 1 slice of bread or 2 tablespoons of rice or ½ cup of cereal)

Table 2.2 A daily recommended food intake (Huskisson 1990:18)

The intake of water is important since it plays a role in temperature regulation, acts as a solvent in chemical reactions, is a lubricant in the body, assists with the digestion of food and transports many products in the blood and lymph. It is recommended that adolescents take in six to eight glasses of water each day. Too much water prevents the body from absorbing essential nutrients (Delport 1999:1).

2.2.3.1 SPECIAL NUTRITIONAL NEEDS OF ADOLESCENTS (12 – 18 YEARS)

Since various physiological changes take place during adolescence, it is necessary to comment briefly on the special nutritional needs of adolescents.

Nutrients are needed for the metabolic demands of growth: girls require 8400 to 10500 kJ a day, whereas boys require 10500 to 12600 kJ.

Adolescents require a high intake of protein for optimal growth and boys need particularly large amounts of protein for the development of muscle mass.

Minerals such as calcium and iron are particularly important during adolescence. Calcium plays an important role in bone growth and girls need a large amount of iron during menstruation.

Vitamins, especially the Vitamin B-group are needed in large amounts to meet the demands of energy metabolism and muscle tissue development during adolescence (Huskisson 1990:52 & 53).

2.3 AN UNHEALTHY DIET

If the adolescent does not take in sufficient nutrients, it can lead to poor health. The following section focuses on the nature of an unhealthy diet, unhealthy eating behaviour and the implications of an unhealthy diet.

2.3.1 THE NATURE OF AN UNHEALTHY DIET

Adolescents follow an unhealthy diet when they eat too much of one food group and exclude other categories of food.

Studies of unhealthy eating habits of adolescents reveal the following dietary errors:

- Poor quality breakfast. A breakfast without any protein could be considered to be a poor breakfast and results in insufficient absorption and distribution of protein needed by the body.
- Too little or no fruit leads to an ascorbic acid (Vitamin C) deficiency in the body.
- Unhealthy lunches. Lunch boxes filled with junk food are an example of an unhealthy diet because they do not provide the necessary amounts of protein, vitamins and minerals needed by the body. Many adolescents drink a lot of milk at lunchtime, which makes them feel full so they do not eat other foods. As a result, their intake of iron and vitamins may be low. Typical examples of the types of foods eaten by adolescents for lunch include hamburgers and pies, which are high in fat content. Some teenage girls impose caloric restrictions on what they eat and exclude protein, vitamins and minerals from their diet. This may be detrimental to their health.
- Unhealthy eating habits at supper are formed when there is no supervision by parents and some adolescents have to prepare their own meals. Because some adolescents do not eat properly at breakfast or lunch, they tend to use the evening meal as a time to refuel, and eat a huge dinner, which could lead to obesity.
- Most adolescents cannot choose between common foods on the basis of the fat, sugar, salt or fibre content because of their lack of knowledge of nutrition (Clark 1990:99 and Neil 1994:151).

The growth period of puberty is characterised by a large appetite. This can lead to adolescents satisfying their hunger with snack foods that are high in sugar and fat, and low in protein. Overeating during adolescence can result in obesity.

Adolescents who use alcohol damage their intestinal mucosa, which could negatively influence the absorption of nutrients.

Research indicates that the meal most frequently skipped is lunch, and most overweight adolescents skip breakfast. Those adolescents who skip lunch tend to overeat at supper, and overweight adolescents who skip breakfast overeat at lunch and supper (Williams 1989:510).

2.3.2 THE IMPLICATIONS OF AN UNHEALTHY DIET

This section outlines the various consequences of unhealthy eating.

2.3.2.1 MALNUTRITION

Any form of unhealthy eating leads to malnutrition and includes over-nutrition, under-nutrition and imbalanced nutrition.

The term “over-nutrition” describes the consumption of too many kilojoules. This may lead to obesity and associated problems such as respiratory disorders, high blood pressure, strokes, bone damage and digestive problems.

“Under-nutrition” is a term used to describe a deficiency of food with an insufficient kilojoule intake. Some adolescent girls diet to lose weight and this could result in malnutrition. The inability of a person to absorb and utilise nutrients is called malnourishment. Under-nourished adolescents tend to be irritable, have little energy and find it difficult to concentrate. This can limit their physical and cognitive activities (Williams 1989:509).

An insufficient kilojoule intake has a negative effect on an adolescent's cognitive and school performance. According to recent studies it was found that under-nourished children attain lower scores on standardised achievement tests, especially those that measure language ability (Ross 1995:9).

The term “imbalanced nutrition” describes the taking in of too much of one food group and too little or none of the others. The proportion of carbohydrates is usually high, with a lack of proteins and vitamins. This leads to deterioration in health and can result in kwashiorkor, circulatory diseases, arthritis and obesity (Austoker 1987:141).

2.3.2.2 FATS AND CHOLESTEROL

On-going research links too much fat in the diet to many of the diseases experienced in modern society. Here follows a brief explanation of the composition of fats and cholesterol, as well as the implications of too much in the diet.

Most fat that we eat is a neutral substance made up of three fatty acids combined with glycerol. Fats are the most concentrated source of energy and provide 37 kJ per gram, twice as much as carbohydrates and proteins. The body is capable of producing some of the fatty acids needed for growth itself, but is incapable of producing polyunsaturated fats known as "pufas", which are essential fatty acids.

Total cholesterol is a waxy substance, which can result in hardening of the arteries. It accumulates in the walls of blood vessels – especially those of the heart. This could restrict the blood flow to the heart muscle and can result in heart attacks.

High-density lipoprotein (HDL) cholesterol is the useful cholesterol that carries harmful cholesterol out of the arteries. Low-density lipoprotein (LDL) cholesterol is the harmful cholesterol that builds up in arteries. Exercise increases the HDL percentage and the higher the percentage of HDL present, the lower our risk of heart disease (Clark 1990:33 and Bell et al 1993:73).

Saturated fats increase the concentrations of LDL. These fatty acids are found in both animal and plant products. Animal products are the major source of saturated fat in the average South African diet. Sources of saturated animal fats include butter, cheese, full-cream milk, cream, ice cream, beef, pork and lamb. Saturated plant fat sources include margarine and vegetable oils. Many fast foods are prepared by frying in saturated fats, which eliminates the vitamin content (Huskisson 1990:157).

Coconut oil, cocoa butter and palm kernel oil are saturated vegetable fats found in commercially baked foods such as biscuits, creamers, cake mixes and chocolate, which are frequently eaten by adolescents. The high sugar content provides a temporary energy high and the methylxanthines in caffeine as well as theobromine in cocoa have mood

altering properties. A cup of cream delivers a high calorie count of 1443 kJ and 37 g of fat. A person's total fat-intake figure should be less than 30 g per day (Bell 1993:56).

One should guard against using the same oil repeatedly because the fatty acids become oxidised to form hydroperoxide, which is poisonous and can result in cancer. This is significant since we must assume that many fast food outlets use the same oil more than once to prepare their deep fried food.

2.3.2.3 VITAMIN AND MINERAL DEFICIENCIES

Prof Serfontein (1998) gave the following exposition of the implications of mineral and vitamin deficiencies in an interview on radio Forum. It is included here because mineral and vitamin deficiencies during adolescence have short- as well as long-term health implications. At least 130 symptoms of vitamin and mineral deficiencies have been identified. For example, muscle cramps experienced at night indicate a deficiency of magnesium, zinc and selenium.

Diseases such as heart disease, cancer, arthritis, diabetes and asthma can be caused by vitamin and mineral deficiencies. Chronic metabolic diseases occur worldwide and the incidences of cancer increase every year. Cancer, heart diseases and strokes are responsible for 71% of all deaths in the western world. Serfontein proposes that if the medical field concerned itself more with the aetiology of diseases rather than focusing on alleviating symptoms, it could extend lives in general by 30 years. This is significant in that, if adolescents were made aware of the pathological consequences of vitamin and mineral deficiencies, there might be a decrease in the number of diseases they experience.

In an experiment conducted with selenium, two groups of people were studied for a period of ten years. One group was given a selenium supplement and the other was not. The results showed that the group that received the selenium supplement had a drop of over 50% in the cases of cancer experienced. They had 63% less prostate cancer cases than the group that did not receive the selenium supplement. Selenium protects the cell walls from free radical damage and enhances the immune system's response. Sources of

selenium include seafood, (particularly tuna fish) meats, eggs, milk, whole grains and garlic.

Other minerals that are generally lacking from our diet are magnesium, zinc, and chromium. The body needs magnesium for fat and protein metabolism as well as nerve and muscle regulation. Sources of magnesium include green vegetables, milk, legumes and nuts. Zinc is linked to normal sexual development, regulates growth and appetite, and plays a role in neurotransmission. Sources of zinc include seafood, legumes and nuts. Chromium is needed to metabolise glucose properly, and food sources of chromium include prunes, peas, Brewer's yeast, cucumber, oysters, potatoes and apples.

According to Serfontein (1998), humans have a deficiency of fatty acids, and certain unsaturated fatty acids that we need cannot be manufactured by the body. These fatty acids are obtained from fish oils and green vegetables. The body is able to manufacture essential fatty acids from linoleic acid obtained from sunflower oil. The body can transform this fatty acid into other essential fatty acids biochemically, provided that other minerals and vitamins are present, namely, vitamin C, magnesium and zinc.

Two thousand heart disease risk patients were studied at the "Cambridge Heart Anti-oxidant Study" institute. One group received vitamin E and the other group did not. The results after six years indicated that the group that received vitamin E experienced 77% less heart attacks. The body needs 200 to 400 units of vitamin E daily and the best sources include plant oils, whole wheat and spinach.

The body's resistance to physical or chemical change can result in stress, which is experienced by many adolescents. These stress factors include

- physical factors
- psychological factors
- malnutrition.

The body's short-term reaction to physical or psychological stress is to release hormones such as noradrenalin and adrenalin, to prepare the body for the "fight or flight" mechanism. The "fight or flight" reaction is a primary method for protecting the body from

danger and immediately prepares the body for a condition that counteracts threats. These threats can be external or internal. Examples include, fear, pain, loss of blood and any form of stress. The body's long-term reaction to stress involves the release of hormones such as aldosterone and cortisone in an attempt to protect itself against stress. Eating disorders such as anorexia can be linked to stress. One of the central features of anorexia nervosa is an intense fear of becoming obese. The fear of putting on weight results in the adolescent experiencing stress. Girls experience more stress during puberty due to physical and physiological changes, and are therefore at a greater risk of developing unhealthy eating behaviour (Merlo et al 1993:25, Apfelbaum et al 1993:433 and Keel 1996:213).

An experiment using rats in Europe measured the content of vitamin C in their urine. A cat was then placed in the cage with the rats, and the vitamin C content was measured again. It was found that the amount of vitamin C in the urine had increased, which indicates that instead of the body mobilising more vitamin C to protect itself, the stress of seeing the cat resulted in the body excreting the vitamin C (Serfontein 1998).

The same reaction to stress occurs in humans. Due to metabolic reactions to stress, one tends to lose the essential minerals and vitamins needed by the body. During stress, the magnesium, chromium and vitamin C levels increase in urine. People who have a magnesium deficiency find it far more difficult to cope with stress. A magnesium supplement helps to correct the metabolic damage that is brought on by stress. This is significant because adolescents experience stress as a result of physiological and psychological changes. During the body's preparation for the "fight or flight" mechanism against stress, hormones can block magnesium's access to the cells. Prolonged submission to stress in turn results in the weakening of the immune system due to the shortage of vitamins and minerals.

Alcohol intake decreases the absorption of folic acid, thiamine, vitamins B₆ and B₁₂, magnesium and zinc. Smoking decreases the levels of ascorbic acid in white blood cells and in blood plasma. Many adolescents consume alcohol and smoke. Some adolescents consume alcohol and smoke when they experience stress. This in turn results in consequences that are harmful to the adolescent, as discussed earlier.

2.3.2.4 CHRONIC DISEASE RISKS OF ADULTS AS A RESULT OF FOLLOWING AN UNHEALTHY DIET DURING ADOLESCENCE

Autopsy studies have shown that hardening of the arteries, a common cause of coronary heart disease, is related to high blood cholesterol levels in adolescence. Unhealthy diets can be associated with the leading causes of death, namely, coronary heart disease, cancer and strokes. Other health problems include diabetes, high blood pressure and osteoporosis. Diet-related risk factors for coronary heart disease include high blood cholesterol, obesity and high blood pressure. Dietary factors such as under-nutrition, vitamin and mineral deficiencies, unsafe weight loss and eating disorders can be associated with colon, breast and prostate cancer. High blood pressure can be associated with an unbalanced maintenance of body weight and results in strokes or kidney failure. Non-insulin dependent diabetes mellitus is associated with obesity, an eating disorder experienced by some adolescents.

Osteoporosis, a decrease in bone density, can result in bone fractures. Adolescents who do not consume enough calcium, which is found in dairy foods, eggs and leafy vegetables, could encounter osteoporosis later in life.

Intense exercise, being underweight and eating inadequately can result in amenorrhoea. Amenorrhoea is a disorder experienced by females who previously had regular periods but who now stop menstruating. Amenorrhoea can result in premature osteoporosis, a greater risk of heart disease, and an inability to conceive easily.

Although amenorrhoeic females eat their required calories, they do so in non-traditional and chaotic eating patterns, especially during their adolescent years. For example, they eat little at breakfast and lunch and overeat at supper, or restrict themselves through the week and overeat at the weekends (Clark 1990:279).

2.4 DIFFERENT TYPES OF EATING BEHAVIOUR AND FACTORS THAT INFLUENCE EATING BEHAVIOUR

This section outlines various eating behaviours displayed by adolescents, including vegetarianism, eating junk food and crash diets.

The eating habits of adolescents are related to a number of different factors, which are discussed briefly below. These include: cultural, social, religious, family and emotional factors.

2.4.1 VEGETARIANISM AS AN EATING BEHAVIOUR

According to the vegetarian society (1998), 12% of secondary school children are vegetarians and, therefore, vegetarianism can be considered a prominent eating behaviour during adolescence.

A vegetarian is a person who follows a diet that includes plant foods, but avoids one or more of the following groups of foods: poultry, red meat, fish, milk and eggs (Robinson and Lawler 1982:286).

2.4.1.1 TYPES OF VEGETARIANS

Bell (1993:168) lists the main types of vegetarians as follows:

- Vegans: include only plant foods in their diet and do not eat anything of animal origin.
- Lacto-vegetarians: include plant foods, milk and other dairy products in their diet and abstain from meat, poultry, fish and eggs.
- Lacto-ovo vegetarians: include plant foods, milk and other dairy products. They do not eat meat, poultry and fish.
- Pesco-vegetarians: include plant foods and fish but do not eat eggs, meat, poultry or milk.

2.4.1.2 POSSIBLE REASONS FOR BEING VEGETARIAN

Adolescents adhere to a vegetarian diet for reasons such as

- parental influence
- religion (Seventh Day Adventists are lacto-ovo-vegetarians for health purposes and to exercise self-discipline.)

- concern about toxins such as uric acid in animal foods, or about being infected by salmonella
- ecological reasons where the rationale is that consuming raw foods is an efficient use of land resources
- economy (Vegetarian diets can be less expensive than those that include animal products.)
- health reasons (Vegetarian adolescents claim to feel healthier and believe that this eating behaviour helps them to maintain suitable weight.)
(Robinson 1982:286).
- ethical/moral reasons. Many young people experience the killing of animals to be immoral.

2.4.1.3 THE IMPLICATIONS OF VEGETARIANISM DURING ADOLESCENCE

Nutritional adequacy is not a problem for vegetarians who are knowledgeable about what they eat, but those adolescents who adopt a vegetarian diet to lose weight run the risk of a deficiency in nutrients needed by the body (Bell 1993:168).

Nutritional deficiencies, which can occur as a result of vegetarian diets, include the following:

- A low mineral intake – Vegetarians who do not eat food of animal origin are likely to have a low calcium, iron and zinc intake. Adolescents need calcium for bone growth and girls need to replace iron lost during menstruation. Zinc plays an important role in tissue growth and is a component of many enzymes involved in cell metabolism.
- A vitamin B₁₂ deficiency – Vitamin B₁₂ is found in animal foods only and a deficiency could lead to anaemia, degeneration of the spinal cord, weight loss and poor school performance (refer section 2.3.2.1).
- Malnutrition. New vegetarians tend to rely on and eat too much of one food type such as cheese or eggs. They therefore need to watch their fat intake since these foods are high in saturated fats and can have negative health consequences as outlined in section 2.3.2.2 (Middelman et al 1996:76).

The Complete South African Kilojoule, Calorie and Carbohydrate Counter (1989) (Clark 1990:51) points out that a vegetarian diet is usually low in one or more amino acids.

Vegetarians need to eat a wide variety of plant foods as well as milk and eggs to increase their total protein intake.

2.4.2 THE INGESTION OF JUNK FOOD

Surveys in America reveal that snacks can contribute from 20 to 50% of adolescents' daily calories (Clark 1990:68). The Australian Nutrition Foundation (Valentini 1997) found that many parents are relying on canteens to provide breakfast and lunch for their children because of the changing life-styles of modern day parents.

2.4.2.1 THE NATURE OF JUNK FOOD

According to the US Department of Agriculture (1990) (Bell 1993:57) junk foods include "those foods which do not contain at least 5% of the recommended daily allowance per 100 kilocalorie serving of protein, iron, calcium, vitamin A, thiamine, riboflavin, niacin and vitamin C." "Fast foods" is a term given to snack foods: those prepared quickly and mainly from processed foods. Examples include hamburgers, hot dogs, toasted sandwiches and pizzas. Most fast foods are high in kilojoules and in fats of the saturated kind (Huskisson 1990:19 and Bell 1993:73).

2.4.2.2 TYPES OF JUNK FOOD AND HEALTH IMPLICATIONS

Ross (1995:54) conducted a study to explore the food preferences and eating habits of children with a mean age of 11 years. A qualitative methodological approach was adopted utilising focus groups and observational techniques. Seven focus groups were used, and the composition of the groups was organised by the class teacher. A total of 46 children participated of which there were two mixed-sex groups, two male groups and three female groups. Analysis of the results indicated that pizza and chips were most frequently eaten. With regard to food preference, three out of seven groups mentioned pasta, curry, chicken, hamburgers, Chinese food, chocolate and sweets. Taste, texture, appearance, smells and satiety were found to contribute to food choices. Children were found to eat the same food as their friends and, therefore, social popularity was identified as another important factor in food preference. Children meet at fast food restaurants and influence one another's choice of food (Ross 1995:315).

Table 2.3 shows the fat and cholesterol content of some snacks and fast foods eaten by adolescents.

<u>Food Product</u>	<u>Amount</u>	<u>Fat(g)</u>	<u>Cholesterol (mg)</u>
<u>Ice Cream</u> Expensive brand (16% fat)	½ cup	12 – 18	40 – 50
Less expensive brands (10% fat)	½ cup	5 – 18	30 – 35
Potato chips	30 grams	10	0
Pretzels	30 grams	1	0
Cheese curls	30 grams	8	2
Popcorn	4 cups	10	5
Hamburger		28	80

Table 2.3 Bowes and Church's food values of portions commonly used (Clark 1990:51)

From the table, one can see that none of the food items are fat free. For food to be fat free it would have to contain less than 0,5 grams of fat per serving. A low fat serving refers to 3 grams or less of fat per serving. Hamburgers, ice cream, chips and popcorn are high in fat. A healthy diet limits fat to 25 % of one's calorie intake. Of the 2000 calories that an active adolescent eats per day, only 500 should be derived from fat. Since 1 gram of fat = 9 calories, one divides the allotted fat calories by 9 to determine the number of grams of fat in a healthy daily diet. An active adolescent is entitled to 500 fat calories ÷ 9 cal/g and is therefore allowed only 55 g of fat per day. This means that an adolescent who eats a hamburger, chips and ice cream would exceed the recommended fat intake for the day.

An ideal low cholesterol serving has less than 20 milligrams of cholesterol per serving. From Table 2.3 it is obvious that ice cream and hamburgers exceed the cholesterol recommendation. The meat in the hamburger, and the ice cream, both have a high percentage of saturated fat, which is high in cholesterol. Too much fat consumed by eating junk food is associated with obesity and coronary heart disease (Clark 1990:34 and Marotz 1997:302).

A typical fast-food meal includes a hamburger with chips and a fizzy drink or milkshake. This meal provides only half the caloric requirement needed by an adolescent boy and 40% more than his protein allowance (Lawer et al 1986: 27).

Adolescents tend to snack on glazed doughnuts, Tinkies, chips, fizzy drinks and sweets, which lack the nutrients needed for optimal development. Their diet tends to take on the shape of an upside down food pyramid. Junk food has been found to be low in calcium, fibre and vitamin A, and too high in kilocalories, saturated fats and sodium (Bigler-Daughten and Jenkins 1987:1678 and Cusatis 1995:27).

According to a National Survey of Dental Caries (1990) there is a strong link between sugar consumption and dental caries, which can result in acute infections, pain, costly treatment and tooth loss (Bartlett and Smith 1996:23).

Cold drinks are considered to be nutritionally “empty” and contain additives and caffeine. Fizzy drinks are popular thirst quenchers among adolescents. They offer no nutritional value apart from 150 calories of refined sugar, which is the equivalent of nine teaspoons of sugar. Caffeinated cold drinks can inhibit the absorption of iron in the body. Amounts of between 200 and 750 mg of caffeine per day can cause side effects such as irritability, high blood pressure and anaemia, since iron absorption is inhibited. Cola drinks (per 340 ml can) contain 32 to 65 mg of caffeine, and chocolate (per 30 g piece) contains six to 20 mg of caffeine.

2.4.3 CRASH DIETS AND DIETING AS AN EATING BEHAVIOUR

Crash dieting evolved from the amphetamine-driven 1960s to the 1990s with their liquid diets, and involves the exclusion of almost all foods except for a chosen few such as grapes or apples. These diets are nutritionally unbalanced and can have negative long-term health implications (Bell 1993:69 and Durrett 1999:44).

Many adolescents engage in crash dieting. In a high school survey of 1268 adolescents, aged 13 to 19, it was found that

- 36% were currently dieting

- 69% had been dieting before the survey
- 52% had begun dieting before age 14
- 14% were chronic dieters

(Williams 1989:509 and Moreno 1995:171).

Severe eating disorders are associated with dieting to lose weight. Dieting may also be associated with mental and physical symptoms such as fatigue, anxiety, depression, constipation, amenorrhoea, mental sluggishness, impaired performance and impaired growth (Clark 1990:270).

Weight loss formulas and pills are obtainable from pharmacies and form part of crash diets. Diet drugs on the street include amphetamines, laxatives, water pills, benzocaine, phenylpropanolamine and syrup of ipecak, to mention but a few. Amphetamines provide extra energy, decrease one's appetite and are highly addictive. Laxatives contain a variety of plant products that cause semi-fluid bowel movement and can result in cramps as well as other abdominal discomfort. Water pills contain antihistamines called pyrillamines, which can have side effects such as loss of appetite, nausea, vomiting, stomach ache, constipation or diarrhoea. Benzocaine, a local anaesthetic coated in hard candy or chewing gum, deadens the taste buds so that food has less flavour for the dieter. Phenylpropanolamine is a close relative of amphetamine and causes a temporary suppression of appetite. Syrup of ipecak is an extract from the root of the ipecak plant. Its effect is to irritate the wall of the stomach and cause vomiting. The prolonged use of laxatives damages the nerve supply to the colon resulting in permanent constipation, ulcers, massive loss of fluid or rebound fluid retention (Carson and Butcher 1992:333 and Van Zyl 1999:8).

Some adolescents use smoking to control their appetite and weight. This also decreases the levels of vitamin C needed by the body and inhibits the synthesis of other nutrients. Smoking is also linked to diseases such as cancer, emphysema, chronic bronchitis, osteoporosis and heart disease (Williams 1989:357).

Crash diets appeal to adolescents who have particular needs and concerns. For example, girls who are figure-conscious and boys who are muscle-conscious may respond to crash diet programmes in an attempt to attain a perfect figure (Williams 1989:357).

Recent research reveals that the body experiences dieting as starvation and is genetically programmed to survive periods of famine. When a person starves his or her body, the following processes occur:

- An increase in the rate at which one stores fat.
- Energy is conserved by slowing the body down and a person becomes less active.
- Burning up of muscle tissue to obtain extra energy.
- The body's fat reserve is conserved to outlast the "famine", which means that the more one diets the harder it is to lose weight (Van Zyl 1999:37).

Crash dieting is harmful to the adolescent since it interferes with the body's physiological metabolism. Crash dieting results in an adolescent experiencing lethargy and instead of attaining the perfect body, because muscle tissue is burnt up.

2.4.4 FACTORS THAT CONTRIBUTE TO THE EATING BEHAVIOUR OF ADOLESCENTS

Possible factors that cause adolescents to eat incorrectly are outlined below:

- Snackaholic teenagers who are too busy to prepare food eat convenient foods, which are easily obtainable from supermarkets.
- Parents who cannot find the time to prepare their children lunches compensate by giving them money to buy junk food.
- Social gathering of adolescents around fast food outlets.
- A lack of knowledge of the dangers of unhealthy eating.
- Excessive preoccupation with weight.
- Peer pressure.
- Mass media.
- Social norms.
- Cultural norms.
- Religion.

The following factors influencing the eating behaviour of adolescents are discussed briefly below:

- Cultural
- Social
- Religious
- Family
- Emotional

Social, family and emotional factors are discussed in detail in chapter three.

2.4.4.1 CULTURAL FACTORS

The cultural background of adolescents can determine how, when and what foods they eat. Traditional dishes and eating habits are closely linked to the culture and climate of a country as well as the availability of food.

Cultural groups that have influenced South African cookery and eating habits include the Dutch, Huguenot, Oriental, Voortrekker and black African peoples. It is important to note that the cultural influences that cause us to eat certain foods may be deeply rooted and difficult to change.

In poor sectors of society, people are forced to consume less food or a more limited variety of foods than their bodies require. In South Africa, agricultural foods such as maize are used to make, for instance, putu porridge, which is eaten by many black people. In poor families, the substitution of maize based bottle-feeding for breast-feeding results in malnutrition and diarrhoea. When too much starch is consumed, too few vegetables and too little fruit and milk, diseases such as pellagra may occur.

South Africa's traditional barbecues originated from Voortrekker influence, and many South Africans consume a lot of meat that is grilled over the coals. Meat, particularly red meat is a highly valued food and is associated with power, masculinity and virility (Barker 1996:277). Eating too much protein could result in malnutrition since too little fruit and starch, and too few vegetables are consumed. A high intake of meat can also result in high cholesterol, which can lead to heart disease. Some cultural eating patterns result in

malnutrition in developing countries. For example, Nigerian children rarely eat meat or eggs since they believe that the intake of these foods encourages theft. They further believe that the consumption of coconut milk will make them less intelligent (Williams 1989:359 and Van Zyl 1999:413).

2.4.4.2 SOCIAL FACTORS

Value systems such as equality, sociality, success and change can affect eating behaviour. The emphasis on sociality results in peer pressure and one of the pressures is to seek status within a social group. As part of a particular status group, one will eat or not eat certain foods, depending on whether they are accepted or rejected by the group. Foods such as caviar, expensive cheese and imported ice cream may be considered to be high status foods and will therefore be eaten by wealthy members of the group. Foods such as soups and stews may be considered to be low status foods and will be avoided by a wealthy social group (Williams 1989:350 & 511).

Research reveals that adolescents are highly influenced by the type of food eaten by their peer group. They tend to eat foods that are currently in fashion, such as hot dogs, ice cream, pizza, hamburgers, toppings and sauces (Robinson 1982:220).

Some adolescent girls follow strict diets to get thin in order to be accepted by their peers. On the other hand, underweight adolescent boys who are dissatisfied with their bodies take protein supplements and over-exercise in an attempt to build muscle tissue, so that they will be accepted by their peer group. Many adolescent boys take anabolic androgenic steroids (AAS) to enhance muscle growth, increase strength and improve physical performance. This drug, which is taken to gain a more muscular appearance, can result in cholestatic jaundice, stunted height, abnormal liver function and severe mood disorders (Drenowski and Yee 1987:627 and Goldberg 1996:1555).

2.4.4.3 RELIGIOUS FACTORS

Many religions place some restrictions on the consumption of certain foods. In the Middle East, bread is a symbol in religious ceremonies and in Mexico, corn is a staple food because of its religious significance. Pork is forbidden among Orthodox Jews and

Islamics. Hindus and Buddhists are vegetarian and do not eat the flesh of an animal, and many of them do not eat milk or eggs. Seventh Day Adventists are lacto-vegetarians and do not eat flesh foods. Fasting is common in many religions, and food may be abstained from or substituted for other foods (Robinson 1982:221).

From the above, one can conclude that religious factors may have an influence on the type of food eaten by adolescents, and that eating behaviour such as fasting may be compulsory. In some cases, religious restrictions on the consumption of certain foods could result in the adolescent following an unbalanced diet. No empirical investigations could be found on the influence of religion on eating habits.

2.4.4.4 FAMILY FACTORS

The family atmosphere can influence the eating habits of adolescents. An atmosphere of security and contentment reinforces positive images of food, whereas an atmosphere of tension and hostility creates unpleasant images or associations and can lead to rejection of food. If, for example, parents fight during meals, adolescents may associate food with a hostile atmosphere, which may result in a lack of appetite.

Adolescents may experience anxiety at meal times in an atmosphere where parents are anxious and rushed to maintain their lifestyles. Some parents cannot find time to prepare balanced meals and therefore use instant foods or buy take-aways from restaurants (Humphrey 1989:208, Valentini 1997:14 and Claude-Pierre 1998:79).

Other family factors that could influence the eating behaviour of adolescents include the available money spent on maintaining a balanced diet, the amount of food made available, parents' knowledge of nutrition, the type of food eaten by parents, and parenting styles in general.

Parents play an important role in influencing the eating behaviour of their children. In food-centred families, adolescents are encouraged to overeat and this eating behaviour could lead to obesity (Whitney 1984:238, Jablow 1992:99 and Brook 1997:287).

Research reveals that adolescents' knowledge of nutrition is insufficient, which could be a result of their parents' ignorance of nutrition. Ultimately, by controlling and preparing meals, parents determine what type of food is eaten (Neil 1994:151 and Brook 1997:283).

Autocratic, egalitarian, permissive and laissez-faire parenting styles have been found to have a negative effect on the eating behaviour of adolescents. This is discussed in detail in section 3.6.3 (Mussen and Conger 1984:479 and Snodgrass 1997:233).

2.4.4.5 EMOTIONAL FACTORS

Eating can be used as a catharsis for life's stresses. Factors that could cause adolescents to experience negative emotions include a difficult examination, being lonely, not having a date or having quarrelled with friends, or not having friends. Food can also be used as a weapon in that the adolescent may refuse to eat in order to attract attention or may overeat to compensate for negative experiences.

As a result of physical changes taking place during adolescence, emotions of anxiety and embarrassment are experienced. In adolescent girls, the increase of fat deposits in the abdominal and hip area can be a source of anxiety. Figure-conscious girls impose caloric restrictions on themselves, resulting in unhealthy eating habits.

Emotions of anxiety and rejection can be experienced because of an adolescent's need for peer group acceptance. They then engage in eating behaviour that will make them acceptable to the group. For example, a boy may overeat to appear masculine to the group (Epanchin and Paul 1987:179, Roth 1982:93, and Jablow 1992:52).

2.5 EATING DISORDERS

This section focuses on anorexia nervosa, bulimia and obesity, with regard to their characteristics, possible aetiology and health implications. These disorders will be discussed because unhealthy eating habits often lead to the development of eating disorders. Eating the wrong types of food could lead to obesity and bulimia. Dieting can lead to anorexia.

2.5.1 THE NATURE OF EATING DISORDERS

Eating disorders are psychological disorders characterised by severe disturbances in eating behaviour. They are considered to be syndromes, which are coded as “Eating disorders of adolescence and adulthood” according to the DSM III-R (Carson 1992:242).

Adolescents with eating disorders tend to have lower self-esteem, a negative body image, and experience feelings of inadequacy, anxiety, social dysfunction, depression and moodiness.

Anorexia nervosa, bulimia and obesity are eating disorders that share commonalities such as weight preoccupation, skipping of meals and diet-binge cycles. All eating disorders have a negative effect on an adolescent’s health, growth and intellectual development. Eating disorders start during adolescence and more than 90% of cases occur among females (Neumark-Sztainer 1995:64).

2.5.2 ANOREXIA NERVOSA

Anorexia nervosa is an eating disorder defined as a psychophysiologic aversion to food, which can result in life threatening weight loss (Williams 1989:509).

2.5.2.1 CHARACTERISTICS OF ANOREXIA NERVOSA

Characteristics of anorexia nervosa include:

- an intense fear of gaining weight
 - a belief that he or she is overweight
 - weight loss of 25% of the original body weight
 - amenorrhoea
 - body-image distortion
 - a refusal to maintain body weight within the lower limits of normal age and height
- (Carson 1992:242 and the American Psychiatric Association 1994).

As mentioned previously, many adolescent girls use restrictive eating practices as a strategy for weight control, and anorexia nervosa often begins as an extension of normal dieting.

2.5.2.2 AETIOLOGY OF ANOREXIA NERVOSA

Anorexia usually starts when adolescents experience feelings of inadequacy during puberty. When their bodies show signs of sexual maturity, they subconsciously yearn to escape from the adult world and diet to achieve a child-like figure (Frank 1996:55).

Socio-cultural factors can contribute to the development of anorexia. The popular image of slimness is promoted in films and in advertisements. The culturally prescribed thin body shape has resulted in female adolescents believing that if they accomplish low body weight, they will attain self-control and experience acceptance (Johnson 1987:670 and Keel 1997:213).

Anorexics report that they remember comments made about their eating habits during early childhood, which hurt them and contributed to the development of their eating disorder. Comments such as "She's as graceless as an elephant; Don't give her any more: she'll grow into a two-ton Tessie" were recalled by one anorexic. Children internalise negative comments made by others about their physique, and a negative self-image develops, which can result in anorexia.

Research indicates that the parents of anorexics communicate with their daughters in complicated ways. Parents communicate "double messages", which, although they express nurturing affection, at the same time serve as a disqualification of their daughters' attempts to express their opinions. The anorexic starves herself in response to these "mixed messages" (Carson 1992:243). Anorexic adolescents are often deeply but ambivalently involved with their parents in a power struggle to achieve autonomy. A mother in particular experiences discomfort when her daughter attempts to achieve self-autonomy, because she realises that her daughter is becoming an adult and would like her to remain a child. In an attempt to counteract her daughter's search for independence, the mother becomes excessively dominant and intrusive. In turn, the adolescent starves

herself in order to feel that she is in control (Humphrey 1989: 206, Carson 1992:243, Rhodes 1992:249 and Frank 1996:55).

Unhealthy eating habits such as crash diets can lead to anorexia. Dieting can result in the body's inability to recognise hunger. If adolescents do not eat enough food, malnutrition occurs. Starvation affects the physiological, physical, cognitive and personality development of adolescents. Dieting adolescents consider the symptoms of losing weight desirable, and pride themselves on holding out against hunger (Bruch 1980:169 and Killen et al 1994:357).

Research indicates that symptoms of anorexia and zinc deficiency are similar. This implies that anorexia could occur as a result of a zinc deficiency in the diet. In a study at the University of Kentucky, 10 out of 13 anorexic patients were found to be zinc deficient. When dieting, potassium depletion occurs and can result in cardiac failure. Adolescents who diet, deprive themselves of important vitamins and minerals that are necessary for optimal functioning (Holford 1997:192).

2.5.2.3 THE IMPLICATIONS OF ANOREXIA NERVOSA

Mortality rates of anorexia nervosa are among the highest recorded for psychiatric disorders. Treatment for this eating disorder is long and only 40% make complete recoveries (Neumark-Sztainer 1995:65).

Once relentless starvation begins, brain chemicals necessary for the transmission of nerve impulses (serotonin and norepinephrine) are reduced and this can lead to chronic anorexia nervosa. Starvation induces a feeling of euphoria by stimulating brain chemicals that help to block out unpleasant feelings.

Physical symptoms of anorexia nervosa include the following characteristics:

- muscle tissue wastes away
- sexual development is retarded and menstruation ceases
- skin becomes dry and yellow
- pain is experienced when touched
- hair loses texture

- blood pressure and metabolic rate drop
- anaemia
- severe sleep disturbances

(Whitney 1984:536 and Holford 1997:193).

The treatment of anorexia requires both psychological and medical intervention. Treatment involves a three-stage process:

- Firstly, normal nutrition is restored by tube feeding directly into the stomach if necessary.
- Secondly, family interactions are dealt with. By means of personal re-orientation, the client comes to see herself as having a separate identity from her parents and the right to self-respect.
- Thirdly, the client's misconceptions about nutrition are dealt with. Behaviour modification can be facilitated by means of a "contract" drawn up between the client and the therapist. Increasing rewards such as watching television and visits with other patients are given if there is progress in eating and some gain in weight.

(Whitney 1984:537 and Russell 1993:219)

2.5.3 BULIMIA

The word bulimia is derived from the Greek words "bous" and "limos". "Bous" means ox and "limos" means hunger. The word bulimia can be translated as "so hungry that you can eat an ox" (Van Zyl 1999:1).

Bulimia involves periodic binge eating, alternating with intervals of dieting. When binge eating, large amounts of food are consumed.

In a study of 1,093 high school students between the ages of 14 to 18, Van Thorre and Vogel (1985:45) found that the highest percentage of bulimia was among 14-year-olds.

2.5.3.1 CHARACTERISTICS OF BULIMIA

Bulimia combines elements from obesity and anorexia and has the following characteristics:

- Binge eating, accompanied by an awareness that the eating pattern is abnormal. A minimum average of two binge eating episodes a week over a period of three months.
- Binge eating takes place in private.
- A fear of not being able to stop eating voluntarily.
- Self-induced vomiting usually follows the binge eating.
- Depressed mood and depreciating thoughts.
- Repeated attempts following binges to lose weight with dieting, purging, misuse of laxatives, diuretics or enemas.

(Williams 1989:509 and Carson 1992:244)

The food that the bulimic binges on is usually sweet or starchy, requires little chewing and is high in calories. An average number of calories consumed per binge is estimated at 4800. The binge ends when

- the person feels that it would hurt to eat any more food
- the person goes to sleep
- the person is interrupted

(Pyle et al 1981:60).

A symptom that also enables one to identify bulimia includes damaged tooth enamel as a result of exposure to gastric acid when vomiting and is likely to be diagnosed when the bulimic pays a visit to the dentist.

Family and friends of bulimics have reported odd behaviour such as running water in the bathroom after meals to hide the sound of vomiting, disappearance after meals and petty stealing of food. These symptoms can help parents and significant others to identify bulimic behaviour.

Some bulimics disguise themselves as dedicated athletes. They use the dedication as an excuse for compulsive exercise to lose weight (Clark 1990:274).

2.5.3.2 AETIOLOGY OF BULIMIA

Common precipitants to a binge episode include

- feelings of anger
- problem-solving difficulties
- self-nurturing difficulties
- loneliness
- boredom
- a low blood sugar level

(Johnson et al 1987)

Bulimics avoid expressing anger because they fear interpersonal consequences such as disapproval, rejection or retaliation.

When bulimics have to make a decision they often binge because they tend to be perfectionistic. Obsessive tendencies keep them moving between alternatives. They believe that unless they make a perfect decision, catastrophe will reign.

Some bulimics have self-nurturance difficulties. They believe that they must be productive all the time. They think about the things that they are supposed to do or have failed to accomplish. In this instance the binge eating is used to relax or to distract them from their obsessive drive to achieve.

Many bulimics report that they are tense before embarking on binge eating and that boredom or loneliness make them more likely to succumb. Feelings of anxiety dissipate while the bulimic binges but return after the binge.

Bulimic bingeing occurs most frequently in the late afternoon and evening when the blood sugar level is low. It is characterised by a strong craving for food such as chocolate, ice cream, bread, biscuits or fatty foods to increase the blood sugar level. When the blood sugar level is too low a person may feel tired, listless, depressed, drowsy and sluggish and these feelings may lead to binge eating. The binge is followed by an increase in the blood sugar level and the person experiences irritation and jitteriness which results in

nausea. When the bulimic vomits she feels better because by vomiting, the blood sugar level is lowered. If the blood sugar level drops too low after vomiting, the bingeing process starts again (Johnson 1987:673 and Van Zyl 1999:7).

2.5.3.3 THE IMPLICATIONS OF BULIMIA

Bulimics usually keeps their eating behaviour secretive, and this usually generates shame and guilt in the sufferer. Bulimia lowers self-esteem, destroys a person's sense of self-control and creates social problems.

Physical consequences of bulimia include

- menstrual irregularities
- severe discomfort – reports of burst stomachs have been made
- over-stimulation of the pancreas during a binge can cause pancreatitis, severe stomach ache, increased heart rate and fever.
- frequent vomiting can cause a loss of the gag reflex, rupturing of the oesophagus, calluses on fingers, and the erosion of tooth enamel.
- the swelling of glands cause a painful swelling of the face.
- potassium loss, which negatively affects the functioning of the kidneys

(Carson and Butcher 1992:244)

Since society imposes an unrealistic ideal to be slender, adolescents can develop unhealthy eating patterns such as dieting to lose weight followed by overeating to compensate for hunger. When this eating pattern is practised frequently it can develop into bulimia.

2.5.4 OBESITY

Obesity refers to an excess of total body fat. It results from an imbalance of a person's food intake, physical activity and resting metabolism and causes a surplus of calories to be stored in fat cells.

The measuring and classifying of excess weight is done by means of calculating a person's Body Mass Index (BMI). The BMI is calculated by dividing a person's weight in kilograms by the square of his height in metres. The BMI is then compared to a BMI classification table.

The World Health Organisation (Gleick 1999:52) uses the BMI classification, which appears in Table 2.4.

<u>CLASSIFICATION</u>	<u>BMI (kg/m²)</u>	<u>RISK OF CO-MORBIDITIES</u>
Underweight	< 18,5	Low (but risk of other clinical problems increase)
Normal range	18,5 – 24,9	Average
Overweight	>25	
Pre-obese	25 – 29,9	Increase
Obese class I	30,0 – 39,9	Moderate
Obese class II	35,0 – 39,9	Severe
Obese class III	>40	Very severe

Table 2.4 BMI classification

A person who weighs 70 kg and is 1,75m tall will have a BMI of 22,9 – within the safe range. $70 \div (1,75 \times 1,75) = 22,9$.

Eating too much has become an eating habit for many adolescents. According to Neumark-Sztainer, (1995:64) a 39% increase in obesity and a 64% increase in super obesity occurred between 1963 and 1970, and 1976 and 1980. Recent research indicates that 20% of male and 25% of female adults are clinically obese (Gleick 1999:50).

2.5.4.1 AETIOLOGY OF OBESITY

Susceptibility can be determined partly by the body type endomorph, mesomorph or ectomorph.

- Ectomorphs have relatively long legs and arms, narrow fingers and toes, as well as a delicate bone structure.
- Mesomorphs have heavy bone and muscle development, broad hands and a muscular chest.
- Endomorphs are round, soft, have slender wrists and small facial features.
(Clark 1990:236)

The stocky endomorph is more likely to be obese than the athletic mesomorph or the thin ectomorph.

Other factors that may lead to obesity include the following:

- Feelings of boredom, loneliness – eating becomes a solace for the person.
- Ignorance of the calorie value of food.
- A fixation at the oral stage of psychosexual development – an obese person's life is orientated round oral gratification because his or her libidinal energies and psychological growth have not advanced to a more mature level.
- Overeating as a response to parental rejection or disturbances in parent-child relationships.
- An inability to distinguish between different internal signals because the adolescent has learned to respond to all signals of distress by eating.
- A response to external cues in the environment – obese adolescents respond to the sight and taste of food regardless of how many calories they are consuming.
- The environment – restaurants, TV commercials, vending machines and food stores provide stimuli that prompt adolescents to respond with certain eating behaviours. For example, an adolescent may continue to overeat because the food displayed looks and smells appetising.
- Disturbances in metabolic functioning.
- Variations in the number of fat cells in adipose tissue – over-nutrition during infancy can produce an excessive number of fat cells, which remain with the person throughout life.
- Stress – when emotional stress occurs, the body secretes hormones, which convert stored energy into glucose and fatty acids. When the person does not use the energy made available by the body, the body converts the glucose into fat. Some adolescents eat excessively during a stressful event.

(Robinson 1982:479, Clark 1990:236 and Carson 1992:330).

According to Ferrairi (1993:331) the main eating habits and attitudes responsible for obesity include

- high caloric diets with excessive protein and / or fat intake
- skipping breakfast, consuming several high-calorie snacks as well as overeating at lunch and dinner
- little physical activity, watching television and playing video games.

Many adolescents snack on high-calorie foods, skip breakfast and overeat at lunch and dinner. The lack of physical activity and the watching of television could be a way of avoiding pressures of social interaction or athletic participation for which they feel inadequate. The body's energy budget becomes unbalanced because the body's energy input should be equal to the body's energy output in the form of physical exercise.

Food-centred families encourage unhealthy eating habits such as overeating at meal times, rapid eating and excessive snacking. Children imitate overeating parents and many researchers have found that early eating habits influence a person's tendency to overeat throughout life (Whitney 1984:238). This finding suggests that overeating is a learnt behaviour pattern and can lead to obesity.

2.5.4.2 THE IMPLICATIONS OF OBESITY

If a person's weight is 20% more than average, life expectancy is decreased by 20% in males and 10% in females (Robinson 1982:476).

Overweight during adolescence can result in adult mortality. Obesity increases the risk of heart attacks, diabetes mellitus, hypertension, arteriosclerosis, gall bladder disease, osteoarthritis and certain cancers.

Concern about personal appearance can make an adolescent more reluctant to participate in physical activities and this means that the overweight adolescent is unable to use recommended ways of controlling weight.

Obese adolescents often have to deal with social criticism, rejection and discrimination. Examples include

- becoming self-derogatory about their appearance because of peer group conformity to be thin
- being ridiculed by classmates and humiliated by teachers
- being less sought after in heterosexual relationships, which can result in low self-esteem
- not being accepted for entrance at tertiary institutions. Research indicates that fat people have only a third of the normal chance of being accepted at a tertiary institution. (Williams 1989:510)

The consequence of having to deal with criticism, rejection and discrimination leads to the adolescent becoming obsessively preoccupied with being fat. The adolescent becomes timidly withdrawn, eager to please and tolerant of abuse. An overweight adolescent could overeat as a substitute for love and friendship. Eating is experienced as less threatening than rejection (Bruch 1980:169).

In search of their own identity, it is important for adolescents to wear fashionable clothes. Obese adolescents struggle to find attractive clothes that fit them and this could hinder the development of a positive self-concept.

Many overweight adolescents turn to fad diets, diet pills and diet formulas in an attempt to lose weight. These drugs reduce the person's appetite temporarily and when the user's appetite returns to normal, weight is regained. Diet pills used to reduce appetite can cause dependency on the drug. When adolescents regain weight, the cycle continues whereby they experience low self-esteem, seek comfort in food and continue to grow fatter.

Popular advertisements used by dieting agencies now read, "Eat as much as you want and still lose weight." Many starch blocker preparations have been on the market since 1982. Starch blockers inhibit amylase (a starch-digesting enzyme) from digesting carbohydrates. The result is that the carbohydrate is excreted by the body and not assimilated into the cells of the body. Research indicates that the inhibitor does not work

effectively and that side effects such as nausea, vomiting and diarrhoea are experienced by users (Bo-Linn 1982:1413).

Many overweight adolescents sit in the sauna of a gymnasium for hours and buy machines that enable them to exercise passively. Hot baths and saunas do not speed up the metabolic rate, but dehydrate a person and, therefore, a loss of weight is indicated on the scale. Passive exercise does not lead to an expenditure of calories but improves muscle tone (Whitney 1984:245).

Some obese people turn to surgery to reduce weight. These procedures include the disconnection of a portion of the small intestine to reduce absorption, the stapling of the stomach to make it smaller, or liposuction. The side effects of surgery include scars, liver failure, frequent diarrhoea, kidney stones, intestinal infection and malnutrition. Surgery is very expensive and people who have liposuction treatment continue to overeat after surgery and regain the fat that has been surgically removed.

From the above, it seems that overweight people tend to use unsuccessful means to lose weight. This is partially because the person needs to undergo some form of behaviour modification to lose weight and to maintain weight loss. In the case of an adolescent who overeats to cope with changes that occur during adolescence, therapy would have to focus on identity formation, learning social skills and the development of a positive self-concept.

Adolescents who have become overweight because of unhealthy eating habits, have to undergo behaviour modification techniques such as learning to eat slowly, eating at meal times only, and putting their forks down while they chew.

Overweight adolescents who eat in response to external cues and not to internal cues of hunger, find it helpful to keep a food diary in which they record the circumstances surrounding their eating. This includes time, place, food eaten, amount of food eaten, the reason food was eaten and their mood. This helps adolescents to evaluate what causes them to eat and to learn to control these stimuli (Whitney 1984:259).

Together with behaviour modification the successful treatment of weight loss involves adopting a diet that is not high in calories and exercising regularly. Support groups such as Weight Watchers and Overeaters Anonymous are valuable in helping an obese adolescent in the weight losing process.

2.6 CONCLUSION

The literature study in this chapter reveals that adolescents develop various unhealthy eating patterns that result in the body receiving too little or too much of the caloric intake they need.

It is apparent that eating behaviour exercised by adolescents can result in the development of eating disorders. The literature study further reveals that chronic diseases can be experienced during adulthood as a result of unhealthy eating behaviour during adolescence.

Various factors have been identified as possible reasons why adolescents develop unhealthy eating behaviour. These include

- a poor quality breakfast or no breakfast
- too little or no fruit
- a lack of knowledge of nutrition
- parents who create an unpleasant atmosphere at meals
- social norms
- cultural norms
- religion
- parenting styles
- interpersonal relationships
- gender
- intellectual ability
- participation in sport.

The following chapter looks at the developmental aspects of adolescents in order to establish why adolescents are so susceptible to developing unhealthy eating patterns and eating disorders. The influence of an unhealthy diet on developmental aspects of adolescents is also investigated.

CHAPTER 3

DEVELOPMENT DURING ADOLESCENCE

3.1 INTRODUCTION

This chapter discusses physical, cognitive, personality, social and emotional development during adolescence, because these changes can result in unhealthy eating behaviour with a negative effect on the developmental process.

Included is a description of physical and physiological changes during adolescence. These changes are then related to the development of disturbed eating behaviour.

Cognitive development is discussed as well as the effect of an unhealthy diet on mental development.

Various personality theories, namely, Erikson's psycho-social theory, Bandura's social learning theory, Maslow's humanistic theory and Kelly's personal construct theory are outlined to explain how eating behaviour patterns are acquired.

The influence of social and emotional development on adolescents' eating behaviour is also discussed.

3.2 THE NATURE OF ADOLESCENCE

According to Mwamwenda (1995:63) adolescence is a period of "great physical, social, emotional, physiological and psychological change." Clark (1992:379) defines adolescence as a challenging period of growth. Some of the following goals are mentioned as the focus during this phase of life, namely, to achieve independence, discover one's identity as a person, establish personal values, develop self-guidance, explore sexuality and acknowledge intellectual power.

Adolescence can be defined as a period characterised by a rapid increase in height, weight, hormonal changes, sexual maturation and wide swings in emotions.

Adolescence commences with puberty and can be divided into three stages, namely:

- Early adolescence: Girls: \pm 12 years (with a range between 9-15 years)
Boys: \pm 14 years (with a range between 12-16 years)
- Mid-adolescence: \pm 14-16 years.
- Late adolescence: \pm 17 years onwards

(Mussen 1984:463).

Development of pupils at high school extends over the period of early, mid and the beginning of late adolescence.

Maturational changes of adolescence are manifested in the following areas:

- Physical
- Cognitive
- Personality
- Social
- Emotions

These changes affect development and can influence the eating behaviour of adolescents. Adolescents may overeat or undereat in an attempt to cope with the physical, mental, social and emotional transitions from childhood to adulthood.

3.3 PHYSICAL DEVELOPMENT DURING ADOLESCENCE

The influence of physical and physiological changes on eating behaviour as well as the effect of unhealthy eating behaviour on physical development are discussed in this section. Sheldon's Constitutional Theory with reference to predisposed eating behaviour will also be outlined.

3.3.1 PHYSICAL CHARACTERISTICS AND PHYSIOLOGICAL CHANGES

During adolescence the following physical and physiological changes occur:

- Growth rate increases in girls between 11 and 14 years and in boys between 13 and 16 years.
- Oil glands secrete more oil.
- Development of breasts, axillary and pubic hair in females.
- The fat content of a girl's body increases from 10% at 10 years to 24% at 14 years.

- Girls begin to menstruate at \pm 14 years.
- Development of pubic, facial and axillary hair.
- The deepening of the voice in males.
- Spermatogenesis at \pm 12 years old in males.

(Robinson 1982:366)

Research reveals that first menstruation has dropped from 17 years old to 13 years old and is still dropping. Earlier maturing girls tend to have a more negative attitude toward their bodies and are at a high risk for the development of unhealthy eating habits. On starting menstruation, some adolescent girls believe that they have to change into a mature adult overnight and they do not eat in an attempt to gain a sense of control in delaying the process of puberty (Monro 1996:91, Strattin and Magnusson 1990 and Graber 1994 in Halpern 1999:721).

The image that people have of their body has a significant influence on their self-evaluation (Gerdes 1981:66). Adolescents are conscious of their changing physical appearance and the way in which they experience this change will affect their self-esteem. According to Jacobson (1997:8) boys tend to experience physical maturation as an improved body image because of an increase in size and muscle development. For girls, physical maturation tends to lead to dissatisfaction with their appearance.

Development of sweat glands occurs in both boys and girls and can lead to an outbreak of acne (skin's eruption with pimples). Skin problems, which often occur during adolescence due to hormonal changes, may cause unhappiness, anxiety and negativity. The adolescent feels embarrassed about his or her skin problems and this can result in the development of a low self-esteem with regard to the physical self.

Physical development during adolescence gives rise to subjective experiences, which include the following:

- security based on physical strength
- self-esteem based on sport achievements
- acceptance based on physical appearance

3.3.2 THE EFFECT OF PHYSICAL DEVELOPMENT ON EATING BEHAVIOUR DURING ADOLESCENCE.

Cooper et al (1985:129) as well as Garner et al (1985:255) both confirm that eating disorders can be linked to maturity fears. The physical and physiological changes that take place make adolescents aware of impending adulthood and consequently, some of them undereat in an attempt to maintain their child-like physique.

A body image is the medium through which relationships are formed, and a late growth spurt in boys can be a negative experience because physical growth is a mark of maturity. Males who mature late tend to be self-conscious, restless and overeat in an attempt to look physically mature.

Body fat is an important factor related to disturbed eating habits during adolescence (Keel 1996:214). A fat adolescent girl is unhappy because she may be rejected by peers, who place great emphasis on physical appearance. An obese female adolescent tends to eat in order to relieve strain. She comforts herself with fizzy cold drinks, cakes and sweets. Her weight tends to function as a defence mechanism against tension and anxiety experienced during puberty.

Clinical descriptions of male and female anorexics conclude that the male's motive is to achieve an athletic build and the goal of the female is to be thin (Anderson 1984:901 and Yager 1984:427). A girl tends to starve herself when she is sensitive about her appearance and discontented with feminine curves.

Adolescent boys show a tendency to deposit adipose tissue on the lower torso, which may suggest a feminine body contour. Although it disappears with time, the male who is preoccupied with appearing masculine experiences anxiety. In a case study, Michael aged 14 said, "I used to get teased about being chubby. I began exercising for hours and hardly ate anything. But it made me feel so miserable. I didn't want to go out and couldn't concentrate at school" (Sanders and Myers 1995:13).

Adolescent girls who do not have a boyfriend tend to believe that they are not attractive enough and starve themselves in order to be accepted by the opposite sex. Dieting can lead to the development of anorexic behaviour (Monro 1996:69).

An ideal physical appearance is emphasised daily through various media. Modern western society advocates by means of the media that a slim girl would be more likely to have a positive self-image than a plump girl (Gerdes 1981:67). The media promotes the popular image of slimness, and society's prescribed body shape has resulted in the development of unhealthy eating habits. Adolescents absorb overt messages from the media of being thin, happy, sexy and independent, as literally true (Gerdes 1981:67 and Johnson 1987:670).

Nichter (1994:109) in his interviews with eighth and ninth grade girls found that they believe that to be popular with boys they have to be thin. Recent data on an adolescent's perception of health norms reveals that girls tend to be more concerned about their physical attractiveness than their health.

Black adolescent girls tend to be significantly more overweight than white girls and yet they appear less preoccupied with weight (Kumanyika 1987:31). Black adolescent girls tend to be more satisfied with their weight and figures, and research indicates that they are less likely to internalise the standards of the media to be thin (Allan, Thombs and Mahoney 1993; and Rucker & Cash 1992 in Halpern 1999). Schreiber (1998) in Halpern (1999:721) further found that black girls equate greater body fat with feelings of being healthy, pretty and more like a woman.

Anabolic activities in the body increase during adolescence and therefore nutritional requirements are greater than they are during adulthood. Recommended dietary allowances as outlined in chapter two, ensure that optimum growth and development take place during physical development. According to Robinson (1982:366), a deficit of 10 Kcal per kilogram of body weight can lead to growth failure and reduced nitrogen retention. It is recommended that adolescents should consume iodised salt because of their high rate of energy metabolism and the increased activity of the thyroid gland.

According to Holford (1997:129) stimulants such as coffee, cigarettes and high sugar diets can result in sex hormone imbalances. In chapter two, the detrimental effect of dieting on the development of sex hormones was outlined (refer section 2.5.2.3). Smoking is said to be associated with a greater intake of saturated fats and a decrease in physical activities. Many researchers have found that smoking is also associated with a reduced intake of important vitamins, minerals and fibre (Fehily et al 1984:827, Fulten 1988:797, Klesges 1990:784, Marks 1991:441, Margetts 1993 in Coulson et al 1997:208 and Crawly 1996:306).

A decline in the growth rate of boys during adolescence is partly due to a low intake of zinc. Zinc is an important nutrient for sexual maturation and growth for both sexes and is found in seafood, legumes and nuts (Holford 1997:215).

In a 24-hour dietary recall, research showed that athletes eat unbalanced meals (Chapman 1997:445). Athletic adolescent females tend to be concerned about their weight control and do not pay attention to the energy demands of their sport. Only 43% of athletes were found to take vitamin supplements and a need for sports nutrition education was revealed.

High levels of oestrogen are linked to premenstrual carbohydrate cravings in girls. A female tends to feel bloated and fat due to premenstrual weight gain and diets, thereby depriving herself of the physiological need for calories, resulting in a calorie-deficient diet. This deprivation results in hunger and the adolescent girl craves sweets. Some girls binge on sweets and this eating behaviour can develop into obesity or bulimia (Barr, Janelle & Prior 1995:39).

Dieting during adolescence can affect physical growth and sexual maturation in the following ways:

- Height potential may be compromised if dieting occurs before a girl starts to menstruate. Most girls reach their full growth potential before menstruation begins.
- A twelve-year-old anorexic with diminished weight does not have enough fat stored for puberty to progress, and sexual maturation is affected. She tends to be more flat-chested than her peers.

- The ceasing of menstrual periods in girls and a sense of control for being able to reverse the biological process.
- Since a boy's development occurs later than that of a girl, dieting has more serious consequences with regard to height and sexual development.
- Starvation-related irritability and apathy is experienced because the body's fat stores are depleted, including those of the brain (Jablow 1992:51).

The development of unhealthy eating habits such as dieting can lead to the development of anorexia with harmful consequences. By not consuming the necessary nutrients needed by the body, an adolescent impedes physical growth and sexual maturation.

Overeating and the development of obesity can have the following negative effects on the physical and physiological wellbeing of adolescents :

- Bone and joint problems: The spine and long bones can be deformed by excess weight during the development of the skeleton, resulting in knock knees or flat feet.
- Increased susceptibility to respiratory problems.
- Increased blood pressure and hypertension.

Unhealthy eating habits such as overeating can lead to obesity, skeletal deformity and physiological problems. Skeletal abnormalities result in the adolescent feeling embarrassed about his or her deformity and this contributes to the development of a negative self-image (Jablow 1992:95).

Santrock (1986:402) warns that "While young adults can draw on physical resources for a great deal of pleasure, the fact that they can bounce back so easily from physical stress, exertion and abuse, may lead young adults to push their bodies too far." This means that adolescents might get away with unhealthy eating habits initially, but they pay the price at a later stage in life.

3.3.3 SHELDON'S CONSTITUTIONAL THEORY

Sheldon proposed that there is an association between the structural and behavioural characteristics of a person. According to him, constitution refers to: "those aspects of the

individual which are relatively more fixed and unchanging – morphological, physiological, endocrine function etc. – and may be contrasted with those aspects which are relatively more labile and susceptible to modification by environmental pressures, i.e. habits, social attitudes, education etc.” (Sheldon 1944:2)

The question arises of whether an adolescent’s physical constitution will determine his or her eating behaviour. If a positive relationship exists between physical constitution and eating behaviour, then Sheldon’s theory could lend itself to the provision of educational guidelines. If an adolescent is aware of his or her physical predisposition, he or she may be able to modify the tendency to develop certain eating behaviours.

Sheldon’s theory describes primary and secondary morphological constitutions.

Primary morphological constitutions include:

- Endomorphy – an endomorphous person is characterised by a softness and a rounded appearance. The endomorph has a low specific gravity. The person's body floats in water and has a highly developed digestive viscera and functional elements develop primarily from the endoderm embryonic layer.
- Mesomorphy – this type of physique is characterised by the predominance of bone, muscle and a rectangular shape. The mesomorph tends to be equipped for strenuous and exacting physical demands. The dominant elements of this physique are derived from the mesoderm embryonic layer.
- Ectomorphy – a person in this category is thin, fragile, has a flat chest, large brain and nervous system in proportion to his or her size. His or her physique is derived from the ectoderm embryonic layer.

Secondary morphological constitutions include:

- Dysplasia – this category refers to the uneven mixture of the three primary components. More dysplasia is observed in the female physique than in the male physique.
- Gynandromorphy - this represents the extent to which the physique characteristics are associated with the opposite sex. The male tends to have a soft body, wide hips, long eyelashes and small facial features.

Sheldon identified the following personality traits:

- Viscerotonia – a person in this category tends to love comfort, has a gluttony for food as well as a need for sociability and affection. According to Sheldon (1944:543) “the digestive tract is king, and it’s welfare appears to define the primary purpose of life.”
- Somatonia – action, power and domination is important to this person and a strong need for muscular and vigorous physical activity is indicated.
- Cerebrotonia – this person is characterised by being restrained, secretive, self-conscious, sleeps poorly and attempts to avoid attracting attention.

A person with an endomorphic constitution and a viscerotonia personality could be predisposed toward overeating and becoming obese.

A person with a high mesomorphic constitution and a personality that tends toward somatonia could be predisposed toward overeating because of a high energy output. Should this type of person stop exercising and continue to overeat he or she could become obese.

A person with an endomorphic constitution and a personality that tends toward cerebrotonia is predisposed toward developing anorexia because of being self-conscious.

3.3.4 THE IMPLICATIONS OF SHELDON'S THEORY

According to Jablow (1992:94) a physical constitutional predisposition exists. If one parent is obese, a child has a 40% chance of becoming obese, and if both parents are obese the risk is 70% or 80%. Stunkard in Jablow (1992:99) studied the influence of heredity on weight and found that there is a strong correlation between a person's biological composition and weight.

Research indicates that female physiques tend to be more endomorphic than male physiques. Girls with a linear physique are slower to reach physiological maturity during adolescence. Late-developing boys are likely to have an ectomorphic body type (Jacobson 1997:9).

Sheldon believes that a child can be guided into avoiding aspirations and expectations inconsistent with his physical and temperamental potential. This implies that if adolescents knew more about the predisposed structure of their bodies, they would be more conscious of the forces that impel their behaviour. For example, an adolescent with an endomorph physique and a temperament that tends toward viscerotonia could be predisposed to overeat. On the other hand, a male adolescent with a gynadromoph physique and for whom it is all-important to have a masculine physique will tend to over-exercise and overeat to achieve an athletic build.

The constitutional theory emphasises a correlation between physique and personality, providing descriptive concepts for measuring physique and behaviour. The advantage of Sheldon's theory is that it gives a person an objective measurement of physique. The disadvantage of his theory is that some people believe absolutely that a predisposed physical constitution determines the way in which a person behaves. His theory tends to advocate that hereditary factors alone produce physical and behavioural characteristics.

3.4 COGNITIVE DEVELOPMENT DURING ADOLESCENCE

Cognitive development is characterised by an adolescent's ability to think hypothetically, apply formal logic and to use abstract concepts. In this section, the influence of cognitive development on eating behaviour as well as the effect of unhealthy eating behaviour on

mental development is discussed. Piaget's theory is outlined, with reference to developmental stages of intelligence.

3.4.1 WHAT IS COGNITION?

Cognition refers to the mental activities involved in the acquisition, processing, organisation and use of information (Mussen 1984:219). Webster (1996:255) defines cognition as "the act, power or faculty of apprehending, knowing, or perceiving".

3.4.2 COGNITIVE CHARACTERISTICS OF ADOLESCENTS

During early adolescence (\pm 12-14 years), thinking is primarily concerned with the "here and now". This type of thinking operates largely on a concrete trial and error basis. The early adolescent shows little concern for future plans and lives on a day-to-day basis. Cognitive development during mid-adolescence (boys \pm 14-16 years, girls \pm 13-16 years) is characterised by the ability to reason, understand abstract concepts, introspection and self-analysis. Adolescents are capable of problem-solving and scientific thinking (Gerdes 1981:68). Late adolescence (\pm 17-20 years) is characterised by more reflective adult reasoning and adolescents can appreciate a more extended time perspective (Gillis 1992:72-75).

The brain continues to develop during adolescence. The number of neurons does not increase but proliferation of support cells that nourish the neurons occurs. Myelination, which establishes faster neural processing continues (Jacobson 1997:9).

3.4.3 PIAGET'S THEORY OF THE DEVELOPMENTAL STAGES OF INTELLIGENCE

Piaget (1958), a developmental theorist, states that children pass through stages on their way to developing adult cognitive thought. He views intelligence as being "the co-ordination of operations" and that the gradual acquisition of reversible operations is the essence of intellectual growth (Mussen 1984:447).

His theory is concerned with the qualitative nature of intelligence. It is of educational

significance because it proposes that an adolescent can be cognitively educated into viewing developmental changes as a challenge and not as a threat. Sheldon believes that a person's cognitive structure is almost fully developed by the end of the stage of formal operations (12 years onwards).

Gerdes (1981:284) outlines the important characteristics of operational thought as follows:

- Formal operational thought is abstract: Thinking has moved from objects to ideas. Ideas may relate to complex matters such as moral issues, jokes and everyday concerns.
- Hypothetical deductive thought: The adolescent is able to form hypotheses and solve problems involving relationships. He or she reasons from the general to the specific, and can reach logical conclusions. He or she can also reason from the specific to the general.
- Inter-prepositional logic: This refers to the ability to test for logical consistencies and to detect inconsistencies between different statements.
- Anticipation of the consequences: This aspect involves the ability to consider and to anticipate the consequences of actions.
- Introspection: This characteristic involves an ability to think about one's thoughts and involves self-appraisal.

3.4.4 THE IMPLICATIONS OF COGNITIVE DEVELOPMENT ON EATING BEHAVIOUR AND THE EFFECT OF UNHEALTHY EATING BEHAVIOUR ON MENTAL DEVELOPMENT

The ability of an adolescent to consider his own thoughts during the developmental stage of formal operations results in more introspective thinking. This means that he is able to evaluate himself, not only in terms of observable characteristics but also with regard to abstract ideals. These abstract ideals in turn are influenced by the cultural environment, parents, peers and significant others.

Adolescents can experience depression if there is a discrepancy between their actual and a perceived ideal physical appearance (Vrey 1979:180). For example, a short, plump adolescent who would ideally like to be tall and thin can experience feelings of depression. These negative feelings can result in overeating as a form of consolation or it can result in undereating to obtain an ideal slim figure.

Adolescents need to be provided with opportunities to experience constancy in order to discover their ideas about the world. For example, an adolescent who is given many opportunities to experience the universal fact that all teenagers undergo puberty, is more likely to experience development changes as a challenge. Likewise, an adolescent who is provided with many opportunities to experience unconditional love and acceptance (regardless of the development changes taking place) will experience adolescence as less threatening.

Current research indicates that low academic aptitudes place both sexes in the risk group of developing unhealthy eating behaviour and can lead to eating disorders (Canals 1996:448). Adolescents with a low academic aptitude become preoccupied with thoughts about themselves and their introspection can be manifested in unhealthy eating habits.

Adolescents tend to conclude that people are scrutinising their appearance, thoughts, feelings and personality characteristics (Enright 1979 in Mussen 1984:477). This increases self-consciousness and leads to a greater preoccupation with the self. Self-consciousness and preoccupation with the self result in the development of unhealthy eating habits in an attempt to deal with negative thoughts. For example, an adolescent girl who puts on weight during puberty may be self-conscious about her weight gain and may diet in order to lose weight. A short, thin adolescent boy may be self-conscious about his appearance and overeat in an attempt to develop a masculine appearance.

Recent research reveals that adolescents who develop eating disorders such as anorexia and bulimia want to be perfect in every area of their lives. They are very successful academically and despite their high academic aptitude, they have a very low opinion of themselves. Anorexics are unable to distance themselves cognitively as neutral spectators of their bodies, and continue to express concern about putting on too much weight (Mussen 1984:551 and Sanders 1995:11).

According to researchers at the Massachusetts Institute of Technology, (cited in Holford 1997:147) the higher the proportion of refined carbohydrates such as sugar, commercial cereals, white bread and sweets in the diet, the lower the IQ score. A difference of 25 points was found between the IQ scores of high and low sugar eaters. As we have seen in chapter two (section 2.4.2), adolescents tend to eat a lot of junk food and this could have a profound effect on their cognitive development. Unhealthy nutrition can have a negative effect on achievement levels and classroom attention (Walker 1998:10). Anaemia (an iron deficiency in the diet) in particular is associated with poor school achievement. Adolescents who received iron supplements increased on two tests of cognitive function (Seshradi & Gopaldas 1989:675).

Teachers report that pupils who skip breakfast show signs of being apathetic, inattentive and disruptive in the classroom. They attribute this to the adolescent being hungry, and it affects their cognitive performance. Breakfast is a central component in the total daily energy and nutrient intake. Adolescents who eat breakfast tend to make fewer errors in arithmetic tests and continuous performance tasks. Many adolescents do not eat in the morning because there is little time to prepare breakfast. Others, particularly girls, skip breakfast to lose weight.

Nutrient intake later on in the day does not compensate for skipping breakfast. Adolescents who skip breakfast tend to eat high-fat snacks. Not only is the skipping of meals a possible indicator of sub-clinical eating disorders, but the practising of such unhealthy eating habits formed early in life is likely to continue into adulthood (Simeon and Grantham 1989:646, Graham and Uphold 1992:77 and Baerheim 1994 in Shaw 1998:852).

Adolescents who omit fruit and vegetables from their diet lack nootropics (substances derived from an amino acid pyroglutamate). This can have a negative effect on learning, as well as memory consolidation and retrieval. Nootropics facilitate the flow of information between the right and left hemispheres of the brain. The right brain is associated with analytical, logical thinking and the left brain is associated with creative relational thinking (Holford 1997:151).

According to a Dr Erikson (cited by Holford 1997:152) caffeine, which is present in coffee, tea, chocolate, lucozade and cola drinks has a negative effect on concentration and the ability to remember lists of words. As we have seen in chapter two, (section 2.4.2.2) adolescents drink coffee and fizzy cold drinks, and eat chocolate. This can therefore have a negative effect on their memory, concentration and cognitive development.

3.5 PERSONALITY DEVELOPMENT DURING ADOLESCENCE

There are many theories on personality development and, because this field is so wide, it is impossible to provide an overview of all the different theories.

The following four theories are discussed: Erikson's psycho-social approach to identity formation, Bandura's social learning theory, Maslow's humanistic approach to self-fulfilment and Kelly's personal construct system in relation to eating behaviour.

These theories have been chosen because of their investigation into personality development from different perspectives. Erikson's psychosocial view on identity formation is psychoanalytical. His theory emphasises the social and the biological aspects of a person's development. Emphasis is placed on unconscious forces and internal conflicts that need to be resolved by the individual. His theory implies that adolescents must be able to solve a particular crisis successfully (for instance an identity crisis) in order to be psychologically integrated and healthy.

Bandura's social learning theory emphasises the role of the environment in shaping particular responses. The theory considers systematic patterns of environmental rewards and reinforcement. His theory is more behaviourist in nature than Erikson's view, and is centred on the role of learning in human behaviour. An exposition of his theory enables a person to consider the ways in which the environment influences personality development. An eating behaviour is learnt and can be influenced by particular environmental situations.

Maslow's humanistic approach emphasises growth and the self-actualisation of an individual. He emphasises the positive actualising aspect of human nature. This is significant since personality development during adolescence involves conscious perceptions of how the adolescent experiences himself and the surrounding world.

Kelly's personal construct theory focuses on the way that individuals organise their self-conceptions cognitively. His theory is more cognitive in nature and focuses on thought and information-processing processes. His theory is important because it emphasises a person's ability to control events. Some needs that should be met consistently are the need for food and warmth.

3.5.1 DEFINITIONS OF THE CONCEPT OF PERSONALITY

The word personality comes from the Greek work "persona" which means "theatrical mask". Some definitions of personality focus on the impact that one has on other people, while other definitions focus on the uniqueness of the person. For example, Torrey (1984:966) view personality as the traits one adopts from prevailing cultural patterns whereas Rogers (1977) cited in Mwamwenda (1995:338) views personality as being unique to every person.

Carson (1992:262) defines personality as being "the unique patterns of traits and behaviours that characterise the individual". According to Gous and Jacobs (1980:97) personality can be regarded as "a combination of personality attributes or traits like intelligence, sociability and temperament functioning as a unit".

Ausubel (1978:274) defines personality as "all the behavioural predispositions characteristic of the individual, at a given point of his life history." It embraces the more peripheral, transitory and trivial as well as the central aspects of the behavioural repertoire.

3.5.2 ERIKSON'S PSYCHO-SOCIAL APPROACH TO IDENTITY FORMATION AND EATING BEHAVIOUR DURING ADOLESCENCE

Erikson's (1963) psychosocial theory perceives the social environment as playing a major role in influencing the development of the personality. According to him, the personality develops over a period of eight stages. He emphasises the adaptive and creative aspects of human nature. The personality is seen as an organic whole, which develops from infancy to old age (McKay 1991:13).

An exposition of Erikson's eight stages of personality development is given below:

Stage 1. Basic Trust versus Mistrust (Birth to 1½ years)

This stage involves infants learning to trust people and their surroundings. Trust can be developed if infants experience their world as consistent and predictable and therefore trust will develop if they experience affection and consistency.

Stage 2. Autonomy versus Shame (1½ - 3 years)

During “toddlerhood” children learn to assert independence, to say “no” to others, to exercise autonomy and to walk where they choose. Children develop a will of their own and do what they want to do. Since toilet training begins during this period, children learn self-control over bodily functions and feelings of doubt occur when they are shamed for their behaviour.

Stage 3. Initiative versus Guilt (3-6 years)

During this stage children learn that they are capable of self-direction. They become task-oriented, can plan new activities and develop sexual curiosity. Children experience guilt when they are criticised for acts that they have initiated.

Stage 4. Industry versus Inferiority (6-12 years)

Children learn that they have the ability to acquire new skills and to test these skills. A sense of achievement is experienced when tasks are performed competently. A child who does not experience competence or who experiences repeated failure, develops feelings of inferiority.

Stage 5. Identity versus Identity Confusion (12-20 years)

Adolescents establish a sense of personal identity and decide what they are going to do with the rest of their life. This phase is elaborated on in detail in section 3.5.2.

Stage 6. Intimacy versus isolation (20-25 years)

The person develops the ability to establish relationships during this phase and relationships formed are deep and enduring. A person who does not experience a rewarding or intimate relationship feels isolated and tends to form superficial relationships.

Stage 7. Generativity versus stagnation (25-65 years)

This stage involves having a healthy relationship with the opposite sex and being an active member of society. Generativity includes having children or being productive and creative in one's activities. If a person does not experience a sense of productivity, the person stagnates in the growth process.

Stage 8. Ego Integrity versus Despair (65 years +)

During this developmental stage, a sense of integrity is achieved if a person's life has been meaningful. Despair is experienced if the person feels that his or her life has not been satisfying (Gerdes 1981: 59 and Gillis 1992:70).

According to Erikson, the outcome of each stage is dependent on the interactions between people. Each stage involves a specific conflict with two opposing characteristics. If the crisis is not resolved, a person's ability to deal with subsequent crises will be inhibited and could lead to personality maladjustment. The term "crisis" does not mean a threat but, rather, a crucial period in development that cannot be avoided. Conflict stems from physical maturation and a need to adapt to the social environment.

Stage five, identity versus identity confusion occurs during adolescence. Erikson views this stage as a search for identity and a psychological moratorium. This stage provides the adolescent with opportunities to experiment with different roles, personalities and attitudes before taking on the responsibilities of adulthood. The successful resolution of this stage enables the adolescent to develop a stable, personal identity and a sense of uniqueness.

According to Erikson (1968), the definition of an identity includes the following:

- One's public identity and the role one fulfils as a scholar, a son or a daughter. Adolescents' public identity refers to their responsibility to society by contributing their creativity and productivity to society's needs.

- A sense of one's personal identity. Personal identity refers to people experiencing themselves as the same person throughout life. Continuity gives adolescents a sense of identity.
- An individual identity is formed which includes one's perception of personal characteristics that are common to other individuals and those characteristics that make the person unique.

Erikson (1956:91) said "the younger person, in order to experience wholeness, must feel a progressive continuity between that which he has come to be during the years of childhood and that which he promises to become in the anticipated future". This implies that in order for adolescents to develop an ego identity, they need to experience a sense of continuity of self over time (Mussen 1984:508).

In a rapidly changing society, a difficult and prolonged search for identity can lead to the development of unhealthy eating behaviour. Erikson's theory reveals that the search for a person's identity is a continuous process. Eating behaviour forms part of a person's identity and a well-formed identity would include good eating habits. According to Erikson's theory, eating habits will affect the development of each stage in the life cycle.

- During the first 1½ years of a child's life, trust must be established between the parents and the infant. One of the ways that a trusting relationship can be established is by the way the parents satisfy the infant's nutrition needs. As a result of a guaranteed supply of food, children sense a link between themselves and their parents, which leads to the development of trust.
- During the stage of autonomy, children need to feel pride and success in their experiences of learning to care for themselves. For example, children who are allowed to feed themselves can gain a sense of self-confidence and self-control with regard to eating behaviour. Children who are not allowed the freedom to master the task of feeding themselves may not experience a sense of autonomy and could doubt their ability to perform tasks with regard to eating behaviour.
- During the third stage of identity development, children need to develop a sense of initiative with regard to eating behaviour. They are able to verbalise what they feel like eating and parents need to pay careful attention to their children's food preferences. Children should be praised when they ask for healthy food and should not be

encouraged to ask for sweets, fizzy cold drinks, and so on. Some children demand that their parents buy them junk food by having tantrums, and parents often give in to their children's demands to avoid embarrassment in public. This is a crucial period in the development of good or bad eating habits. If parents do not pay careful attention to their children's food choices during this stage, they could develop unhealthy eating habits, which can have a detrimental effect on their health later on in life.

- During their industrious stage, children are capable of developing new skills in the home. They could be encouraged to help with the preparation of meals. If children do not develop a positive sense of industry with regard to eating behaviour, they may experience a sense of failure. This could result in their feeling incompetent when it comes to the preparation of food and could result in their developing a reluctance to acquire skills necessary for the preparation and eating of healthy meals. Inadequate competence in this regard could have a negative effect on children's eating behaviour throughout life.
- During the identity stage, adolescents are faced with the responsibility of establishing their eating behaviour. Erikson (1968 cited in Mussen 1984:508) said "the younger person, in order to experience wholeness, must feel a progressive continuity between that which he has come to be during the years of childhood and that which he promises to become in the anticipated future". This implies that in order for adolescents to develop an ego identity, they need to experience a feeling of continuity of self over time. With regard to eating behaviour, adolescents need to experience a feeling of continuity of weight and healthy eating habits.

Since physical and physiological changes take place during this stage and have a profound effect on adolescents, they need support from significant others to help them cope with puberty and to develop healthy eating behaviour.

An adolescent's intra-psycho dialogue (the way people talk to themselves about themselves) about physical characteristics is based on the acceptance or non-acceptance of his or her body. Adolescents who cannot accept their physical appearance would say to themselves "I am too thin" or "I am too fat". If physical appearance is high on the adolescent's intra-psycho scale, weakness in this regard may overshadow other positive

dimensions. This could result in a weak physical identity and they could become prone to unhealthy eating behaviour.

3.5.3 BANDURA'S SOCIAL LEARNING THEORY OF PERSONALITY DEVELOPMENT AND EATING BEHAVIOUR

According to Bandura, the development of the personality and behaviour is determined by conditioned responses to environmental stimuli. His theory emphasises the reciprocal interaction between the social environment and the individual. Adolescents do not only learn from the reinforcement of their responses, but also through observation and imitation of others.

Bandura is of the view that learning principles account for personality development and involve the interaction of a person with others. Learning takes place when an individual observes and models the successful behaviour of another person (Hall and Lindzey 1970:463 and Gerdes 1981:59).

In a study conducted by Bandura, one group of children watched an adult model perform physical and aggressive acts toward a toy doll. Another group of children watched a non-aggressive adult who sat quietly and did not pay any attention to a toy doll. The children from both groups were mildly frustrated and placed alone in a room with the doll. The result was that the behaviour of the children was congruent with the adult model they had been exposed to. The significance of this study is that it confirms that a person can learn responses by observing others.

Attributes such as age, sex, social status and competence determine the degree to which the model will be imitated. This is significant since adolescents often model their behaviour on people in the media. Thin girls are portrayed as being attractive and are rewarded by receiving attention from others, particularly from the opposite sex. They are portrayed as having high social status as a reward for their slender physique.

Modelling is the imitation of the behaviour of others and the cognitive interpretation of consequences. By means of model emulation, adolescents imitate the attitudes and behaviour of others. This could account for unhealthy eating habits since adolescents

often emulate significant others. Some advertisements link foods with role models by displaying their photographs, for instance, on coke tins and cereal boxes. Eating behaviour messages can dominate an adolescent's choice of food, and dependent adolescents are more influenced by the behaviour of a model (Jacobson 1997:76).

The social learning theory is significant in that it helps a person to understand the way in which socially accepted behavioural patterns are acquired. The adolescent imitates the eating pattern of a parent or significant others such as a friend or a movie star. For example, an adolescent may develop the same dislike for certain foods as their parents.

Images of what society has decided is an ideal physique are depicted in fashion magazines and TV commercials. Some adverts emphasise the guilt a girl is supposed to feel when indulging in ice cream and chocolates. Boys on the other hand, are seen to have a huge appetite to match their "healthy" macho bodies (Monro 1996:15).

In a recent study, the ten most popular television programmes were monitored for a week. Food references appeared on the screen five times every half-hour. Of the foods mentioned, 85 % were fizzy cold drinks and sweets. On average, many people watch television seven hours a day. This study implies that television can have a profound influence on the snacking behaviour and the eating of junk food by adolescents (Jablow 1992:94). Adolescents often eat while watching television and, therefore, eating patterns are reinforced in this situation.

Reinforcement is a mechanism used in behaviour therapy to strengthen certain behaviour patterns and to discourage others. Behaviour that is approved of is rewarded in a variety of ways such as affection and tangible rewards. This can be related to the adolescent who is weight-conscious and diets in order to gain approval and affection from others.

Adolescents who are able to repeat appropriate healthy eating behaviour will receive optimal nutritional nourishment. By means of behavioural guidance by significant others, the adolescent can learn new responses to old situations. For example, an adolescent who eats an unbalanced diet can learn to follow a healthy diet.

Social learning theory emphasises individuals' ability to control the consequences of their behaviour. Since self-control is emphasised, it is understood that adolescents can learn to understand the causes and consequences of their eating behaviour. The theory provides educational guidelines because the enhancement of self-efficacy is an important determinant in developing healthy eating behaviour (Gerdes 1981:59, Cusatis 1995:31 and Gracey et al 1996:187).

3.5.4 MASLOW'S HUMANISTIC APPROACH OF SELF-FULFILMENT: THE IMPLICATIONS OF HIS THEORY ON PERSONALITY DEVELOPMENT AND EATING BEHAVIOUR

Maslow's approach is a dynamic view of every person as being in the process of striving toward realising his or her true potential. Autonomy, growth and self-actualisation are part of this realisation. He views the development of the personality as the process of satisfying a hierarchy of needs. According to his theory, individuals have an inherent tendency to actualise themselves (Gerdes 1981:60).

Five categories of needs are arranged hierarchically as illustrated in Figure 3.1.

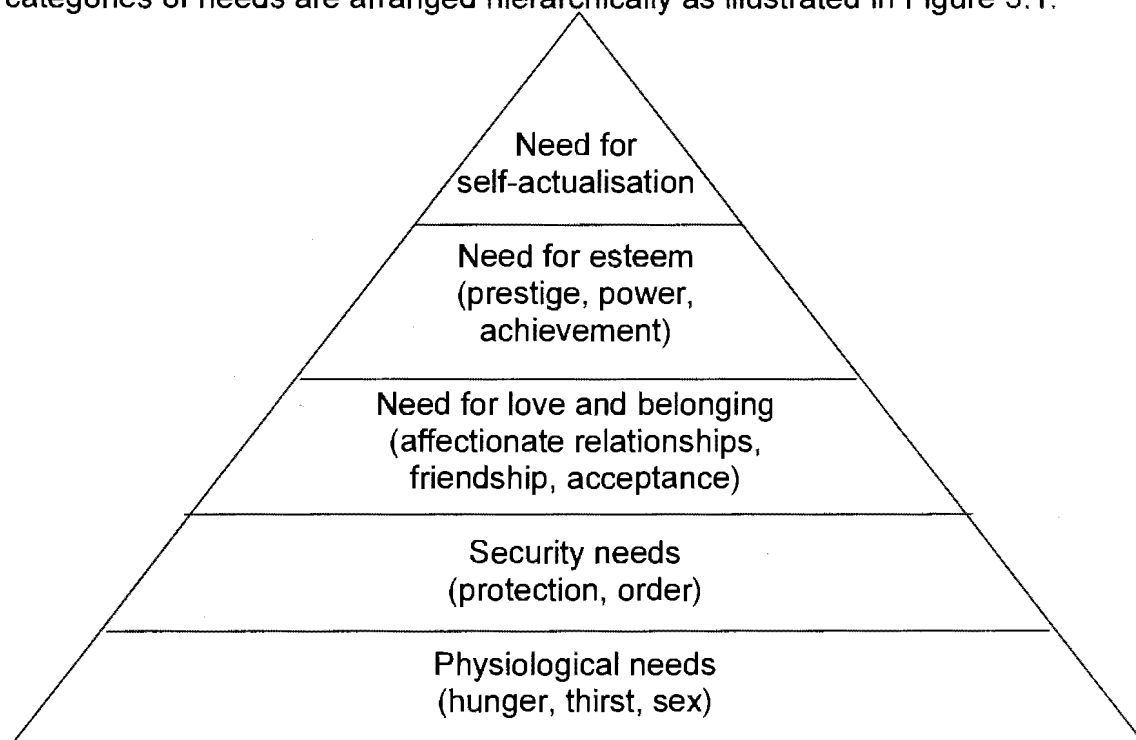


Fig. 3.1 Maslow's hierarchy of needs

The position of a person's need in the hierarchy indicates the level at which a person is functioning. Lower level needs have to be satisfied before higher level needs are achieved.

According to Davies (1991:396) survival needs "universally and nearly always elicit behaviour that over-rides all other basic needs when individuals experience physical deprivation". Maslow proposed that a person's physical needs are so powerful that even after physical deprivation has passed, unconscious memories can determine a person's eating behaviour.

In a recent study, it was found that Vietnamese concentration camp interns became compulsive overeaters when they returned home (Davies 1991:397). Higher level needs cannot be addressed until physiological demands such as hunger and thirst have been met. To satisfy physiological needs some adolescents concentrate on overeating.

Security needs are concerned with providing direct and indirect protection of oneself, one's loved ones and one's property. Some people attempt to gain a sense of security through acquiring material possessions such as land and money. Other people attempt to achieve security by perpetuating a particular socio-economic way of life. The need for security includes predictable routine, order, protection and freedom from anxiety.

Physiological security deals with external threat while psychological security deals with internal threat. Internal threats are self-generated and people tend to ask themselves "what if?" questions. Although the fears rarely come true, they cause a great amount of stress to be experienced by the individual (Poduska 1991:763). Internal threats cause certain fears, feelings of inferiority, inadequacy and feelings of being unlovable. An adolescent who experiences fear and anxiety with regard to change, can become preoccupied with lower level needs and develop unhealthy eating behaviour.

According to Davies (1991:398) love and belonging needs involve a desire to "get together, be together and stay together". People are prepared to endure occasional physical suffering more than constant isolation, meaning that love and belonging needs can override physical needs.

In a recent study Pettijohn (1996:761) found that love needs of college students were all important for their happiness. A survey was conducted in order to identify which level of Maslow's need hierarchy is perceived to make people most happy. The participants had to rank the order of four types of needs, namely, physiological needs, safety needs, love needs and the need for esteem. His survey revealed that

- more females than males put love in the first position (88% versus 64%)
- more males than females selected esteem needs in the first position (13% versus 4%)
- none of the females ranked physiological needs in the first position whereas eight % of the males did.

From these findings, one can conclude that love is an important need in Maslow's hierarchy and contributes significantly towards happiness. This research implies that adolescents need unconditional love from significant others to flourish as self-actualisers. If they do not receive unconditional love and acceptance, they could develop unhealthy eating behaviour as a defence mechanism to compensate for higher order needs that are not being fulfilled.

Esteem needs refer to people's desire to believe that they are important and worthy. They can achieve this if they are able to develop their individual talents and experience a sense of significance, self-worth and self-respect. When the satisfaction of these needs is hindered, a person experiences a feeling of inferiority and helplessness (Poduska 1991:766). According to Boskind-White and White (cited in Carson 1992:245) the psychological attributes of people with eating disorders involve low self-esteem, preoccupation with pleasing others and perfectionism. Hartley (1998:133) confirms that perfectionism and low self-esteem are recognised as predisposing personality factors in anorexia and bulimia nervosa. Adolescents who develop eating disorders tend to exercise unrealistic self-evaluation and do not accept themselves. Needs for prestige, power and achievement remain unfulfilled (Jacobs 1985:109). Dependent adolescents tend to experience personal freedoms as overwhelming, confusing and stressful. Adolescents who feel overwhelmed tend to overeat or undereat to cope with autonomy (Jablow 1992:80).

According to Maslow, self-actualisation is the highest category and includes growth needs. People rely on their own standards and abilities to reach self-actualisation. Intrinsic motivation (from within) is used to satisfy a person's needs and this level cannot be achieved if lower needs are frustrated. Self-actualisation is a person's desire for self-improvement to achieve his or her true potential (Hjelle & Ziegler 1986:373 and Gerdes 1981:62).

Difficulty in attaining self-actualisation can sometimes be attributed to society failing to offer enough opportunities for the fulfilment of growth needs. Self-actualisation can in some instances be achieved when a society acknowledges the value of the person. Society must satisfy a person's lower level needs in order that self-actualisation may occur (Aron and Aron 1987:248, Sumerlin and Bundrick 1996:254).

An adolescent who is preoccupied with satisfying physiological needs or who experiences anxiety and fear can undereat or overeat in an attempt to cope with developmental changes. When physical needs are not met, energies can be drained off, inhibiting further progress toward actualisation, causing a person to become halted at the physical need level. Likewise, an adolescent who is extremely anxious about physical changes during puberty may lose his or her appetite and undereat. In both cases the adolescent may not be able to actualise himself or herself fully.

3.5.5 KELLY'S PERSONAL CONSTRUCT THEORY AND EATING BEHAVIOUR DURING ADOLESCENCE

Kelly's theory focuses on the cognitive aspects of humankind. He views people as scientists who continually seek clarity and understanding in life. Constructs are used to interpret, predict and control events. People who experience the same events do not attribute the same meaning to them and therefore have different personal constructs (Meyer et al 1989:400 and Moller 1995:135).

Constructs are made up of two contrasting concepts and phenomena are categorised into one of the two classes, verbal or non-verbal. Non-verbal constructs refer to subjective impressions, which may be difficult to communicate. For example, an adolescent girl who interprets media information as "one has to be slender in order to be successful" could

make subjective predictions about physical appearance and success. Verbal constructs refer to objective descriptions and are easy to communicate.

Constructs are incidental or comprehensive. Incidental constructs have a limited range, whereas comprehensive constructs have a broad context:

- **Fat – thin** is a comprehensive construct since a variety of elements can be related to it.
- **Black – white** is an incidental construct since it has bearing on a single set of elements.

Behaviour becomes pathological when a person continues to use constructs that are ineffective and the person believes that his or her problems are caused by actual circumstances rather than an interpretation of the circumstances (Rychlak 1981:728; Meyer 1989:416 and Hjelle 1986:414).

According to Kelly's theory, possible causes of psychopathological behaviour are outlined as follows:

- When a person does not have the construct needed to construe a particular event, anxiety is experienced. The anxiety leads to insecurity and this results in a person feeling frightened. An adolescent who interprets the development changes that occur during puberty as threatening may feel anxious and insecure. These experiences can result in the development of defence mechanisms such as unhealthy eating habits to cope with what that person interprets as negative experiences.
- Persons who realise that they will have to change their construct can feel threatened. Adolescents who are unable to change their eating habits might feel threatened. If for example, they continue to overeat and become more overweight, they may attribute a negative meaning to puberty. They could believe that they are overweight because of changes taking place during puberty.
- It is characteristic of the compulsive person to use the same construct for every event. This can be applied to an adolescent who interprets all situations where change is experienced, as negative. The rigid manner in which the adolescent interprets all situations could result in the development of compulsive perfectionistic behaviour, as demonstrated in anorexia (Moller 1995:148-150).

The importance of the personal construct theory is that it proposes that adolescents have a choice in controlling their search for meaning and can take responsibility for their actions. This has educational implications because adolescents are capable of avoiding or modifying unhealthy eating behaviour (Gracey et al 1996:187). The ability to make decisions about eating behaviour has significance because if adolescents knew about healthy food choices they could make responsible decisions to adopt a healthy diet.

3.6 SOCIAL DEVELOPMENT DURING ADOLESCENCE

3.6.1 THE NATURE OF SOCIAL DEVELOPMENT

Social development refers to relationships established during adolescence. These relationships are characterised by independence, responsibility and a need to be accepted by others.

3.6.2 PEER RELATIONSHIPS FORMED DURING ADOLESCENCE AND THEIR INFLUENCE ON EATING BEHAVIOUR

The early adolescent, (\pm 12-14 years) experiences a need to be accepted by the group and is likely to succumb to the values of the peer group to gain approval. Relationships during mid-adolescence, (boys \pm 14-16 years, girls \pm 13-16 years) are marked by peers replacing family in a number of supportive roles. Adolescents use the peer group as a sounding board for experimentation with new ideas and behaviour. The late adolescent, (\pm 17-20 years) is less open to the influence of the peer group and relies on his or her own priorities in selecting friends (Gillis 1992:72-75).

Adolescents are ranked according to high or low status within the group. Factors that affect the ranking include intelligence, physical appearance, socio-economic status and special talents. Those adolescents who have low status among their peers tend to be more conforming than those with high status. Strong peer group influence could also result from a lack of attention and concern at home (Coleman 1980 in Mussen 1984:495 and Condry 1984:543).

The adolescent uses the standards of the peer group for self-evaluation. If being thin is a criterion for group acceptance, then adolescents resort to eating behaviour that maintains a slender physique. For example, a bulimic girl tends to believe that people will only accept her if she pleases them. She concentrates on pleasing the peer group because she does not want to disappoint them (Jablow 1992:78). Ross (1995:315) found that children eat the same food as their friends. In a recent study, attractiveness was highly valued and eating healthy food was the least valued behaviour motivator among adolescents. The most highly valued behaviour for females was to control their weight in order to look attractive (Mussen 1984:502 and Jacobson 1997:45).

Research indicates that peer influence is stronger than parental influence during adolescence and peer members can become positive or negative role models. There are those members of the group who promote energy expenditure, healthy eating and a positive body image. Other members may model high caffeine intakes, smoke as a means to control weight, and eat food that has little or no nutritional value, such as chocolates, chips and fizzy cold drinks.

3.6.3 FAMILY RELATIONSHIPS AND THE EATING BEHAVIOUR OF CHILDREN

Family relationships during mid-adolescence are characterised by the loosening of bonds between adolescents and their parents. This can be as a result of the growing need of the adolescent to attain individuality and emotional independence. Individuals in late adolescence perceive themselves as people entitled to their own opinions, capable of taking responsibility for their actions (Gillis 1992:72-75).

The attainment of independence is one of the main tasks of adolescents. Failure to resolve the conflict between continuing dependence and demands of independence leads to difficulties in other areas. As was pointed out in chapter two (section 2.5.2.2), one of the possible causes of unhealthy eating behaviour is the adolescent's struggle for autonomy. An adolescent girl who grows up in a family that exerts control over her behaviour experiences a lack of autonomy and controls her weight by undereating to exercise independence. Bachman (1970), Goldstein et al (1980), Rutter (1980) and Mussen (1984:479) all agree that parents play an important role in determining an adolescent's sense of autonomy.

Mussen (1984:481) outlines the following types of parenting styles:

- Autocratic parenting style: Parents tell the child what to do.
- Authoritarian parenting: The adolescent can participate but does not play a role in decision making.
- Democratic parenting: The adolescent contributes freely to issues that are relevant to his or her behaviour and plays a role in making decisions, but the parents hold the ultimate authority.
- Egalitarian parenting: There is no role differentiation between the parent and the child.
- Permissive parenting: Decision making is done by the adolescent.
- Laissez-faire parenting: The adolescent is free to listen to or disregard the parents' wishes.

A democratic parenting style can result in an adolescent who is self-confident and independent. Democratic parents value autonomy, encourage verbal discussions and when they exercise their authority they explain their reasons for doing so (Bachman 1970 in Mussen 1984:482). Since adolescents contribute freely to issues that are relevant to their behaviour, they would be able to make decisions about their eating behaviour. Although adolescents are encouraged to choose their own eating behaviour, their parents hold the ultimate authority. This means that if adolescents adopt unhealthy eating habits, their parents would be able to advise them on how to develop healthy eating habits.

Autocratic and authoritarian parenting results in adolescents viewing their parents as unaffectionate, rejecting and unreasonable. Autocratic parents may dictate what adolescents may or may not eat. This could result in adolescents eating junk food in secret. It could also result in adolescents' inability to make healthy food choices in the absence of their parents. Furthermore, when parents do not show confidence in their children's ability to make decisions, the children could become resentful and purposefully develop unhealthy eating habits.

Egalitarian, permissive and laissez-faire parenting styles cause adolescents to feel insecure. Adolescents believe that they do not have dependable role models of behaviour and feel neglected by their parents. These parenting styles could result in adolescents

developing unhealthy eating habits because decisions about eating behaviour are determined by the child.

Humphrey (1989:206-214) found adolescents' struggle for independence to be the underlying psychodynamics of unhealthy eating behaviour. This is further verified by Scalf-Mclver and Thompson (1989:467-472) who found that adolescents with eating disorders are involved in power struggles concerning autonomy and identity. Autonomy refers to the need to experience one's choices, thoughts, and actions freely (Anderson in Snodgrass 1997:233). Because parents play a role in the development of their child's autonomy, it is important that they allow children the freedom to play a role in making decisions about their eating behaviour. An effective adolescent-to-parent relationship is therefore a very important factor in adolescents' eating behaviour.

Adolescents experience a variety of emotions in the process of becoming independent people. There are times when they resent their parents' intrusion into their life-world and there are times when they want to receive love, to be accepted and feel secure.

Eating disorders may be found in middle or upper socio-economic classes. In these homes there may be an abundance of food but emotional tension tends to exist because parents are rushed and anxious in maintaining their lifestyles. Adolescents may therefore be expected to take on responsibilities such as preparation of meals, house cleaning and looking after siblings. Some adolescents resent having to take on these responsibilities and may develop unhealthy eating behaviour in an attempt to cope with the emotional stress they experience.

The increasing number of working parents has resulted in adolescents who do the food shopping for the family. A recent survey revealed that 90 % of adolescents shop for their families (McCullum and Achterberg 1997:181). Many adolescents do not have sufficient knowledge about nutrition and their food-purchasing habits may have an effect on their eating behaviour. Taste, texture and price were found to be the most important factors in food selection among adolescents. Male adolescents were found to be attracted to the appearance and size of the package and showed no concern for the food label.

When psychological needs are not met, food can become a central focus in a person's life. To some adolescents, food is associated with a parent's love when they prepare the child's favourite dish. A food-centred family could encourage an adolescent to develop unhealthy eating habits because they associate food with entertainment, celebrations and joyful events.

Foods such as fizzy cold drinks, chips and ice cream can be associated with comfort because parents often give their children junk food when they are physically hurt or emotionally sad. As a result, adolescents who experience physical and emotional problems eat junk food in an attempt to comfort themselves. For example, bulimics binge on junk food to comfort their emotional needs (Jablow 1992:25).

In some families, parents are concerned about dieting for health reasons. For example, a father may be on diet because his cholesterol count is too high. In this case, the male adolescent may be influenced by his father's diet. On one hand this could have a positive influence on the adolescent's health because he will also attempt to control his weight. On the other hand adolescents need certain nutritional requirements for growth and development, which the father may omit from his diet. Furthermore, adolescents might over-exercise and undereat in order to avoid a high cholesterol count.

A familial tendency to diet was verified in research done by Brook (1997:287), who found that among adolescents who diet, 67 % of mothers and 44 % of fathers were found to have dieted. This proves that adolescents are influenced by the eating behaviour of their parents and dieting can have a negative effect on a person's health (see section 2.4.3).

According to Jablow (1992:68) the following characteristics in a family environment can lead to the development of unhealthy eating behaviour:

- Enmeshment: This refers to a form of closeness and intensity in family relationships. The members of enmeshed families are very entwined and individuality is smothered. Adolescents of enmeshed families could develop unhealthy eating behaviour because they are not allowed to choose their preferred choice of food. If, for example, the family members follow a high protein diet such as eating a lot of meat, adolescents tend to follow the same diet.

- Overprotection: In this family, the child is not encouraged to take risks outside of the family's safety net and this stifles the adolescent's autonomy. Children who are overprotected may not be able to make healthy food choices when they are away from their family because they believe that only family members are capable of making healthy food choices for them.
- Rigidity: These families are resistant and vulnerable to events that bring about change. Examples include relocation, loss of a relative, separation and divorce. They view change as threatening and develop rigid patterns to maintain their status quo. If they follow an unhealthy diet they will find it difficult to change their diet. As a result of their rigidity, they will not be open to new information about healthy eating behaviour.
- Conflict avoidance: Conflict is experienced as threatening in these families and they avoid bringing conflict out into the open. The goal to maintain family harmony is all-important. Disagreements are dealt with by being postponed, side tracked or defused. Because conflict is not resolved it is possible that members may turn to food as a means to cope with tension.

Families of anorexics and bulimics tend to be less trusting, chaotic, and lack good conflict resolution skills. A chaotic home environment refers to one that is unpredictable. Examples include the adolescent's uncertainty as to who will prepare the meal, uncertainty as to whether or not the parents will be coming home and uncertainty as to whether or not the parents might be fighting when they get home. Conflict is usually not well managed since these families express great anger or use indirect patterns of communication. Anorexics usually describe their mothers as dominant, overbearing and ambivalent. Adolescents who live in an environment of ambiguity and chaos can resort to dieting as a means of exercising self-control (Jablow 1992:28, Carson 1992:243 and Monro 1996:83).

Family relationships and the eating habits of parents can be associated with the eating habits of adolescents. Parents determine the availability of food, eating-out opportunities and influence how often snack meals are consumed (Jacobson 1997:75). Since parents have an influence on the eating behaviour of their children it would therefore seem necessary that parents establish positive relationships with their children. Parents need to inform their children about the changes that normally occur during adolescence and to

educate them about the consequences of dieting and overeating and to encourage their children to develop healthy long-term eating habits.

3.7 EMOTIONAL DEVELOPMENT DURING ADOLESCENCE AND THE EFFECT OF EMOTIONS ON EATING BEHAVIOUR

Adolescence is characterised by mood swings, which involve emotions that can change rapidly from one moment to the next. Mood swings can be linked with changing levels of hormones. The following factors play a role in affecting emotions during adolescence:

- Physiological changes (hormonal): Physical and physiological changes take place and adolescents find it difficult to adjust to their development.
- Peer group: Adolescents need to be accepted by the peer group and avoid being alone.
- Family: Adolescents tend to question family values and conflict related to independence arises.
- Society: Adolescents experience difficulty in selecting an appropriate career and life style.
- Self-perception: Self-perception and perception of others can result in conflict.
- Relationships: Adolescents experience difficulties in forming meaningful heterosexual relationships (PPASA 1998:31).

These factors result in common feelings experienced by adolescents namely:

- Feelings of inferiority: When adolescents compare their physical development with other significant role models, feelings of inferiority can be experienced.
- Feelings of anger: Poor achievement, marital and financial difficulties at home, can result in feelings of anger.
- Feelings of rejection: If they are not accepted by the peer group, feelings of rejection can be experienced. Failure to meet the expectations of others or divorce in the family can lead to further feelings of rejection.
- Feelings of embarrassment: These feelings are related to the family's wealth and profession (Johnson 1987:670).

Feelings of inferiority, anger, rejection and embarrassment can result in unhealthy eating behaviour, which is how adolescents attempt to cope with emotions that they are unable to deal with in any other way.

Feelings of inferiority and embarrassment are often experienced when adolescents compare their physique to their peers, and this can result in unhealthy eating behaviour. For example, a boy whose muscle growth and motor development is below the level of his peers could overeat in an attempt to build muscle tissue.

Feelings of anger can be experienced when an adolescent is teased or criticised and can result in unhealthy eating behaviour. If for example, an adolescent girl is teased about her physical disproportion, characteristic of growth, she may undereat in an attempt to look more proportional.

Feelings of rejection are often experienced by adolescents who are unable to accomplish the expectations of others, and can result in unhealthy eating behaviour. For example, adolescents who strive to achieve good grades and who are unable to do so may feel that they have failed their parents, teachers, friends and can resort to overeating in an attempt to comfort themselves.

Adolescent emotionality can occur as a result of a lack of preparation to meet the changed conditions that face them during adolescence.

The effects of eating disorders on the emotions of adolescents need to be considered. Dieting, which may lead to anorexia, has the following psychological and emotional effects on adolescents:

- The adolescent girl becomes stubborn and arrogant when she argues about the amount of food she did or did not eat.
- When an adolescent controls her diet, a sense of euphoria is experienced.
- By establishing rigid weight rules, a sense of security is gained.
- A fear of giving in to the temptation of overeating is experienced.
- Depression is experienced as a result of malnutrition as well as a fear of losing control over eating behaviour (Jablow 1992:52).

People who overeat are said to be trying to fulfil hungers of emotions such as regret, sorrow, unspoken anger and unrealised dreams.

Overeating can lead to obesity, which negatively influences the emotional wellbeing of adolescents in the following ways:

- Many people see overeating as a sign of moral weakness and bias is usually shown toward obese people. Obese adolescents do not receive good letters of recommendation from others, which hampers their chances of employment or acceptance into tertiary education. This may result in feelings of rejection and adolescents may overeat to comfort themselves.
- An overweight person tends to feel inferior in an environment that places high value on being slender. They avoid physical activities because they experience them as being difficult, frustrating and embarrassing.
- Self-esteem is lowered even further when the overweight adolescent shops for clothes, which do not fit. When self-esteem is lowered, adolescents may experience feelings of frustration and usually turn to chocolates, ice cream and so on to cope with these feelings.
- A feeling of failure is experienced because they compare themselves to their peers. An overweight person focuses on body size and believes that life would improve if he or she could lose weight.

The following nutritional deficiencies, eating disorders and emotions are outlined in Hartley (1998:137):

Nutrient	Cause of Deficiency	Deficiency	Food sources
Vitamin B 12	<ul style="list-style-type: none"> • poor diet • vegetarianism 	<ul style="list-style-type: none"> • anaemia • depression 	<ul style="list-style-type: none"> • animal products
Vitamin B 6	<ul style="list-style-type: none"> • poor diet 	<ul style="list-style-type: none"> • depression 	<ul style="list-style-type: none"> • chicken, fish, pork, eggs, brown rice, oats, whole wheat, peanuts.
Thiamine	<ul style="list-style-type: none"> • poor diet 	<ul style="list-style-type: none"> • irritability • aggression 	<ul style="list-style-type: none"> • whole grain cereals, pork, seeds and nuts.

Table 3.1 Nutritional deficiencies and emotions

Nutrient	Cause of Deficiency	Deficiency	Food sources
Riboflavin	<ul style="list-style-type: none"> • poor diet 	<ul style="list-style-type: none"> • depression • mood disorders 	<ul style="list-style-type: none"> • poultry, fish, broccoli, asparagus, spinach
Folic acid	<ul style="list-style-type: none"> • poor diet 	<ul style="list-style-type: none"> • depression • anxiety 	<ul style="list-style-type: none"> • peppers, broccoli, spinach, tomatoes, potatoes, strawberries, citrus fruit
Selenium	<ul style="list-style-type: none"> • poor diet • vegetarianism 	<ul style="list-style-type: none"> • depression • anxiety • mood changes 	<ul style="list-style-type: none"> • shell fish, meat, pasta, breads

Table 3.1 Nutritional deficiencies and emotions (contd.)

The table indicates that emotional symptoms develop when one omits certain nutrients from the diet.

Some of the emotions experienced by adolescents include anxiety and stress. Anxiety is a feeling of being insecure, incapable of meeting the demands of a situation and feeling the anticipation of a negative outcome.

According to Epanchin (1987:166) stress becomes problematic when “the environment contains excessive stressors or when the environment exceeds the individual’s ability to respond successfully.” Many adolescents claim that stress affects their appetite. Stress signals increase the production of brain neurotransmitters, for example, norepinephrine and dopamine, which increase one’s appetite. Some adolescents, however, eat less when experiencing stress. The hormone glucagon suppresses a person’s appetite (Pawlak 1995:25). Since stress affects appetite, adolescents who experience stress might deprive themselves nutritionally.

It is interesting to note that the foods that a bulimic denies herself or himself (saturated fats and highly refined carbohydrates) usually become the content of the binge. These foods are associated with “comforting” foods because of their serotonin link. The effect of serotonin brings about calmness (Hartley 1998:133).

Although anxiety and stress are part of everyday life, unmanageable anxiety and stress can overwhelm adolescents. The inability to cope with anxiety and stress can result in maladaptive coping skills such as unhealthy eating behaviour, which could develop further into eating disorders.

3.8 CONCLUSION

The literature study in this chapter indicates that adolescence is a period of physical, cognitive, personality, social and emotional development.

Unhealthy eating behaviour is found to have a negative effect on physical and physiological development. The literature study reveals that an unhealthy diet can inhibit the process of growth and can result in physiological imbalances.

It is apparent that unhealthy eating behaviour can have a detrimental effect on cognitive development. The literature study reveals that the brain continues to develop during adolescence and unhealthy nutrition has a negative effect on achievement levels as well as on a person's ability to concentrate.

It was found that during personality development, adolescents search for and consolidate their identity. An eating habit becomes part of a person's identity and therefore it is important that healthy eating habits are adopted during adolescence.

It is further apparent that family and peer relationships influence the eating behaviour of adolescents. The literature study reveals that parents play an important role in determining the type of eating behaviour adopted by their children.

The literature study indicates that adolescents experience many emotions as they relate to parents, peers, teachers and society. Aggressive and inhibitory emotions are found to

have a negative effect on the eating behaviour of adolescents. It is also evident that emotional symptoms develop when people omit certain nutrients from their diet.

In the following chapter, an empirical investigation into the eating habits of adolescents is discussed.

CHAPTER 4

THE METHOD OF THE EMPIRICAL INVESTIGATION

4.1 INTRODUCTION

This chapter looks at the research design used to investigate the eating habits of adolescents and their relationship to other variables identified in the literature study.

Certain hypotheses are formulated with reference to these variables and eating behaviour. The research plan used to test these hypotheses are described briefly, including the selection of the sample, a description of the measuring instruments used, the procedure used in formulating and administering the questionnaire and, finally, the methods used in analysing the data.

4.2 HYPOTHESES

The following hypotheses were formulated after studying the relevant literature:

4.2.1 HYPOTHESIS 1

There is a significant difference between boys and girls with regard to eating habits.

Rationale

From the literature study it was evident that differences exist between the eating behaviour of boys and girls (refer sections 2.3.2.2, 3.3.2, and 3.5.3). Anderson (1984:901); Yager (1984:427); Williams (1989:357) and Monro (1996:69) found that girls tend to eat less in order to be thin and that boys eat more in order to achieve a masculine appearance. It was also found that girls tend to have more endomorphic physiques than boys do. This means that girls are more predisposed toward becoming overweight (Hall 1970:367). Nichter (1994:109) found that girls believe that they must be thin in order to be popular with boys. Girls experience more stress during puberty due to physical and physiological changes and are at a greater risk of developing unhealthy eating behaviour (Merlo 1993:25; Apfelbaum 1993:433 and Keel 1996:213). It would seem that gender might therefore be a factor that affects eating behaviour.

4.2.2 HYPOTHESIS 2

There is a significant difference between the average eating habits of adolescents who participate in sport and adolescents who do not participate in sport.

Rationale

According to the literature study (refer sections 2.5.4.1 and 3.7), adolescents do not participate in enough physical activities. Ferrairi (1993:331) found that adolescents with unhealthy eating habits do not participate in sport. Instead they watch television or play computer games for more than three hours a day. It was also found that overweight adolescents avoid participating in sport because they experience sport as difficult, frustrating and embarrassing (Jablow 1992:97).

4.2.3 HYPOTHESIS 3

The relationship between adolescents and their parents and how it may affect eating habits is covered by the following two hypotheses:

HYPOTHESIS 3a

There is a significant difference in the average eating habits of adolescents who have a good relationship with their mother and adolescents who do not have a good relationship with their mother.

HYPOTHESIS 3b

There is a significant difference in the average eating habits of adolescents who have a good relationship with their father and adolescents who do not have a good relationship with their father.

Rationale

The literature study revealed that the type of relationship between parents and their children influences the eating behaviour of adolescents (refer sections 2.4.4.4, 2.5.1, 2.5.4.1, 3.3.4 and 3.6.3) Scalf-Mclver (1989:467); Bruch (1980:14); Boskind-White (1986) in Carson (1992:245) all found that adolescents who engage in unhealthy eating behaviour are involved in a power struggle with their parents for autonomy and identity.

Anorexics describe their mothers as being excessively dominant and intrusive (Humphrey 1989:206, Rhodes 1992:249 and Frank 1996:55). It was also found that an atmosphere of tension and hostility in the home leads to unhealthy eating habits (Claude-Pierre 1998:78). Autocratic, equalitarian, permissive and laissez-faire parenting styles can have a negative effect on the eating behaviour of adolescents (Mussen 1984:479 and Snodgrass 1997:233). It would therefore seem that particular relationships with their parents might affect the eating behaviour of adolescents.

4.2.4 HYPOTHESIS 4

Knowledge of nutrition and how it affects eating habits are divided into the following two hypotheses:

HYPOTHESIS 4a

There is a significant difference between the average eating habits of adolescents who have knowledge of the health risks of obesity and adolescents who do not have knowledge of the health risks of obesity.

HYPOTHESIS 4b

There is a significant difference between the average eating habits of adolescents who have knowledge of the dangers of excessive dieting and adolescents who do not have knowledge of the health risks of excessive dieting.

Rationale

According to the literature study (refer sections 2.4.2.2, 2.5.4.1, 3.5.4. and 3.6.3.), knowledge of nutrition has an influence on eating behaviour. Brook (1997:283) and Ahmad (1997:489) found that adolescents have insufficient knowledge of nutrition. It was also found that adolescents tend to choose food on the basis of taste, texture, appearance and smell rather than nutritional value (Neil 1994:151; Ross 1995:315; Schumaker 1997:275 and McCullum 1997:181). Clark (1990:68) and Ferrairi (1993:331) found that overweight adolescents eat high calorie diets with excessive protein as well as fat, and tend to be unaware of the dangers of obesity. Specific research regarding adolescents'

knowledge of the health risks of obesity and knowledge of the dangers of excessive dieting could not be found.

4.2.5 HYPOTHESIS 5

There is a significant difference between the average intelligence of adolescents with good eating habits and adolescents with bad eating habits.

Rationale

The literature study (refer sections 2.3.2.1 and 3.4.4) revealed that the research conducted on the relationship between intelligence and unhealthy eating behaviour yields that eating behaviour has an effect on Intelligence and visa versa. Simeon (1989:646) and Holford (1997:151) found that skipping breakfast, omitting fruit and vegetables from one's diet, and the consumption of caffeine found in most junk foods, all have a negative effect on memory consolidation and retrieval. Undernourished adolescents tend to have little energy and find it hard to concentrate, and this can limit their cognitive abilities (Ross 1995:9 and Walker 1998:109). Canals (1996:448) found that adolescents with low intelligence are at risk of developing unhealthy eating behaviour while Sanders (1995:11) found that adolescents with high intelligence are at risk of developing unhealthy eating behaviour.

4.2.6 HYPOTHESIS 6

There is a significant difference between the average eating habits of adolescents with a different birth order in the family.

No research could be found regarding eating habits in relation to the order of the child in the family. However, my observation reveals that the eating habits of children in the same family tend to differ. This could possibly be influenced by the child's position in the family, for instance, whether he or she is the youngest, eldest, middle or only child.

4.2.7 HYPOTHESIS 7

The physical appearance of parents and its effect on adolescent eating habits is covered by the following two hypotheses:

HYPOTHESIS 7a

There is a significant difference between the average eating habits of adolescents with parents of different physical appearances. (such as mothers who are thin, overweight or of normal weight).

HYPOTHESIS 7b

There is a significant difference between the average eating habits of adolescents with parents of different physical appearances. (such as fathers who are thin, overweight or of normal weight).

Rationale

The literature study (refer to sections 2.4.4.4, 2.5.4.1, 3.3.4 and 3.6.3), revealed that the eating behaviour adopted by parents influences the eating behaviour of their children. By adopting the same eating behaviour as their parents or one of their parents, adolescents tend to develop a similar physical appearance. Jablow (1992:99) found that if both parents are overweight, the adolescent has a 70% to 80% chance of being overweight. Bruch (1980:330) found that overweight adolescents copy the eating behaviour of parents who respond to distress by eating. Brook (1997:287) also found that adolescents who engage in dieting have parents who diet. Many parents do not eat fruit and vegetables and, therefore, do not provide them for adolescents. A lack of fruit and vegetables could result in a shortage of the recommended daily intake of vitamins and minerals (Neil 1994:151 and Nicklas et al 1997:315). Some parents are too busy to prepare balanced meals, and use instant foods or buy take-aways from fast food outlets (Humphrey 1989:208; Valentini 1997:14 and Claude-Pierre 1998:79). Parents determine what kind of food is eaten by their children (Neil 1994:151, Brook 1997:283 and Jacobson 1997:75). Whitney (1984:238) found that food-centred families promote unhealthy eating habits.

4.2.8 HYPOTHESIS 8

There is a significant difference between certain emotions of adolescents with good eating habits and adolescents with bad eating habits.

Rationale

According to the literature study, certain emotions experienced during adolescence can have a negative effect on eating behaviour (refer sections 2.4.4.5, 2.5.4.1, 2.5.3.2, 3.3.2, 3.4.4, 3.5.3, 3.5.4 and 3.7). Robinson (1982:221); Roth (1982:93); Epanchin (1987:179); Williams (1989:508) and Jablow (1992:80) found that during adolescence, females experience anxiety due to pubertal changes and tend to impose caloric restrictions in their diet. It was also found that adolescents eat junk food in response to anxiety and to relieve emotional tension (Garner 1985:255, Cooper 1985:129, Johnson 1987:673 and Carson 1992:245). The literature study reveals that adolescents tend to overeat in an attempt to relieve feelings of depression. Vrey (1979:180) found that feelings of depression are experienced during adolescence because there is a discrepancy between the actual and the ideal body image. Hartley (1998:137) found that depression is caused by certain vitamin and mineral deficiencies. Very few studies have been conducted in order to confirm the link between depression and eating behaviour. Research could not be traced on the effect of specific emotions on eating habits, for example distrust, feelings of helplessness (“dyscontrol”) and aggression.

4.2.9 HYPOTHESIS 9

There is a significant difference between the average self-concept of adolescents with good eating habits and adolescents with bad eating habits.

Rationale

According to the literature study (refer to paragraphs 2.5.4.1, 3.4.4, 3.5.2 and 3.6.3) it was found that the type of self-concept an adolescent develops affects his or her eating habits. Bruch (1980:330); Mussen (1984:551) and Gillis (1992:80) found that adolescents with unrealistically low self-concepts develop unhealthy eating habits. Erickson (1968) found that when a disparity exists between an ideal and a real body image, adolescents develop a low self-concept. Adolescents intend to use escape mechanisms such as unhealthy eating behaviour to deal with the disparity between the ideal and the real body image. From the available research one can conclude that there is a relationship between the self-concept and eating behaviour. From the literature study it has become evident that eating behaviour can be influenced by one’s self-concept relating to one’s body image

(refer paragraphs 2.5.1, 3.3.2 and 3.5.2). Ferrairi (1993:329); Gerdes (1981:66); Jacobs and Vrey (1982) in Raath (1985:93) all found that a negative body image can be associated with unhealthy eating behaviour. The research evidence reveals that a negative body image tends to overshadow other positive dimensions and can result in unhealthy eating behaviour.

4.2.10 HYPOTHESIS 10

There is a significant difference between certain personality traits of adolescents with good eating habits and adolescents with bad eating habits.

The literature study reveals that the personality type of an adolescent can influence his or her eating behaviour (see sections 3.3.3, 3.5.2, 3.5.4 and 3.6.3). Sheldon (1944:543) found that people with personality types that tend toward viscerotonia tend to love comfort, are gluttons for food, need sociability and affection. Erikson cited in Mussen (1984:512) found that approval-oriented adolescents tend to be less autonomous than their peers. Boskind-White, cited in Carson (1992:245), and Hartley (1998:133) verified these findings and confirmed that adolescents with unhealthy eating behaviour tend to be preoccupied with pleasing others and tend to perfectionism.

4.3 SELECTION OF THE SAMPLE

Two schools were selected at random, one in Nelspruit and one in White River. The school in Nelspruit is a government school and enrolls pupils from various socio-economic environments. The school in White River is a private college, which enrolls pupils from a higher socio-economic environment. Pupils were randomly selected from class registers.

The final sample consisted of 340 pupils, 162 boys and 178 girls. The number of boys and girls in each grade is outlined in table 4.1.

Table 4.1 . The number of boys and girls in Grades 8 – 12.

GRADE	NO. BOYS	NO. GIRLS	TOTAL
8	33	35	68
9	30	37	67
10	32	33	65
11	33	36	69
12	34	37	71

4.4 MEASURING INSTRUMENTS USED IN THE INVESTIGATION

A summary of the variables measured and the measuring instruments used to measure these variables is provided in table 4.1. A detailed description of each of the instruments used follows the table.

Table 4.2 Variables measured and the measuring instruments

VARIABLES	MEASURING INSTRUMENTS
1. Eating Habits	EHQA – Eating Habits Questionnaire for Adolescents (Newly developed)
2. Intellectual Ability	GSAT – General Scholastic Aptitude Test NSAGT – New South African Group Test
3. Emotions	EPI – Emotions Profile Index
4. Self-concept	ASCS – Adolescent Self-concept Scale
5. Personality type	HSPQ – High School Personality Questionnaire

4.4.1 THE DEVELOPMENT OF A MEASURING INSTRUMENT USED TO MEASURE THE EATING HABITS OF ADOLESCENTS

Few studies have investigated the link between eating habits and variables such as gender, participation in sport, relationship with parents, knowledge of nutrition, intellectual

ability, order of the child in the family, physical appearance of parents, emotions, self-concept and personality type.

The Eating Attitudes Test (EAT – 26) and the Eating Behaviour Test (EBT) measure symptoms characteristic of eating disorders. It was therefore decided to develop a questionnaire that would measure the variables mentioned above against the eating habits of adolescents.

4.4.1.1 THE STRUCTURE OF THE MEASURING INSTRUMENT

(i) Initial Considerations

When an attempt is made to assess a pupil's eating habits, certain considerations ought to be taken into account when constructing the measuring instrument.

Firstly, the instrument should not be too time-consuming to administer. It would probably be used in conjunction with other tests and, therefore, the questionnaire should not be too lengthy.

Secondly, the instrument should be flexible. It should be possible to use it in an individual or group test situation.

A questionnaire that makes use of a scale would be an appropriate instrument. This facilitates administration and interpretation and means it can be used in a group situation.

(ii) Format of the Questionnaire

The constructed questionnaire has the following characteristics:

- It consists of two sections: Section A and Section B. Biographical information is obtained in Section A and consists of 28 items. Factors such as participation in sport, relationship with parents, knowledge of nutrition, birth order and physical appearance of

parents are also measured. Section B measures a person's eating habits and consists of 86 items.

- In section B, seven dimensions of eating habits were identified for analysis in the literature study. It was decided that for the purpose of this investigation, certain dimensions could be grouped together to form four major dimensions. They were:
 - (i) external factors (the influence of parents, friends and the media)
 - (ii) emotional aspects
 - (iii) knowledge of nutrition
 - (iv) behaviour (types of eating behaviour and physical exercise).

- Each item has a positive and a negative pole with a scale of 1 to 4 ranging in-between. A 4-point scale of 4 was chosen because this enables the pupil to choose a middle-of-the-road option. A code number was placed in the block next to each statement. The following numbers and codes were used:
 - 1 = ALWAYS
 - 2 = USUALLY (OFTEN)
 - 3 = RARELY (HARDLY EVER)
 - 4 = NEVER

- The higher the score for the questionnaire as a whole, the poorer the eating habits.

4.4.1.2 THE DEVELOPMENT OF ITEMS FOR THE MEASURING INSTRUMENT

Other instruments used by researchers in the past to measure aspects of eating behaviour, were consulted.

Garner's "Eating Attitudes Test" (EAT-26) scale (1982) measures symptoms and concerns characteristic of eating disorders. Certain items in the questionnaire were adapted from the EAT-26.

A few of the items in the questionnaire were adapted from the "Eating Behaviour Test" (EBT-16). The questionnaire is a self-assessment test used to measure behaviours and feelings that are common in people suffering from an eating disorder.

As stated in section 4.4.1, previous research into the eating habits of adolescents has not yielded an instrument that measures adolescent eating habits. The newly developed instrument contains items that reflect features that are typical of the eating behaviour of adolescents. As already mentioned, it consists of two sections.

Section A: Biographical Information

The items in this section attempt to provide biographical information with regard to

- physical profile – height and weight
- gender
- physical appearance of parents
- race
- religion
- age
- health status

Section B: Eating Habits

(i) Dimension 1: External Factors

The items in this section attempt to answer the following questions:

- To what extent do the adolescent's parents influence his or her eating behaviour?
- To what extent do the adolescent's friends influence his eating behaviour?

- To what extent do the media influence an adolescent's eating behaviour?

Examples of these items include:

Item number 1. When you eat out with your parents, how often are you free to choose which meal you want to order?

Item number 10. How often do you feel obliged to eat crisps, sweets, biscuits, etc, offered to you by your friends?

Item number 15. How often do you raid the kitchen for something to nibble on when food is advertised on television?

(ii) Dimension 2: Emotional Aspects

The items in this section attempt to evaluate the influence of a person's emotions on eating behaviour.

An example of one of these items is

Item number 11. How often do you binge on food when you have negative feelings such as anger, frustration, or sadness?

(iii) Dimension 3: Knowledge of Nutrition

The items in this section attempt to measure the person's knowledge of nutrition and a balanced diet.

An example of one of these items is

Item number 47. How often do you know which vitamins are found in the food that you eat?

(iv) Dimension 4: Behaviour

The items in this section attempt to measure the adolescent's eating behaviour and participation in physical exercise.

Examples of questions include

Item number 6. How often do you avoid participating in physical activities?

Item number 9. How often do you eat diet foods?

Item number 51. How often do you skip breakfast?

A distribution of the items in the various dimensions used in section B of the questionnaire appears in table 4.3

Table 4.3 Distribution of the items in the various dimensions used in section B of the questionnaire.

DIMENSION	ITEM NUMBERS
External Factors	
• Parents	1, 3, 5, 7, 58, 72, 74, 79, 80, 86
• Friends	10, 12, 20, 27, 52
• Media	13, 15, 17, 22, 24, 26, 66
Emotional aspects	11, 14, 16, 18, 19, 21, 23, 25, 31, 34, 36, 38, 40, 75, 76, 77, 81, 83, 84
Knowledge of nutrition	28, 30, 32, 35, 37, 39, 41, 43, 45, 47, 49, 53, 55, 57, 60
Behaviour	
• Types of eating behaviour	2, 8, 9, 25, 29, 33, 42, 44, 46, 48, 50, 51, 54, 56, 59, 63, 65, 68, 70, 78, 82, 85
• Physical exercise	4, 6, 62, 64, 67, 69, 71

4.4.2 THE MEASUREMENT OF INTELLECTUAL ABILITY

The intelligence quotients (IQ) of the pupils were obtained from their Ed-Lab (permanent cumulative record) cards. These IQ scores were obtained by means of a group test, either the GSAT (General Scholastic Aptitude Test) or the NSAGT (New South African Group Test). The tests were carried out during the primary school phase, Grades 6 or 7.

4.4.2.1 GENERAL SCHOLASTIC APTITUDE TEST (GSAT)

The GSAT is a group test constructed to measure academic intelligence or scholastic ability. It consists of seven sub-tests, which determine pupils' problem-solving and reasoning ability. There are two alternative forms of the test – Forms A and B. The Scholastic Aptitude Score (SA) has a normalised standard scale with a mean of 100 and a standard deviation of 15. There is also a normalised stanine scale. It provides standard scores from 1 to 9 with a mean of 5 and a standard deviation of 1,96.

4.4.2.1.1 RELIABILITY OF THE GSAT

The reliability of the GSAT was determined using the following methods:

- Test-Retest Reliability: The reliability coefficient for Form A was 0.94 and for Form B it was 0,96.
- Alternate Form Reliability: The reliability coefficient when Form A was administered was 0.91 and when Form B was administered, the reliability coefficient was 0.93.
- Standard Error of Measurement: The standard error of measurement for the different age groups ranged from 2,64 to 2,85. It is used to estimate the probable boundaries within the true score of a person who obtained a particular score. For example, if a person has a SA score of 107, and the standard error of measurement was 2,64, then one can be 95% sure that the true score lies between 102 and 112.

4.4.2.1.2 VALIDITY OF THE GSAT

The validity of the GSAT was determined by finding the inter-correlations of the sub-tests and correlations with other intelligence tests. Although the content of the GSAT sub-tests differed, the aim of each test was to determine the testee's problem-solving ability. All sub-tests were strongly correlated with one another. The correlations varied from 0,661 to 0,813. High correlations with other intelligence tests can be seen as proof of the GSAT's construct validity.

4.4.2.2 NEW SOUTH AFRICAN GROUP TEST (NSAGT)

The NSAGT was designed as a group test for academic intelligence. The aim was to provide a verbal, non-verbal and a total IQ score for each testee. The assumption is made that the ability to solve problems involving figures, verbal material and numbers is an important indicator of intelligence. As with the GSAT, the NSAGT has a normalised standard scale with a mean of 100 and a standard deviation of 15.

4.4.2.2.1 RELIABILITY OF THE NSAGT

The reliability coefficients (Kuder-Richardson Formula 20) were calculated for consecutive six-month-interval age groups in the norm samples. The reliabilities for the non-verbal, verbal and total IQ scores were higher than 0,78, 0,70 and 0,84 respectively.

4.4.2.2.2 VALIDITY OF THE NSAGT

Predictive validity of the NSAGT was determined by correlating the test scores with scores obtained in language and proficiency tests for the norm sample. The correlation coefficients ranged from 0,71 to 0,86.

4.4.3 THE MEASUREMENT OF EMOTIONS

The Emotions Profile Index (EPI) was used to measure the emotions of adolescents with good eating habits and adolescents with bad eating habits. The test was administered to 40 pupils selected randomly on the basis of their healthy or unhealthy eating habits measured on the EHQA (20 in each group).

4.4.3.1 EMOTIONS PROFILE INDEX (EPI)

The Emotions Profile Index measures a person's emotions as well as interactions between them.

The following dimensions are measured, namely:

- Gregarious dimension (Reproduction)
- Trustful dimension (Incorporation)
- Dyscontrol dimension (Orientation)
- Timid dimension (Protection)
- Depressed dimension (Reintegration)
- Distrustful dimension (Rejection)
- Control dimension (Exploration)
- Aggressive dimension (Destruction)

A score of 70% or more on a dimension indicates a high score and a score of 40% or less on a dimension indicates a low score.

4.4.4 THE MEASUREMENT OF THE SELF-CONCEPT

The pupils' self-concept was measured by means of the "Adolescent Self-Concept Scale" (ASCS). The test was administered to 40 pupils, randomly selected, of whom 20 were identified as having unhealthy eating habits and 20 as having healthy eating habits on the EHQA.

4.4.4.1 ADOLESCENT SELF-CONCEPT SCALE (ASCS)

The ASCS is a test constructed to measure the self-concept of adolescents. It consists of six subtests. The structure consists of the following constructs:

- an overall self-concept
- Dimension I
the physical self – the self in relation to physical factors
- Dimension II
the personal self – the self in relation to its own psychological relationships
- Dimension III
the family self – the self in relation to family relationships
- Dimension IV
the social self – the self in relation to social relationships
- Dimension V
the moral-ethical self – the self in relation to moral, religious norms
- Dimension VI
self-criticism – the self in relation to self-criticism.

Each dimension is measured with regard to identity, acceptance and behaviour in that particular dimension.

4.4.4.2 RELIABILITY OF THE ASCS

The reliability of the ASCS using the test-retest method was found to be 0,85.

4.4.5 THE MEASUREMENT OF PERSONALITY

The High School Personality Questionnaire (HSPQ) was used to measure the personality of adolescents. The test was administered to 40 pupils selected randomly on the basis of their healthy or unhealthy eating habits.

4.4.5.1 THE HIGH SCHOOL PERSONALITY QUESTIONNAIRE (HSPQ)

The HSPQ measures all major dimensions of the personality of a person aged between 12 and 18 years. The 14 personality factors include:

- Factor A: Reserved / Outgoing
- B: Concreteness / Abstract Thinking
- C: Emotional Instability / Emotional Stability
- D: Phlegmatic Temperament / Excitability
- E: Submissiveness / Dominance
- F: Soberness / Carefreeness
- G: Opportunistic / Conscientiousness
- H: Shyness / Social Boldness
- I: Tough-Mindedness / Tender-Mindedness
- J: Zestfulness / Individualism
- O: Self-Assurance / Proneness to Guilt Feelings
- Q2: Group Dependency / Self-sufficiency
- Q3: Low Self-Sentiment Integration / High Self-Sentiment Integration
- Q4: Low Ergic Tension / High Ergic Tension

The raw scores can be converted to a stanine scale (a nine-point scale) or a sten scale (a ten-point scale).

4.4.5.2 RELIABILITY OF THE HSPQ

The reliability of the HSPQ varies from 0,53 to 0,78 and the reliability coefficients can be regarded as satisfactory for a questionnaire of this nature (Visser et al 1995:45).

4.5 PROCEDURE FOLLOWED DURING THE EMPIRICAL INVESTIGATION

After the questionnaire was administered as outlined in paragraph 4.4.1.3, IQ information was obtained from the Ed-Lab cards. Results were tabulated for processing by the computer.

Pupils with unhealthy eating habits and pupils with healthy eating habits were identified. Identification was done on the basis of high scores obtained on the Eating Habits Questionnaire for Adolescents (EHQA). 20 pupils with unhealthy eating habits and 20 pupils with healthy eating habits were selected at random. These 40 pupils wrote the following tests: Emotions Profile Index (EPI), Adolescent Self-concept Scale (ASCS) and the High School Personality Questionnaire (HSPQ). Results were processed on computer.

4.6 PROCESSING THE RESULTS

4.6.1 THE EATING HABITS QUESTIONNAIRE FOR ADOLESCENTS

An item analysis is done for the EHQA as a whole. The alpha-coefficient is used to determine the reliability of the measuring instrument.

The norms of the EHQA are determined so that researchers who use the instrument will be able to interpret their results in the light of the present study's results.

4.6.2 TESTING OF THE HYPOTHESES

T-tests are used to determine whether hypotheses 1, 2, 3, 4, 5, 8, 9 and 10 should be accepted or rejected. The F-test and t-test are used to determine whether hypotheses 6 and 7 should be accepted or rejected.

4.7 CONCLUSION

This chapter covered the planning and the execution of the empirical investigation. Chapter 5 deals with statistical processing and interpretation of the data.

CHAPTER 5

RESULTS OF THE EMPIRICAL INVESTIGATION

5.1 INTRODUCTION

The data of the empirical investigation were processed in order to test the hypotheses that were formulated in Chapter 4 (refer to section 4.2). It was decided that a new instrument would be developed to measure the eating habits of adolescents, specifically. The development of the EHQA was discussed in the previous chapter (section 4.4.1).

In order to test the hypotheses, the newly developed EHQA was administered to 340 pupils. Each pupil's age and gender were also obtained. A further sample of 40 pupils (out of the original 340) was then selected and their IQ scores were recorded. The EPI, HSPQ and ASCS were administered to the sample of 40 pupils. The data were then processed using the statistical techniques described in section 4.6. The results of these calculations will be discussed in this chapter.

5.2 ITEM ANALYSIS OF THE EHQA

The EHQA consists of four dimensions, namely, external factors (the influence of parents, friends and the media), emotional aspects, knowledge of nutrition and behaviour (refer to section 4.4.1.2).

An item analysis was done for the total questionnaire to establish whether each of the items made a contribution to the questionnaire as a whole. For this reason item-total correlations were calculated. In the case where an item-total correlation is low or negative, such an item would be left out.

Another aspect of the item analysis is the Alpha reliability coefficient. The reliability coefficient is calculated for the total questionnaire, in the event that all the items are retained. The reliability coefficient is also calculated when a

specific item is left out. An item can be omitted if it will result in a significant higher reliability coefficient. Table 5.1 indicates an item-total correlation analysis for the questionnaire.

On the basis of the item-total correlation, and the reliability coefficient, one can decide whether a specific item should be retained or should be left out.

Table 5.1 Item analysis of the EHQA

No of students	: 340	
No of items	: 86	
Alpha reliability coefficient	: 0.83	
Item	Item Correlation with Total	Alpha if Item is Left Out
1	0.121521	0.825531
2	0.076880	0.826746
3	0.119572	0.825697
4	0.408275	0.820298
5	0.019563	0.827589
6	0.265297	0.823370
7	0.109528	0.825713
8	0.141984	0.825365
9	-0.084178	0.828589
10	0.169186	0.825173
11	0.231027	0.823925
12	-0.133305	0.829730
13	0.222619	0.824133
14	0.299925	0.822782
15	0.190448	0.824711
16	0.466227	0.818772
17	0.488664	0.818106
18	0.403938	0.820746
19	0.220285	0.824127
20	0.263611	0.823306
21	0.398013	0.820997
22	0.073513	0.826940
23	0.364675	0.821226
24	0.245870	0.823666

Table 5.1 Item analysis of the EHQA

Item	Item Correlation With Total	Alpha if Item is Left Out
25	0.454068	0.819693
26	0.498257	0.818460
27	0.314718	0.822555
28	0.192556	0.824645
29	0.269302	0.823319
30	0.055787	0.826771
31	0.307658	0.822633
32	-0.048171	0.828948
33	0.070436	0.826700
34	0.196589	0.824550
35	0.319785	0.822804
36	0.407491	0.819961
37	0.066890	0.826617
38	0.499473	0.818556
39	-0.069285	0.828410
40	0.464506	0.818742
41	0.065071	0.826951
42	0.145075	0.825379
43	0.109021	0.826099
44	0.244892	0.823805
45	0.081601	0.826367
46	0.161398	0.825072
47	0.205650	0.824384
48	0.109770	0.825705
49	0.072368	0.826578
50	0.094360	0.826312
51	0.096872	0.826245
52	0.254353	0.823500
53	0.103043	0.825934
54	0.237323	0.823876
55	0.221615	0.824104
56	-0.078867	0.828340
57	0.223140	0.824099
58	0.212012	0.824400
59	0.223449	0.824152
60	0.133803	0.825690
61	0.187222	0.824773
62	0.075605	0.826596
63	0.177487	0.824833
64	0.216783	0.824184
65	0.239573	0.824345
66	0.223594	0.824060

Table 5.1 Item analysis of the EHQA (contd)

Item	Item Correlation with Total	Alpha if Item is Left Out
67	0.186150	0.824752
68	0.108027	0.825661
69	0.273419	0.823102
70	0.325258	0.823779
71	0.253319	0.823518
72	0.228517	0.823969
73	0.151135	0.825282
74	0.162014	0.825057
75	0.524160	0.817502
76	0.464819	0.818451
77	0.123629	0.825678
78	0.002114	0.827479
79	0.030234	0.827324
80	0.035779	0.826975
81	0.421881	0.819420
82	0.353402	0.822514
83	0.036478	0.827902
84	0.298793	0.822551
85	0.193144	0.824591
86	-0.019711	0.827984

Table 5.1 Item analysis of the EHQA (contd)

According to the information in table 5.1, items 2, 5, 22, 30, 33, 37, 41, 45, 49, 50, 51, 62, 78, 79, 80 and 83, showed a low correlation with the total. Items 9, 12, 32, 39, 56, 86 showed a negative correlation. In the case where an item made no contribution or contributed negatively to the total, that item was omitted.

When the items mentioned above were omitted, the Alpha reliability coefficient for the Questionnaire changed from 0,83 to 0,87. In total 64 items were retained.

5.3 RELIABILITY OF THE EHQA

When an instrument is developed, an attempt is made to obtain a reliability coefficient as close to 1 as possible. The closer the reliability of a measuring instrument is to 1, the smaller the difference is between the variance of the actual score and the observed score.

For practical reasons, the test-retest method of determining the reliability of the EHQA could not be used. Testing a second time would influence the spontaneous responses of the testees.

The reliability was arrived at by calculating the Alpha coefficient for the total EHQA. The reliability coefficient for the EHQA is 0,87. This value is very close to 1 and therefore the EHQA can be considered to be a reliable measuring instrument.

5.4 VALIDITY OF THE EHQA

With regard to the validity of the questionnaire, an attempt was made to focus on content validity. The items were developed based on the literature study and a conclusion was reached that eating habits are related to various aspects such as external factors (the influence of parents, friends and the media), emotional factors, knowledge of nutrition and behaviour (kinds of eating behaviour and physical exercise).

These aspects can be related to eating habits and the questionnaire was developed on the basis of this information (refer section 4.4.1.1). The EHQA can therefore be considered to be content valid.

5.5 DETERMINING THE NORMS OF THE EHQA

A norm is an objective standard used to interpret the scores on a measuring instrument.

The stanine norm, which is used most frequently, is based on standard scores that have been grouped into nine categories. The nine categories are indicated in table 5.2. To calculate the stanines for the total EHQA, the cumulative percentages for the total EHQA were obtained. The stanines obtained are set out in table 5.3.

Table 5.2 Limits and areas of stanines

Stanine	Limits	% of Area
9	+ ∞ to +1,75 z	4
8	+1,75z to +1,25z	7
7	+1,25z to +0,75z	12
6	+0,75z to +0,25z	17
5	+0,25z to -0,25z	20
4	-0,25z to -0,25z	17
3	-0,75z to -0,75z	12
2	-1,25z to -1,75z	7
1	-1,75z to - ∞	4

(Mulder 1996:205)

Table 5.3 Transformation of raw scores into stanines for total EHQA

Raw Score	Cumulative Frequency	Cumulative Percentage	Stanine
90	1	0.3	1
93	2	0.7	1
96	3	1.0	1
97	4	1.3	1
99	5	1.7	1
101	6	2.0	1
102	7	2.3	1
103	9	3.0	1
105	12	4.0	1
106	16	5.3	2
107	18	6.0	2
108	22	7.3	2
109	25	8.3	2
110	26	8.7	2
111	29	9.7	2
112	34	11.3	2
113	35	11.7	3
114	38	12.7	3
115	42	14.0	3
116	46	15.3	3
117	51	17.0	3
118	58	19.3	3
119	63	21.0	3
120	67	22.3	3

Table 5.3 Transformation of raw scores into stanines for total EHQA (contd)

Raw Score	Cumulative Frequency	Cumulative Percentage	Stanine
121	71	23.7	4
122	77	25.7	4
123	83	27.7	4
124	90	30.0	4
125	97	32.3	4
126	103	34.3	4
127	109	36.3	4
128	120	40.0	4
129	128	42.7	5
130	133	44.3	5
131	141	47.0	5
132	147	49.0	5
133	153	51.0	5
134	162	54.0	5
135	166	55.3	5
136	172	57.3	5
137	177	59.0	5
138	180	60.0	5
139	184	61.3	6
140	190	63.3	6
141	197	65.7	6
142	203	67.7	6
143	211	70.3	6
144	214	71.3	6
145	221	73.7	6
146	226	75.3	6
147	231	77.0	6
148	233	77.7	7
149	238	79.3	7
150	242	80.7	7
151	244	81.3	7
152	248	82.7	7
153	249	83.0	7
154	253	84.3	7
155	256	85.3	7
156	260	86.7	7
157	264	88.0	7
158	267	89.0	7
159	270	90.0	8
160	271	90.3	8
161	274	91.3	8
162	276	92.0	8

Table 5.3 Transformation of raw scores into stanines for total EHQA (contd)

Raw Score	Cumulative Frequency	Cumulative Percentage	Stanine
163	278	92.7	8
164	279	93.0	8
165	280	93.3	8
166	282	94.0	8
167	285	95.0	8
171	287	95.7	8
172	288	96.0	8
173	289	96.3	9
174	290	96.7	9
175	292	97.3	9
177	294	98.0	9
178	296	98.7	9
183	297	99.0	9
186	298	99.3	9
188	299	99.7	9
192	300	100.0	9

Using the total score for the EHQA, it is possible to establish whether an individual's eating habits are below average, average or above average.

As a general rule, the bottom three stanines (1, 2 and 3) are regarded as below average, the next three stanines (4, 5 and 6) as average, and the top three stanines (7, 8 and 9) as above average (Mulder 1996:205). For the purpose of the EHQA this general rule is not adopted since the higher the score obtained, the unhealthier the eating habit. The classification of the scores is given in table 5.4.

Table 5.4 Limits and areas of stanines for the EHQA

Stanine	Limits	% of Area	
1	64 – 105	4	Good
2	106 – 112	7	
3	113 – 120	12	
4	121 – 128	17	Average
5	129 – 138	20	
6	139 – 147	17	
7	148 – 158	12	Bad
8	159 – 172	7	
9	173 – ∞	4	

From the classification of the scores in table 5.4 one can see that the lower the score, the lower the stanine and the healthier the eating habits.

5.6 TESTING OF HYPOTHESES

5.6.1 HYPOTHESIS 1

With regard to Hypothesis 1, stated in section 4.2.1, the following null hypothesis was tested:

There is no significant difference between boys and girls with regard to eating habits.

All 340 pupils were used to test this hypothesis. Group A represents 162 males while Group B represents 178 females. To determine whether the average eating habits of Group A differed from Group B, the mean of each Group was calculated and compared. The t-test was used to determine whether the two means differed significantly and the results appear in table 5.5.

Table 5.5. Difference between the average eating habit scores of males and females

Variable	Group	N°	Mean	S	T	D.F.	P
GENDER	A	162	125,87	16,85			
	B	178	136,67	19,66	5,4164	338	p<0,01

According to table 5.5, a t-value of 5,42 was obtained with $p < 0,01$. The null hypothesis can be rejected at the 1% level of significance. There is a significant difference between the means. It seems that boys differ from girls with regard to eating habits. The average eating habit score of boys is lower than that of girls, indicating that boys tend to have healthier eating habits than girls.

The results of this research support the findings of Anderson (1984:901), Yager (1984:427), Williams (1989:357) and Monro (1996:69), (refer sections 2.3.2.2, 3.3.2, and 3.5.3) that girls eat less than boys do in order to achieve a slender appearance. Nichter (1994:109) also reported that girls eat less food because they believe that in order to be liked by boys, they must be thin. Gerdes (1981:67), Johnson (1987:670), Jablov (1992:94) and Carson (1992:330) concur with these views (refer sections 2.5.2.2, 2.5.4.1, 3.3.2, 3.5.2, 3.5.3) and found that girls perceive the image of slimness promoted in the media as a prerequisite for being successful in life. According to Merlo (1993:25), Apfelbaum (1993:433) and Keel (1996:213) (refer sections 2.3.2.2 and 3.3.2), girls are at a greater risk of developing unhealthy eating behaviour because they tend to experience more stress during puberty than boys do. The high level of stress experienced by girls can be attributed to physical and physiological changes that take place during puberty as well as their preoccupation with their physique and weight. However girls can eat less than boys for natural biological reasons.

From the above, it can be concluded that girls develop unhealthier eating habits than boys and are therefore at a higher risk of developing eating disorders.

5.6.2 HYPOTHESIS 2

With regard to Hypothesis 2, stated in section 4.2.2, the following null hypothesis was tested:

There is no significant difference in the average eating habits of adolescents who participate in sport and adolescents who do not participate in sport.

To test this hypothesis, all 340 pupils were used. Group A consisted of 268 pupils who participate in sport. Group B consisted of 72 pupils who do not participate in sport. To determine whether the average eating habits of Group A differed from Group B, the mean of each group was calculated. The t-test was used to determine whether the means differed significantly or not. These results appear in table 5.6.

Table 5.6 Difference between the average eating habits scores of pupils who participate in sport and pupils who do not participate in sport

Variable	Group	No.	Mean	S	T	DF	P
Sport	A	268	129,61	18,15	3,6362	338	p<0,01
	B	72	138,68	21,03			

According to table 5.6, a t-value of 3,6362 was obtained with $p < 0,01$. This means that the null hypothesis can be rejected at the 1% level of significance. It seems that there is a significant difference between the average eating habits of adolescents who participate in sport and adolescents who do not participate in sport. Pupils who participate in sport tend to have better eating habits than pupils who do not participate in sport.

The research done by Ferrairi (1993:331) (refer section 2.5.4.1), on the eating habits of overweight pupils, revealed that adolescents who do not participate in physical activities have unhealthy eating habits. Jablow (1992:97) (refer section

3.7) found that overweight adolescents who have unhealthy eating habits avoid physical activities because they experience sport as difficult, frustrating and embarrassing. It appears then, that in general, the difference between the eating habits of adolescents who participate in sport and adolescents who do not participate in sport was significant in their research. The results of this study are in agreement with those obtained by Ferrairi and Jablow.

5.6.3 HYPOTHESIS 3

With regard to hypotheses stated in section 4.2.3, the following null hypotheses were tested:

Hypothesis 3a

There is no significant difference in the average eating habits of adolescents who have good relationships with their mothers and adolescents who do not have good relationships with their mothers.

Hypothesis 3b

There is no significant difference in the average eating habits of adolescents who have good relationships with their fathers and adolescents who do not have good relationships with their fathers.

To test the hypotheses, all 340 pupils were used.

To test hypothesis 3a two groups were used. A consisted of 321 pupils who have a good relationship with their mother and Group B consisted of 19 pupils who do not have a good relationship with their mother.

Group C consisted of 272 pupils who have a good relationship with their father and Group D consisted of 68 pupils who do not have a good relationship with their father.

To determine whether the average eating habits of Group A differed from Group B, the mean of each group was calculated using the total questionnaire. The t-test was used to determine whether the means differed significantly or not. These results appear in table 5.7. The same procedure was followed to test hypothesis 3b. The results appear in table 5.8

Table 5.7 Difference between the average eating habit scores of pupils who have good relationships with their mothers and pupils who do not have good relationships with their mothers

Variable	Group	No.	Mean	S	T	DF	P
Relationship with mother	A	321	131,69	19,28	0,6419	338	p>0,05
	B	19	128,79	16,60			

Table 5.8 Difference between the average eating habit scores of pupils who have good relationships with their fathers and pupils who do not have good relationships with their fathers

Variable	Group	No.	Mean	S	T	DF	P
Relationship with father	C	272	130,97	18,73	1,0846	338	p>0,05
	D	68	133,78	20,65			

According to table 5.7, a t-value of 0,6419 was obtained with $p > 0,05$. The null hypothesis cannot be rejected. It seems that there is no significant difference between the average eating habits of adolescents who have a good relationship with their mother and adolescents who do not have a good relationship with their mother.

According to table 5.8, a t-value of 1,0846 was obtained with $p > 0,05$. The null hypothesis cannot be rejected. It seems that there is no significant difference between the average eating habits of adolescents who have a good relationship with their father and adolescents who do not have a good relationship with their father.

The results of this research does not support the findings in the literature study (refer sections 2.4.4.4, 2.5.1, 2.5.4.1 and 3.6.3) that unhealthy eating behaviour is manifested by adolescents who do not have a good relationship with their parents. One possible explanation might be that pupils might not have answered truthfully when questions related to their relationship with their parents were asked. Another possible explanation might be that pupils who are brought up by their guardians or who live in hostel might consider their relationship with their parents as positive since they rarely or never see their parents.

5.6.4 HYPOTHESIS 4

With regard to hypotheses stated in section 4.2.4, the following null hypotheses were tested:

Hypothesis 4a

There is no significant difference in the average eating habits of adolescents who have knowledge of the health risks of obesity and adolescents who do not have knowledge of the health risks of obesity.

Hypothesis 4b

There is no significant difference in the average eating habits of adolescents who have knowledge of the dangers of excessive dieting and adolescents who do not have knowledge of the dangers of excessive dieting.

To test the hypotheses, all 340 pupils were used.

To test hypothesis 4a two groups were used. Group A consisted of 219 pupils who have knowledge of the health risks of obesity and Group B consisted of 121 pupils who do not have knowledge of the health risks of obesity.

With regard to hypothesis 4b, Group C consisted of 260 pupils who have knowledge of the dangers of excessive dieting and Group D consisted of 80 pupils who do not have knowledge of the dangers of excessive dieting.

To determine whether the average eating habits of Group A differed from Group B, the mean of each group was calculated for the total questionnaire. The t-test was used to determine whether the means differed significantly or not. The results appear in table 5.9. The same procedure was followed to test hypothesis 4b. The results appear in table 5.10.

Table 5.9 Difference between the average eating habit scores of pupils who have knowledge of the health risks of obesity and pupils who do not have knowledge of the health risks of obesity

Variable	Group	No.	Mean	S	T	DF	P
Obesity	A	219	128,99	18,16	3,3467	338	p<0,01
	B	121	136,13	20,04			

Table 5.10 Difference between the average eating habit scores of pupils who have knowledge of the dangers of excessive dieting and pupils who do not have knowledge of the dangers of excessive dieting

Variable	Group	No.	Mean	S	T	DF	P
Dieting	C	260	130,25	18,25			
	D	80	135,70	21,36	2,2429	338	p<0,05

According to table 5.9, a t-value of 3,3467 was obtained with $p < 0,01$. The null hypothesis can be rejected at the 1% level of significance. It seems that there is a significant difference between the average eating habits of adolescents who have knowledge of the health risks of obesity and adolescents who do not have knowledge of the health risks of obesity. Pupils who have knowledge of the health risks of obesity tend to have healthier eating habits than pupils who do not have knowledge of the health risks of obesity.

According to table 5.10, a t-value of 2,2429 was obtained with $p < 0,05$. The null hypothesis can be rejected at the 5% level of significance in this case. It seems that there is a significant difference between the average eating habits of adolescents who have knowledge of the dangers of excessive dieting and adolescents who do not have knowledge of the dangers of excessive dieting. Pupils who have knowledge of the dangers of excessive dieting tend to have healthier eating habits than pupils who do not have knowledge of the dangers of excessive dieting.

The results of this research support the findings noted in the literature study (refer sections 2.4.2.2, 2.5.4.1, 3.5.4 and 3.6.3). Neil (1994:151), Ross (1995:315), Brook (1997:283), Schumaker (1997:275) McCullum (1997:181) and Ahmad (1997:489) reported that the knowledge that adolescents have concerning nutrition is insufficient and that adolescents do not know the consequences of unhealthy eating behaviour. It was also found that pupils in

general are unable to choose foods on the basis of nutritional value. Clark (1990:68) and Ferrairi (1993:331) found that overweight adolescents eat high calorie diets with excessive protein as well as fat and tend to be unaware of the dangers of obesity.

Thus, from the present research results, one can conclude that adolescents who do not develop good eating habits tend to lack knowledge of nutrition and do not understand the consequences of unhealthy eating behaviour.

The next chapter looks at possible suggestions that parents and teachers could use to make adolescents more aware of the importance of developing healthy eating habits.

5.6.5 HYPOTHESIS 5

With regard to hypothesis 5 stated in section 4.2.5, the following null hypothesis was tested:

There is no significant difference between the average intelligence of adolescents with good eating habits and adolescents with bad eating habits.

To test this null hypothesis, the t-test was used to determine whether the means differed significantly or not. The scores of 36 pupils were used to test this hypothesis. Group A consisted of 16 pupils with good eating habits and Group B consisted of 20 pupils with bad eating habits. These groups were compiled using the norms in table 5.4. The difference between the means was 16,19. These results appear in table 5.11.

Table 5.11 Difference between the average intelligence of pupils with good eating habits and that of pupils with bad eating habits.

Variable	Group	No.	Mean	S	T	DF	P
I.Q.	A	16	81,06	25,47	2,2115	34	p<0,05
	B	20	97,25	18,44			

According to table 5.11, a t-value of 2,2115 was obtained with $p < 0,05$. The null hypothesis can be rejected at the 5% level of significance. It seems that there is a significant difference between the average intelligence of adolescents with good eating habits and adolescents with bad eating habits. Those with good eating habits had a lower average IQ compared to those with bad eating habits.

Previous research in this area has yielded conflicting results (refer section 2.3.2.1 and 3.4.4) Canals (1996:448) found that adolescents with low intelligence are at risk of developing unhealthy eating behaviour. Sanders (1995:11) found that adolescents with high intelligence are at risk of developing unhealthy eating behaviour.

The results of this study do not indicate that adolescents with good eating habits have a high intelligence since the average intelligence of Group A is 81,06. The results do indicate that pupils with bad eating habits tend to have a higher average intelligence than pupils with good eating habits. A possible reason why an overweight adolescent with high intelligence might develop unhealthy eating habits is that he may overeat as a mechanism to cope with the demands of maintaining good academic results. A possible reason why an underweight adolescent with high intelligence might develop unhealthy eating habits is that she might be critical of her physical appearance and therefore she may undereat to maintain a slim figure.

5.6.6 HYPOTHESIS 6

With regard to hypothesis 6 stated in section 4.2.6, the following null hypothesis was tested:

There is no significant difference between the average eating habits of adolescents and the order of the child in the family.

The subjects were divided into the following four groups on the basis of their position in the family.

- Group 1: Those who were the youngest child.
- Group 2: Those who were the eldest child.
- Group 3: Those who were the middle child.
- Group 4: Those who were the only child.

The average eating habits for each of the four groups was calculated. In order to compare these averages, an analysis of variance was carried out. These results appear in table 5.12.

Table 5.12 Results of the analysis of variance for the total EHQA for hypothesis 6

Group	N	Mean	SD
Youngest (1)	106	130,78	17,89
Eldest (2)	110	129,30	18,39
Middle (3)	97	137,20	20,24
Only (4)	27	123,15	18,24

$F(3,336) = 5,32$ $p < 0,01$

The null hypothesis can be rejected at the 1% level of significance. There is a significant difference between the average eating habit scores of the four groups.

In order to determine between which groups this difference exists, the t-values were calculated. These results appear in table 5.13.

Table 5.13 T-test analysis of the total EHQA

Groups	Difference between the means	T Value	Significance
3 – 1	6,42	T < 2,65	p > 0,05
3 – 2	7,91	T > 2,65	p < 0,05
3 – 4	14,06	T > 2,65	p < 0,05
1 – 2	1,48	T < 2,65	p > 0,05
1 – 4	7,64	t < 2,65	p > 0,05
2 – 3	-7,91	t > 2,65	p < 0,05
2 – 1	-1,48	t < 2,65	p > 0,05
2 – 4	6,15	t < 2,65	p > 0,05
4 – 3	-14,06	t > 2,65	p < 0,05

There are significant differences between the average eating habits of the pupils who hold a middle child position in the family, (Group 3). In both cases the eating habits of the middle child seem to be less healthy than those of the eldest child or an only child.

Research with regard to eating habits and the order of the child in a family could not be found. A possible reason why the middle child may develop bad eating

habits could be that parents are more involved with the activities as well as the eating behaviour of the first born and the youngest child and the middle child tends to be neglected.

5.6.7 HYPOTHESIS 7

With regard to hypotheses 7a and 7b stated in section 4.2.7, the following null hypotheses were tested:

Hypothesis 7 a

There is no significant difference between the average eating habits of adolescents and the physical appearance of their mother.

Hypothesis 7 b

There is no significant difference between the average eating habits of adolescents and the physical appearance of their father.

The subjects were divided into the following three groups on the basis of the physical appearance of their parents.

Hypothesis 7a

- Group 1: Those whose mother was thin.
- Group 2: Those whose mother was overweight.
- Group 3: Those whose mother was normal weight.

Hypothesis 7 b

- Group 4: Those whose father was thin.

- Group 5: Those whose father was overweight.
- Group 6: Those whose father was normal weight.

The average eating habits for each of the three groups (for 7a and 7b) was calculated. In order to compare these averages, an analysis of variance was carried out. These results appear in tables 5.14 and 5.15.

Table 5.14 Results of the analysis of variance for the total EHQA for hypothesis 7a

Group	N	Mean	SD
Thin mother (1)	33	129,27	15,79
Overweight Mother (2)	71	134,65	19,89
Normal weight Mother (3)	236	130,91	19,29

$F(2,337) = 1,30$ $p > 0,05$

There is no significant difference between the average eating habits scores of the three groups. The null hypothesis cannot be rejected. This indicates that the physical appearance of the mother does not relate to the eating habits of the adolescent.

Table 5.15 Results of the analysis of variance for the total EHQA for hypothesis 7 b

Group	N	Mean	SD
Thin father (4)	13	140,61	22,22
Overweight Father (5)	81	133,68	17,69
Normal weight Father (6)	245	130,24	19,29

$F(2,336) = 2,55$ $p > 0,05$

The null hypothesis cannot be rejected since there is no significant difference between the average eating habits scores of the three groups. This indicates that the physical appearance of the father does not relate to the eating habits of the adolescent.

These results do not confirm the ideas of other researchers such as Jablow (1992:99) and Brook (1997:287) who, although they had not done any specific research in this particular area, suggested that eating habits are related to the eating behaviour and physical appearance of parents.

5.6.8 HYPOTHESIS 8

With regard to hypothesis 8, stated in section 4.2.8, the following null hypothesis was tested:

There is no significant difference between the average emotions of adolescents with good eating habits and adolescents with bad eating habits.

The scores of 36 pupils were used to test this hypothesis. Group A consisted of 16 pupils with good eating habits and Group B consisted of 20 pupils with bad eating habits. These groups were compiled using the norms in table 5.4. The means for each dimension on the EPI was calculated. The t-test was used to determine whether the means differed significantly or not. The results appear in table 5.16.

Table 5.16 Difference between the average emotions of pupils with good eating habits and pupils with bad eating habits

Variable	Group	N	Mean	SD	T	DF	
Emotions (Trust)	A	16	21,44	2,37	2,3282	34	p < 0,05
	B	20	17,90	5,68			
Emotions (Distrust)	A	16	11,94	3,45	0,5533	34	p > 0,05
	B	20	11,25	3,89			
Emotions (Timid)	A	16	15,25	4,84	1,4198	34	p > 0,05
	B	20	12,85	5,19			
Emotions (Depressed)	A	16	5,44	4,05	1,3307	34	p > 0,05
	B	20	7,10	3,45			
Emotions (Dyscontrol)	A	16	7,38	3,18	1,8744	34	p > 0,05
	B	20	10,30	5,55			
Emotions (Controlled)	A	16	18,81	3,37	0,3137	34	p > 0,05
	B	20	18,35	5,06			
Emotions (Aggressive)	A	16	6,75	4,52	2,1794	34	p < 0,05
	B	20	10,85	6,34			
Emotions (Gregarious)	A	16	16,50	2,25	1,3268	34	p > 0,05
	B	20	15,05	3,87			

According to table 5.16, a t-value of 2,3282 with $p < 0,5$ on the Trust dimension was obtained and the difference between the means was 3,54. A t-value of

2,1794 with $p < 0,5$ on the Aggressive dimension was obtained and the difference between the means was 4,1. The figures suggest that the null hypothesis can be rejected at the 5% level of significance with regard to **Trust** and **Aggressiveness**. It seems that there is a significant difference between the means of the two groups on these dimensions. These results reveal that adolescents with good eating habits tend to be more trustful than adolescents with bad eating habits. The results also reveal that adolescents with good eating habits tend to be less aggressive than adolescents with bad eating habits.

The results obtained in this study support research findings as noted in sections 2.4.4.5, 2.5.3.2, 2.4.4.1, 3.3.2, 3.5.3 and 3.5.4. Robinson (1982:221), Roth (1982:93), Epanchin (1987:179), Williams (1989:508) and Jablow (1992:80) all concur that adolescents who experience emotions such as anxiety and depression as a result of pubertal changes, tend to develop bad eating habits. It was also found that adolescents develop bad eating habits by, for example, eating junk food to relieve emotional tension experienced during puberty (Garner 1985:255; Cooper 1985:129; Johnson 1987:673 and Carson 1992:245).

Previous research findings with regard to specific emotions such as trust and aggression could not be found. A possible reason why pupils with good eating habits tend to be more trustful than pupils with bad eating habits might be that trustful pupils tend to be obedient and, therefore, tend to follow a healthy diet. A possible reason why pupils with bad eating habits tend to be more aggressive than pupils with good eating habits is that hormonal changes during puberty could make them more aggressive and therefore they tend to develop bad eating habits. Heightened emotional tension occurs as a result of physical and glandular changes that take place during puberty. Many adolescents experience frustrations as well as feelings of helplessness and may develop bad eating habits to cope with aggression (refer section 3.7).

5.6.9 HYPOTHESIS 9

With regard to hypothesis 9, stated in section 4.2.9, the following null hypothesis was tested:

There is no significant difference between the average self-concept of adolescents with good eating habits and adolescents with bad eating habits.

The scores of 36 pupils were used to test this hypothesis. Group A consisted of 16 pupils with good eating habits and Group B consisted of 20 pupils with bad eating habits. The groups were compiled using the norms in table 5.4. The means for the total ASCS was calculated as well as the means for each dimension on the ASCS (refer section 4.4.3.1). The t-test was used to determine whether the means differed significantly or not. The results appear in table 5.17.

Table 5.17 Difference between the average self-concept of pupils with good eating habits and pupils with bad eating habits

Variable	Group	N	Mean	SD	T	DF	P
Self-concept (total)	A	16	74,56	8,42	4,5085	34	p < 0,01
	B	20	58,30	12,29			
Self-concept (physical self)	A	16	13,00	2,33	6,3068	34	p < 0,01
	B	20	7,35	2,91			
Self-concept (personal self)	A	16	13,56	3,29	3,1603	34	p < 0,01
	B	20	9,95	3,50			
Self-concept (family self)	A	16	14,19	2,23	2,4858	34	p < 0,05
	B	20	11,70	3,47			
Self-concept (social self)	A	16	12,81	2,34	1,5746	34	p > 0,05
	B	20	11,00	4,09			

Table 5.17 Difference between the average self-concept of pupils with good eating habits and pupils with bad eating habits (contd.)

Variable	Group	N	Mean	SD	T	DF	P
Self-concept (moral-ethical self)	A	16	12,31	2,75	2,4019	34	p < 0,05
	B	20	9,95	3,07			
Self-concept (self-criticism)	A	16	6,25	2,44	0,5979	34	p > 0,05
	B	20	6,70	2,08			

In order to determine whether the means differed significantly the t-values were calculated.

According to table 5.17 the following significant results were obtained:

- a t-value of 4,5085 with $p < 0,01$ and a difference between the means of 16,26 was obtained for the **total self-concept**. The null hypothesis can therefore be rejected at the 1% level of significance. There is a significant difference between the average total self-concept of the two groups. Adolescents with good eating habits tend to have a higher total self-concept than adolescents with bad eating habits.
- a t-value of 6,3068 with $p < 0,01$ and a difference between the means of 5,65 was obtained for **physical self**. The null hypothesis can therefore be rejected at the 1% level of significance. It seems that adolescents with good eating habits tend to have a higher physical self-concept compared to those with bad eating habits.
- a t-value of 3,1603 with $p < 0,01$ and a difference between the means of 3,61 was obtained for **personal self**. The null hypothesis can therefore be rejected at the 1% level of significance. It seems that adolescents with good

eating habits tend to have a higher personal self-concept compared to those with bad eating habits.

- a t-value of 2,4858 with $p < 0,05$ and a difference between the means of 2,49 was obtained for **family self**. The null hypothesis can therefore be rejected at the 5% level of significance. It seems that adolescents with good eating habits tend to have a higher family self-concept compared to those with bad eating habits.
- a t-value of 2,4019 with $p < 0,05$ and a difference between the means of 2,36 was obtained for the **moral-ethical self**. The null hypothesis can therefore be rejected at the 5% level of significance. It seems that adolescents with good eating habits tend to have a higher moral-ethical self-concept compared to those with bad eating habits.

These results seem to confirm the ideas of other researchers such as Bruch (1980:330), Mussen (1984:551) and Gillis (1992:80) (refer sections 2.5.4.1, 3.4.4, 3.5.2 and 3.6.3) who suggest that adolescents with bad eating habits tend to have a low self-concept. No significant differences were obtained on the social self and self-criticism dimensions. It is possible that adolescents change their eating habits to suit a social situation and that they are not critical of themselves.

5.6.10 HYPOTHESIS 10

With regard to hypothesis 10, stated in section 4.2.10, the following null hypothesis was tested:

There is no significant difference between the average personality type of adolescents with good eating habits and adolescents with bad eating habits.

The scores of 36 pupils were used to test this hypothesis. Group A consisted of 16 pupils with good eating habits and Group B consisted of 20 pupils with bad eating habits. The groups were compiled using the norms in table 5.4. The means for each dimension of the HSPQ (refer section 4.4.4.2) were calculated. The t-test was used to determine whether the means differed significantly or not. The results appear in table 5.18.

Table 5.18 Difference between the average personality of pupils with good eating habits and pupils with bad eating habits

Personality factor	Group	N	Mean	SD	T	DF	P
A (Reserved/Outgoing)	A	16	12,50	2,66	1,79	34	p > 0,05
	B	20	10,90	2,67			
B (Concreteness/ Abstract thinking)	A	16	7,44	2,03	1,14	34	p > 0,05
	B	20	6,75	1,59			
C (Emotional instability / Emotional stability)	A	16	10,38	2,78	1,71	34	p > 0,05
	B	20	8,60	3,32			
D (Phlegmatic temperament / Excitability)	A	16	8,69	2,94	2,71	34	p < 0,05
	B	20	11,60	3,41			
E (Submissiveness/ Dominance)	A	16	9,06	3,39	0,19	34	p > 0,05
	B	20	8,85	3,44			

Table 5.18 Difference between the average personality of pupils with good eating habits and pupils with bad eating habits (contd)

Variable	Group	N	Mean	SD	T	DF	P
F (Soberness / Carefreeness)	A	16	10,81	2,95	0,28	34	p > 0,05
	B	20	10,5	3,53			
G (Opportunistic / Conscientious)	A	16	12,44	3,41	1,45	34	p > 0,05
	B	20	11,05	2,33			
H (Shyness / Social Boldness)	A	16	12,63	2,03	5,00	34	p < 0,01
	B	20	8,45	2,80			
I (Tough - mindedness / Tender - mindedness)	A	16	13,31	4,09	0,66	34	p > 0,05
	B	20	12,55	2,86			
J (Zestfulness / Individualism)	A	16	8,06	2,54	2,17	34	p < 0,05
	B	20	9,65	1,84			
O (Self-Assurance/ Proneness to guilt feelings)	A	16	9,25	2,02	2,84	34	p < 0,01
	B	20	12,10	3,58			

Table 5.18 Difference between the average personality of pupils with good eating habits and pupils with bad eating habits (contd)

Variable	Group	N	Mean	SD	T	DF	P
Q2 (Group Dependency / Self - sufficiency)	A	16	8,06	2,26	0,41	34	p > 0,05
	B	20	8,40	2,62			
Q3 (Low self-sentiment integration/ High self - sentiment integration)	A	16	11.13	3.61	0.11	34	p>0.05
	B	20	11.00	3.24			
Q4 Low ergic tension/ High ergic tension	A	16	8,31	4,09	0,66	34	p > 0,05
	B	20	7,55	2,86			

According to Table 5.18. the following significant results were obtained:

- a t -value of 2,7055 with $p < 0,05$ and a difference between the means of 2,91 was obtained for the variable personality: **Phlegmatic Temperament / Excitability**. The null hypothesis can therefore be rejected at the 5% level of significance. It seems that adolescents with good eating habits tend to have a phlegmatic temperament whereas adolescents with bad eating habits tend to have an excitable temperament. Excitable personalities are described as having the following characteristics:
 - * demanding, overactive, uncontrolled
 - * impatient
 - * attention-seeking

- * excitable
- * prone to jealousy
- * self-interested, egotistical
- * become easily confused
- * show signs of nervousness.

(Visser et al 1995:25)

- a t-value of 5,0002 with $p < 0,01$ and a difference between the means of 4,18 was obtained for the variable personality: **Shyness / Social Boldness**. The null hypothesis can therefore be rejected at the 1% level of significance. It seems that adolescents with good eating habits tend to be socially bold whereas adolescents with bad eating habits tend to be shy. Pupils with shy personalities are described as having the following characteristics:

- * reserved, considerate
- * feel threatened easily, careful
- * reserved, unsociable, detached
- * emotionally cautious
- * modest in face of opposite sex
- * apt to be embittered
- * controlled, rule-bound.

(Visser et al 1995:29)

- a t-value of 2,1717 with $p < 0,05$ and a difference between the means of 159 was obtained for the variable personality: **Zestfulness / Individualism**. The null hypothesis can therefore be rejected at the 5% level of significance. It seems that adolescents with bad eating habits tend to show more individualism than adolescents with good eating habits. Pupils with individualistic type personalities are described as having the following characteristics:

- * circumspectively individualistic, reflective
- * act individualistically

- * guarded, wrapped up in self
- * fastidious, obstructive, emphasise trivialities, meticulous, individual interests
- * complain of chronic fatigue, pains and a lack of concentration
- * evaluate coldly, do not become involved.

(Visser et al 1995:31)

- a t-value of 2,8379 with $p < 0,01$ and a difference between the means of 2,85 was obtained for the variable personality: **Self-Assurance / Proneness to Guilt Feelings**. The null hypothesis can therefore be rejected at the 1% level of significance. It seems that adolescents with good eating habits tend to be self-assured whereas adolescents with bad eating habits tend to be prone to guilt feelings. Pupils with personalities that are prone to guilt feelings are described as having the following characteristics:

- * anxious, full of self-reproach, insecure, worrying
- * depressed, cry easily
- * touchy, overcome by moods
- * strong sense of obligation, sensitive to people's approval or disapproval
- * scrupulous, fussy
- * hypochondriacal and inadequate
- * phobic symptoms
- * lonely, brooding.

(Visser et al 1995:32)

The results obtained in this study support previous research findings as noted in sections 3.3.3, 3.5.2 and 3.5.4.

Sheldon (1944:543) identified people with bad eating habits such as overeating to have viscerotonia personality traits. People with a viscerotonia personality tend to love comfort, have a gluttony for food, need sociability and affection.

Erikson, cited in Mussen (1984:512) found that approval-orientated adolescents tend to be less autonomous than their peers. These findings are verified by Boskind-White cited in Carson (1992:245) and Hartley (1998:133) who confirm that adolescents with unhealthy eating behaviour tend to be preoccupied with pleasing others and tend to be perfectionistic. The results of this study confirm that adolescents with bad eating habits tend to lack autonomy, are rule-bound and meticulous (refer to Factor H and J on Table 5.18).

Thus, from the present results one can conclude that personality can be related to the development of eating habits.

5.7 CONCLUSION

An item analysis was carried out for the whole EHQA. Twenty-two items were excluded from the questionnaire (refer section 5.2). Thereafter the reliability of the EHQA was determined by calculating the alpha coefficient. This was found to be 0,87 indicating high reliability.

Norms for the EHQA were established by converting the raw scores to stanines.

The following conclusions were made after testing the hypotheses:

- (i) There is a significant difference between boys and girls with regard to eating habits. This applied to the total EHQA. The results revealed that boys tend to have healthier eating habits than girls.
- (ii) There is a significant difference between the average eating habits of adolescents who participate in sport and adolescents who do not participate in sport. It was found that adolescents who participate in sport tend to have better eating habits than pupils who do not participate in sport.

- (iii) There is no significant difference between the average eating habits of adolescents who have a good relationship with their parents and adolescents who do not have a good relationship with their parents.
- (iv) There is a significant difference between the average eating habits of adolescents who have knowledge of the health risks of obesity and adolescents who do not have knowledge of the health risks of obesity. It was found that adolescents who have knowledge of the health risks of obesity tend to have healthier eating habits than adolescents who do not have knowledge of the health risks of obesity.
- (v) There is a significant difference between the average eating habits of adolescents who have knowledge of the dangers of excessive dieting and pupils who do not have knowledge of excessive dieting. It was found that adolescents who have knowledge of the dangers of excessive dieting tend to have healthier eating habits than adolescents who do not have knowledge of the dangers of excessive dieting.
- (vi) There is a significant difference between the average intelligence of adolescents with good eating habits and adolescents with bad eating habits at the 5% level of significance. The results however did not indicate that pupils with bad eating habits have high intelligence. It was found that adolescents with bad eating habits have a higher average intelligence than adolescents with good eating habits.
- (vii) There is a significant difference between the average eating habits of adolescents and the order of the child in the family. It was found that a middle child tends to have unhealthier eating habits compared to an eldest or only child.

- (viii) There is no significant difference between the average eating habits of adolescents and the physical appearance of their parents.
- (ix) There is a significant difference between two of the average emotions of adolescents with good eating habits and adolescents with bad eating habits. The results obtained revealed that significant differences were found with regard to
- trust (Adolescents with good eating habits tend to be more trustful than adolescents with bad eating habits.)
 - aggression (Adolescents with bad eating habits tend to be more aggressive than adolescents with good eating habits.)
- (x) There is a significant difference between the average self-concept of adolescents with good eating habits and adolescents with bad eating habits. It was found that pupils with good eating habits have a better total self-concept than pupils with bad eating habits. The results obtained further revealed that significant differences in the self-concept occurred on the following dimensions:
- physical self (Adolescents with good eating habits tend to have a better self-concept with regard to the physical self than adolescents with bad eating habits.)
 - personal self (Adolescents with good eating habits tend to have a better self-concept with regard to the personal self than adolescents with bad eating habits.)
 - family self (Adolescents with good eating habits tend to have a better self-concept with regard to the family self than adolescents with bad eating habits.)

- moral-ethical self (Adolescents with good eating habits tend to have a better self-concept with regard to the moral-ethical self than adolescents with bad eating habits.)

(xi) There is a significant difference between the average personality of adolescents with good eating habits and adolescents with bad eating habits. Significant differences were found with regard to the following factors:

- phlegmatic temperament / excitability (Adolescents with good eating habits tend to have a phlegmatic temperament whereas adolescents with bad eating habits tend to have an excitable temperament.)
- shyness / social boldness (Adolescents with good eating habits tend to be socially bold whereas adolescents with bad eating habits tend to be shy.)
- zestfulness / individualism (Adolescents with bad eating habits tend to show more individualism than adolescents with good eating habits.)
- self-assurance / proneness to guilt. (Adolescents with good eating habits tend to be self-assured whereas adolescents with bad eating habits tend to be prone to guilt feelings.)

The following chapter will involve the educational implications of the literature and empirical findings, provide an evaluation of the research and suggestions for future research.

CHAPTER 6

EDUCATIONAL IMPLICATIONS OF THE RESEARCH AND SUGGESTIONS FOR FURTHER RESEARCH

6.1 INTRODUCTION

As stated in Chapter 1, the eating habits of adolescents is a matter of concern because of its applicability to everyday life. It appears that those adolescents who do not follow a balanced diet and overeat on junk food tend to be overweight. This is a problem in South Africa as well as other parts of the world. A further concern is the tendency among predominantly female adolescents to undereat in an attempt to obtain a slim figure in order to be acceptable to the opposite sex. Health risks that result from unhealthy eating habits are increasing rapidly in South Africa. Due to the phenomena mentioned above it would therefore appear that it is essential for adolescents to have a sound knowledge of nutrition and to follow a nutritionally balanced diet.

It was, therefore, the purpose of this study to measure the eating habits of adolescents, and to determine which factors cause adolescents to manifest unhealthy eating behaviour.

It was also the purpose of this study to recommend ways of helping adolescents, curriculum developers, schools, counsellors and the media to become aware of the problems associated with nutrition, and to promote eating behaviours that will further health, thereby reducing the risk of developing diseases as well as eating disorders.

A literature study was carried out to identify the major factors that affect eating habits. Some of the factors identified in the literature study were

- the influence of external factors such as parents, peers and the media
- emotional factors
- knowledge of nutrition

- participation in physical activities
- personality
- gender
- intelligence
- self-concept
- order of the child in the family
- race
- skipping of breakfast
- religious factors
- physical appearance of parents.

These factors appear to have varying degrees of influence on eating behaviour.

An empirical investigation was carried out to determine the effect of certain variables on the eating habits of adolescents. The results of the investigation revealed that the following variables have a significant influence on adolescent eating habits:

- gender
- participation in sport
- knowledge of nutrition
- intelligence
- order of the child in the family
- emotions
- self-concept
- personality

The educational implications of factors which influence the eating habits of adolescents will be briefly discussed in relation to:

- the curriculum
- the school

- teachers
- parents
- educational psychologists
- the community

At the end of this chapter is an evaluation of the research, as well as recommendations for further research.

6.2 EDUCATIONAL IMPLICATIONS OF THE MOST IMPORTANT FACTORS IN RELATION TO EDUCATING AN ADOLESCENT ABOUT HEALTHY EATING BEHAVIOUR

6.2.1 THE CURRICULUM

The results of the empirical investigation reveal that many adolescents do not have sufficient knowledge of nutrition and, therefore, it is recommended that a curriculum should be developed for Nutrition Education. This Nutrition Education programme ought to include a broad range of topics and activities that promote healthy eating behaviour.

Suggestions for topics to be included are the following:

- (i) Knowledge of nutrition
 - characteristics of a healthy diet for males and females
 - the nutritional value of all the food groups
 - diseases caused by a deficiency of vitamins and minerals
- (ii) Knowledge of eating disorders (their aetiology and consequences)
- (iii) Understanding the factors that influence body image and the self-concept
- (iv) Understanding the physical and physiological changes that take place during puberty

- (v) The effect of nutrition on scholastic achievement and physical development
- (vi) Incorporation of an exercise or sport programme into the school timetable
- (vii) Skills to develop a healthy eating plan
- (viii) Understanding self-responsibility in food selection
- (ix) Skills for decision making

It has been found that cognitive-focused curricula on nutrition education result in a gain in knowledge, but do not have much effect on behaviour (Byrd-Bredbenner et al 1988:341). Behaviour-based education curricula would have to be implemented to encourage healthy eating behaviour. The focus must be placed on helping adolescents to assess their own eating behaviours and to set goals to improve their food choices. Emphasis should be placed on appealing aspects of healthy eating patterns and not only on the negative consequences of unhealthy eating patterns.

The suggestions above apply to the following factors identified in the empirical investigation in relation to eating behaviour:

- **gender** – covered in topic number (i). The literature study as well as the empirical investigation revealed that girls tend to develop poorer eating habits than boys. The literature study also revealed that boys require more kilojoules than girls (refer section 2.2.3.1).
- **knowledge of nutrition** – covered in topics numbered (i), (ii), (v) and (vii). The literature study as well as the empirical investigation revealed that adolescents with bad eating habits do not have sufficient knowledge of nutrition, particularly with regard to the dangers of eating disorders such as obesity, anorexia and bulimia.
- **participation in physical activities** – covered in topic numbered (vi). The literature study as well as the empirical investigation revealed that adolescents who do not participate in sport tend to have unhealthy eating

habits. It was further found that overweight adolescents avoid physical activities (refer section 3.7).

- **emotional aspects** – covered in topic numbered (iv). The literature study revealed that various emotions experienced by adolescents can influence their eating habits negatively. The empirical investigation indicates that adolescents who are distrustful and aggressive tend to have unhealthy eating habits.
- **self-concept** – covered in topics numbered (iii), (viii) and (ix). Both the literature study and the empirical investigation indicate that adolescents with bad eating habits tend to have a low self-concept.
- **intellectual ability** – covered in topic numbered (v). The literature study yielded conflicting results with regard to intellectual ability and eating habits. The empirical investigation revealed that adolescents with bad eating habits tend to have a higher average IQ.

6.2.2 THE SCHOOL

Considering the fact that most adolescents spend a large proportion of the day at school, it is suggested that the school could play an important role in helping pupils to adopt healthy eating habits. The school could also help parents and teachers to adopt eating behaviour that will promote health and help them to understand the factors that affect the eating habits of adolescents.

6.2.2.1 A SCHOOL POLICY

The school would have to develop a school-based nutrition education policy and programme that promote healthy eating behaviour. The policy would have to be developed and based on input from pupils, staff, parents, administrators, food service personnel, nurses, counsellors and health professionals. Members representing these vocations would have to assess nutrition needs and issues

peculiar to their community. The policy would have to be adapted to incorporate food preferences from different ethnic and socio-economic groups.

The effectiveness of a school health programme would have to be evaluated frequently and, if the need arose, the programme could be changed appropriately to increase its effectiveness.

6.2.2.2 TUCKSHOP AND VENDING MACHINES

Tuckshop and vending machines on the school property could be used to promote healthier messages. Healthy foods and drinks should be readily available to pupils. For example, soft drinks could be replaced with fruit juices, and a good range of fruit and vegetable products could be provided. The literature study revealed that many parents rely on food supplied by the tuckshop to provide breakfast, lunch and snacks for their children (refer section 2.4.4.4).

6.2.2.3 A SCHOOL BREAKFAST PROGRAMME

The literature study revealed that many adolescents do not eat breakfast and that skipping breakfast can have a negative effect on their health and on their cognitive functioning (refer section 3.4.4). Since breakfast is considered to be the most important meal of the day, and contributes to the nutritional wellbeing of the adolescent with regard to daily nutrient and energy intake, a school breakfast programme could be introduced. Radzikowski and Gale (1984:365) have found this programme to be effective in improving nutrient intake as well as standardised achievement test scores.

6.2.3 TEACHERS

The teacher and his or her teaching methods can have a positive effect on a pupil's eating behaviour and can help an adolescent to develop a positive self-concept. Once a school-based nutrition education policy and programme have

been developed, teachers would have to be trained to implement nutrition education.

Suggested topics for workshops and in-service training programmes for teachers include the following:

- An examination of their own eating behaviour.
- An examination of the characteristics of a healthy diet for male adolescents, female adolescents and adults.
- Identification of the early signs of eating disorders.
- The dangers and causality of eating disorders.
- How to integrate discussion and activities related to nutrition for teachers across different disciplines. For example, in a Maths lesson, pupils could analyse nutrient intake, in an English lesson, pupils could criticise certain adverts and write letters of complaint to the relevant magazine or TV organisations, and in a History or Art lesson, pupils could examine paintings of a period when people were overweight.
- Instructors of sport could help pupils to understand the relationship between nutrition and physical activity. Linking nutrition and physical activity is important because of the rising proportion of overweight adolescents (refer section 2.5.4).
- How to increase an adolescent's awareness of the influence of socio-cultural factors on body image. Adolescents need to be taught how to examine social norms critically, for example, social norms that emphasise slenderness.
- How to help adolescents to understand that physical and physiological changes are normal. Teachers must guard against commenting negatively on a child's physical appearance. Adolescents need to experience the educator as accepting his or her appearance.
- How to demonstrate practical aspects of nutrition to pupils by showing them videos or slide shows on the dangers of eating disorders.

- How to teach a curriculum on nutrition effectively. Various activities can be used by the teacher to reinforce healthy eating habits and will be outlined in section 6.2.3.1

6.2.3.1 Activities for pupils

Teachers can use the following activities to promote healthy eating habits:

- Adolescents could analyse their personal dietary intake and compare it to a recommended healthy diet. They could keep a diary of their own food consumption so that they can see for themselves what they are eating and how it compares to a recommended dietary intake. Allen (1996:343) devised a food pyramid worksheet for pupils to complete (refer to appendix B).
- Useful and meaningful charts could be displayed to create an atmosphere of nutritional awareness. Pupils could assist the teacher in making these aids.
- Use healthy food, for example, wholewheat salad rolls, to reward good behaviour.
- Give pupils opportunities to taste healthy food, including food they have never tasted before.
- Provide incentives such as verbal praise to reinforce positive messages with regard to nutrition. It might be useful to apply Bandura's Theory of Behaviour (refer to section 2.5.3). Behaviour theorists believe that behaviour can be learnt, and teachers could apply these principles. For example, rewarding pupils by praising them or giving them tokens when they demonstrate that they can apply the learnt concept of good nutrition. Examples include
 - allowing pupils to give a presentation on aspects of nutrition
 - awarding a trophy to the pupil with the most effective nutrition awareness campaign at school.

These incentives make children feel that their efforts are recognised and, consequently, they tend to work even harder at following a balanced diet.

- Investigate the sugar / fat / salt content of a range of snack foods. Neil (1994:151) found this activity to be an effective way of promoting pupils' awareness of the high sugar, fat, salt content of snack foods.
- Select food for special events, school camps, etc.
- Plan sport team diets.
- Plan diets focusing on seasonal foods.
- Plan diets focusing on the price of foods.
- Start weight management groups.
- Promote health messages by designing T-shirts and having food fairs.
- Analyse the influence of culture, media, technology and other factors on health. For example, pupils could challenge the media's message that "thinness equals success and beauty".
- Practise goal-setting and decision-making skills to help pupils to promote health. According to Maslow (refer to section 3.5.4) people who believe that they are responsible for their own success are likely to actualise their true potential. Teachers should encourage adolescents to practise goal-setting and decision-making skills to help them realise that they are responsible for their success in achieving good eating behaviour. They could, for example, debate the topic "My ability to cope with puberty lies in my own hands".
- Practise skills to resist negative social pressures. The literature study revealed that adolescents eat junk food because it is fashionable (refer section 2.4.4.2). They also adopt unhealthy eating behaviour in an attempt to achieve an ideal body image (refer section 3.3.1).
- Develop skills in reading food labels. The literature study revealed that adolescents buy food based on the attractiveness as well as the size of the packaging and do not read the food labels (refer section 3.6.3).
- Pupils could investigate interesting careers in Dietetics.
- Investigate how certain famous people maintain good eating habits. An interview with the famous person could reveal details such as their experiences during puberty, the methods they use and what motivates them to maintain good eating habits.

- Discussions or debates could be held on advantages of good eating habits as opposed to disadvantages of unhealthy eating habits. It is important to connect current eating habits with future outcomes.
- How to develop a teaching approach that will help adolescents develop a positive self-concept. The literature study as well as the empirical investigation revealed that adolescents with bad eating habits tend to have a low self-concept. Teachers ought to convince adolescents that they can cope with the changes that take place during adolescence once pupils understand these changes. Pupils need to believe that correct eating during puberty is important and can help them to develop a positive self-concept. One of the reasons for the development of a negative self-concept is the tendency to set goals that are unattainable and, therefore, teachers should encourage pupils to evaluate themselves realistically with regard to their physical appearance and eating behaviour (refer section 3.3.2.).

It is important that the method of teaching arouses the adolescent's interest in eating behaviour. As far as possible, teachers should develop a pragmatic approach, so that pupils can discover the concept of nutrition for themselves. Teachers should try to be innovative and use effective teaching aids in their lessons on nutrition. The activities suggested above would make pupils aware that nutrition is an important and interesting subject.

The EHQA could be used to good effect during Grade 8, in that specific problems could be identified with regard to eating habits. The teacher would then have an opportunity to focus on areas where the pupils experience difficulties.

6.2.4 PARENTS

According to the literature study, the influence of parents is a persistent factor that helps determine a child's eating behaviour. It was found that parenting

styles, parent relationships and the eating behaviour of parents influence their children's eating patterns (refer section 2.4.4).

The educational implication is that educators could involve parents in a nutrition education programme as an effective strategy in changing nutrition behaviour.

Here are some practical guidelines for parents, which could contribute to the improvement of the eating habits of adolescents. Parents or guardians could attend workshops offered by the school. Presentations could be delivered on topics such as:

- Understanding the adolescent child. This topic can be sub-divided into the following:
 - An awareness of physical and physiological changes that take place during adolescence. Parents need to guard against making negative comments in relation to the child's physical and physiological changes during puberty. Parents must be encouraged not to comment continually on the child's physique. This could lead to feelings of anxiety, which could cause the child to overeat or undereat (refer section 3.7). Parents need to offer support and encouragement as their child goes through puberty.
 - The role of parents in the development of a positive self-concept. The literature study as well as the empirical investigation revealed that the self-concept has a tremendous effect on the child's development of eating habits. Parents need to convince their child that puberty is normal and that it can be a positive experience. Adolescents need to feel that they are loved unconditionally, and parents need to help their children to develop confidence in their physical appearance. They can build children's level of confidence by rewarding and praising them for the way they are coping with puberty and for adopting healthy eating behaviour. Children should

be encouraged to praise themselves when they make healthy food choices since this is likely to foster a positive self-concept. Another way in which parents could help in the development of a positive self-concept is by helping the adolescent to develop a sense of self-autonomy. They must be made to trust their own ability to make decisions, such as, healthy food choices. Children could be given the responsibility of choosing between different foods from an early age. The child needs to practise responsible choices with regard to eating correctly. Adolescents need to experience a sense of importance in order to develop a positive self-concept. Parents need to adopt a parenting style that provides adequate opportunities for discussion about adolescence, eating behaviour, peer pressure, and so on.

- The effect of emotions on eating behaviour during adolescence. The empirical investigation revealed that adolescents with bad eating habits tend to be less trusting and more aggressive than adolescents with good eating habits. Adolescents need to experience constancy and security during the changes of puberty, therefore, parents need to think before they bring about further change in their child's life such as moving to a new place or airing marriage conflicts.
- The birth order of the child. The empirical investigation revealed that the eating habits of the middle child seem to be poorer than those of eldest or only children. Parents must be made aware of the general tendency to neglect the middle child and be encouraged to become more involved in their eating behaviour.
- The examination of their own eating behaviour. They could also trace their family tree of appearance.

- Skills on how to develop a healthy eating plan. Parents need to set an example so that the child can gain insight into the importance of eating correctly.
- The importance of an increased availability of fruit and vegetables at home.
- Skills in preparing fruit and vegetables in an appetising manner. Adolescents could be encouraged by parents to replace the eating of junk food with, for example, carrots and a dip while watching television.
- Skills for low-income parents on how to prepare popular, nutritional yet economical foods. Parents can be encouraged to circulate different ethnic recipes.
- The importance of talking to their children about the importance of nutrition and its effect during puberty. Parents need to provide opportunities for discussion about eating habits and puberty. Discussion gives adolescents confidence and a sense of importance.
- How to identify early signs of eating disorders.
- The personality types of adolescents who tend to develop unhealthy eating habits. The literature study revealed that adolescents with bad eating habits tend to have personalities that display characteristics of being excitable, shy, individualistic, or prone to guilt feelings. Parents need to be aware of personality characteristics that may influence the development of unhealthy eating habits.
- The importance of maintaining a warm and caring atmosphere at home.

Parents could play an important role in helping their adolescents adopt a more positive approach to the changes that take place during puberty. They could help their children develop a sense of perseverance and self-reliance. Parents must help adolescents to trust their own ability to choose what they eat. For example, parents could allow children to cook once a week. A sense of self-reliance will help them develop good eating habits as well as a positive self-concept.

6.2.5 AUXILIARY SERVICES

Support services such as those provided by nurses, medical practitioners, nutritional professionals, educational psychologists and the media should be consulted before a truly effective nutrition education programme can be drawn up. Height and weight measurement screenings could be conducted by a nurse who could establish whether the Body Mass Index of a pupil is normal or not (refer section 2.5.4).

Links should be established with nutritional professionals who can provide screening, referral and counselling for nutritional problems. Dieticians could be invited to deliver presentations on healthy eating behaviour.

The following guidelines are proposed to help the educational psychologist to reduce unhealthy eating patterns:

- Challenge the adolescent's beliefs about the consequences of eating a balanced diet. The Rational Emotive Therapy (RET) technique could be used to do this.
- Help adolescents to adopt thinking and behaviours that will enable them to eat properly. Bandura's learning behaviour principles can be implemented to achieve this.
- Help adolescents to develop a routine schedule for eating.
- Help adolescents to develop skills for meal planning.
- Ask adolescents to keep a diary on their thoughts before, during and after a meal.
- Explore the meaning of thinness and fatness with the client.
- Rehearse self-control strategies to be recalled when the adolescent feels the need to overeat or to diet.
- Use role-play to act out tricky social situations. For example, when peers try to pressurise the adolescent into eating junk food.

- Explore alternative behaviour to unhealthy eating behaviour.

The literature study reveals that the media has a profound influence on the eating habits of adolescents (refer sections 2.5.2.2, 2.5.4.1, 3.3.2, 3.5.2 and 3.5.3).

It was found that an image of slimness is promoted in films and commercials (Gerdes 1981:67, Johnson 1987:670, Nichter 1994:109 and Monroe 1996:15). It was also found that the media stimulate adolescents to respond to stimuli such as junk food, which promote unhealthy eating habits (Jablow 1992:94 and Carson 1992:330). Some advertisements link food to role models and influence an adolescent's choice of food (Jacobson 1997:76). Research evidence clearly highlights the high level of the media's influence on adolescents' eating habits.

Nicklas et al (1997:320) found that the media is an effective method used to increase awareness, positive attitudes and knowledge of nutrition.

According to the results of the empirical investigation it was found that many adolescents obtain their information about nutrition from magazines. The results appear in table 6.1 and pie chart 6.2.

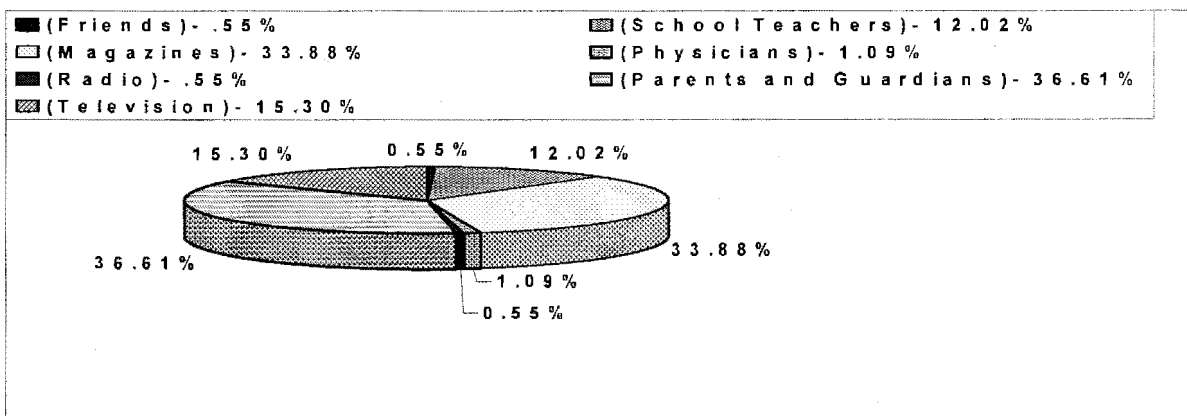
Table 6.1 Media through which adolescents with good eating habits and adolescents with bad eating habits receive information about nutrition.

Variable Obtained information from	Group	N
Television	A	15
	B	13
Parents / Guardians	A	43
	B	24

Table 6.1 Media through which adolescents with good eating habits and adolescents with bad eating habits receive information about nutrition.

Variable Obtained information from	Group	N
Friends	A	1
	B	0
School Teachers	A	16
	B	6
Magazines	A	30
	B	32
Physicians	A	2
	B	0
Radio	A	0
	B	1

6.2 Pie Chart showing the sources from which adolescents receive information on nutrition



To conduct the investigation, the eating habit scores of 183 pupils were used. Group A consisted of 107 pupils with good eating habits and Group B consisted of 76 pupils with bad eating habits.

According to table 6.1 and pie chart 6.2, adolescents obtain most of their information from their parents / guardians and from magazines. Pupils with bad eating habits tend to obtain their information from magazines, whereas pupils with good eating habits tend to obtain their information from parents or guardians.

The educational implications of these results lie in the suggestion that media marketing strategies should be considered to promote health awareness targeting adolescents. Magazines can be used to increase awareness, positive attitudes and knowledge that promote healthy eating behaviour.

Editors of magazines could be asked to provide more information on nutrition and to expose adolescents to a wider range of body shapes and weights.

6.3 EVALUATION OF THE RESEARCH

6.3.1 CONTRIBUTIONS OF THE RESEARCH

The purpose of this study was to measure the eating habits of adolescents, and to determine which factors cause adolescents to manifest unhealthy eating behaviour.

A measuring instrument (EHQA) was developed specifically to measure the eating habits of adolescents since the existing measuring instruments were not entirely relevant.

The EQHA was found to be valid and reliable (0,87). The questionnaire is simple to administer and score. It can be used by both the teacher and the counsellor. The questionnaire can be used to identify the eating habits of adolescents and this provides both the teacher and the counsellor an opportunity to work on improving the eating habits of adolescents.

The sample consisted of pupils from different race groups and, therefore, allows for generalisation of the findings to several race groups.

Insight was needed into the factors that influence the eating behaviour of adolescents and the researcher has provided a better understanding of the nature of the concept "eating habits".

The study identifies concomitants and possible precursors to unhealthy eating behaviour among adolescents.

The investigation verified that factors such as gender, participation in sport, knowledge of nutrition, intellectual ability, order of the child in the family, emotions, self-concept and personality have a significant effect on the eating behaviour of adolescents.

The empirical investigation was further able to disseminate certain valuable information with regard to related questions of whether or not certain factors play a significant role in the development of eating habits. The results revealed that boys tend to have healthier eating habits than girls; adolescents who participate in sport have better eating habits than pupils who do not participate in sport; adolescents who have knowledge of the health risks of eating disorders tend to have healthier eating habits than adolescents who do not have knowledge of the health risks of eating disorders; a middle child tends to have unhealthier eating habits compared to an eldest or only child, adolescents with good eating habits tend to be more trustful than adolescents with bad eating habits, adolescents

with bad eating habits tend to be more aggressive than adolescents with good eating habits; adolescents with good eating habits tend to have a better self-concept with regard to the physical, personal, family and moral-ethical self; adolescents with good eating habits tend to have a phlegmatic temperament, are socially bold and self-assured; adolescents with bad eating habits tend to have an excitable temperament, are shy, show individualism and are prone to guilt feelings.

Educational implications of the findings were discussed in order to provide curriculum developers, schools, teachers, parents, counsellors and the media with guidelines on how to help children to develop healthy eating habits.

6.3.2 PROBLEMATIC ASPECTS OF THE STUDY

Although the investigation provided valuable information, certain limitations are inherent namely:

- (i) One cannot assess the level of honesty with which pupils answered the EHQA.
- (ii) It is difficult to assess whether all students understood all the items correctly. For example, some pupils asked what a calorie was.
- (iii) Some pupils who are conscious of their physical appearance may have experienced anxiety at the time of testing and this may have influenced the results.

6.4 RECOMMENDATIONS FOR FURTHER RESEARCH

Based on the investigation, the following recommendations for further research are made:

- (i) More research with regard to the self-concept and its effect on eating habits could prove to be valuable. The literature study as well as the empirical investigation revealed that the self-concept has a significant effect on eating habits. In order to gain greater insight into the development of the self-concept and eating habits, a longitudinal type of study could prove to be useful. Such a study would allow a person to specifically follow the eating patterns and the development of the self-concept of children.

- (ii) The investigation was conducted using pupils from academic schools. The research could be extended to subjects from technical and special schools as this will allow for generalisation of the findings to other adolescents.

Give me a fish and I will eat today.

Teach me to fish and I will eat for a lifetime.

- Chinese Proverb

APPENDIX A

Eating Habits Questionnaire for Adolescents (EHQA)

AN EATING HABITS QUESTIONNAIRE FOR ADOLESCENTS

SECTION A: BIOLGRAPHICAL INFORMATION

1. SURNAME: _____ INITIALS: _____ DATE: _____
2. ALLOTTED NUMBER: (1 - 3)
3. GRADE: (08 ; 09; 10; 11; 12) (4 - 5)
4. GENDER: MALE = 1
FEMALE = 2 (6)
5. AGE IN YEARS: (EG. 12, 13, 14 ETC.) (7-8)
6. TYPE OF PARENTS:
1 = LIVING WITH BOTH PARENTS
2 = DIVORCED PARENTS - LIVING WITH MOTHER
3 = DIVORCED PARENTS - LIVING WITH FATHER
4 = DIVORCED PARENTS - LIVING WITH
GRANDPARENTS / GUARDIAN (9)
7. BIRTH ORDER:
1 = YOUNGEST
2 = ELDEST
3 = MIDDLE
4 = ONLY CHILD (10)
8. HEIGHT (IN CM. EG.155,6 OR 155,0 ETC.) (11-15)
9. WEIGHT(IN KIOLOGRAMS EG. 080, 090, 100 ETC) (16-18)
10. HEALTH:
1 = POOR
2 = EXCELLENT
3 = MEDIUM (19)
11. PARTICIPATION IN SPORT:
1 = YES
2 = NO (20)

12. PHYSICAL DISABILITIES (EG. EYES, EARS, LIMBS)
 1 = YES
 2 = NO (21)
13. AGGREGATE PERCENTAGE OBTAINED IN NOVEMBER 1999 (22-23)
14. THE NUMBER OF CHILDREN IN YOUR FAMILY (24)
15. PHYSICAL APPEARANCE OF MOTHER
 1 = THIN
 2 = OVERWEIGHT
 3 = NORMAL WEIGHT (25)
16. PHYSICAL APPEARANCE OF FATHER
 1 = THIN
 2 = OVERWEIGHT
 3 = NORMAL WEIGHT (26)
17. ARE YOU A VEGETARIAN? (DO NOT EAT MEAT)
 1 = YES
 2 = NO (27)
18. DO YOU BELONG TO A RELIGION WHERE THE EATING OF CERTAIN FOODS IS FORBIDDEN?
 1 = YES
 2 = NO (28)
19. DO YOU BELONG TO A RELIGION WHERE FASTING IS PRACTICED BY YOU?
 1 = YES
 2 = NO (29)
20. DO YOU HAVE A GOOD RELATIONSHIP WITH YOUR MOTHER?
 1 = YES
 2 = NO (30)
21. DO YOU HAVE A GOOD RELATIONSHIP WITH YOUR FATHER?
 1 = YES
 2 = NO (31)

22. DO YOU KNOW WHAT THE RISKS OF OBESITY ARE?
 1 - YES
 2 = NO (32)
23. DO YOU KNOW WHAT THE DANGERS OF EXCESSIVE DIETING ARE?
 1 = YES
 2 = NO (33)
24. WHAT RACE GROUP DO YOU BELONG TO?
 1 = BLACK
 2 = WHITE
 3 = ASIAN
 4 = OTHER (34)
25. ARE YOU AN ACTIVE PARTICIPANT IN SPORT?
 1 = YES
 2 = NO (35)
26. WHERE DO YOU OBTAIN MOST OF YOUR INFORMATION ABOUT NUTRITION?
 1 = T.V.
 2 = PARENTS / GUARDIANS
 3 = FRIENDS
 4 = SCHOOL TEACHERS
 5 = MAGAZINES
 6 = PHYSICIANS
 7 = RADIO (36)
27. DO YOU THINK THAT LEARNING MORE ABOUT NUTRITION SHOULD BE INTEGRATED INTO THE SCHOOL CURRICULUM?
 1 = YES
 2 = NO (37)
28. WORKING STATUS OF PARENTS.
 1 = BOTH PARENTS WORK
 2 = MOTHER STAYS AT HOME AND FATHER WORKS
 3 = FATHER STAYS AT HOME AND MOTHER WORKS
 4 = NEITHER OF YOUR PARENTS HAVE A JOB (38)

SECTION B:

CONSIDER EACH STATEMENT BELOW AND ANSWER AS HONESTLY AS YOU CAN. INDICATE YOUR PREFERENCE BY MEANS OF THE CODE NUMBER AS INDICATED ON THE SCORE. PLACE THE CODE NUMBER IN THE BLOCK NEXT TO THE STATEMENT.

CODE:

- 1 = ALWAYS
- 2 = USUALLY (OFTEN)
- 3 = RARELY (HARDLY EVER)
- 4 = NEVER

1. WHEN YOU EAT OUT WITH YOUR PARENTS, HOW OFTEN ARE YOU FREE TO CHOOSE WHICH MEAL YOU WANT TO ORDER? (39)
2. HOW OFTEN DO YOU TAKE MINERAL SUPPLEMENTS? (40)
3. HOW OFTEN DO YOU EAT A MEAL WITH YOUR PARENTS? (41)
4. HOW OFTEN DO YOU FEEL TOO EMBARRASSED OF YOUR PHYSIQUE TO PARTICIPATE IN PHYSICAL ACTIVITIES SUCH AS SWIMMING AND ATHLETICS? (42)
5. HOW OFTEN DO YOUR PARENTS DISCUSS THE NUTRITIONAL VALUE OF FOOD WITH YOU? (43)
6. HOW OFTEN DO YOU AVOID PARTICIPATING IN PHYSICAL ACTIVITIES? (44)
7. HOW OFTEN DO YOUR PARENTS BUY TAKE-AWAY FOODS? (45)
8. HOW OFTEN DO YOU ENGAGE IN DIETING BEHAVIOUR? (46)
9. HOW OFTEN DO YOU EAT DIET FOODS? (IE. LOW CALORIE FOOD) (47)
10. HOW OFTEN DO YOU FEEL OBLIGED TO EAT CRISPS, SWEETS, BISCUITS ETC. WHEN OFFERED TO YOU BY YOUR FRIENDS? (48)

11. HOW OFTEN DO YOU BINGE ON FOOD WHEN YOU HAVE NEGATIVE FEELINGS SUCH AS ANGER, FRUSTRATION, SADNESS ETC. (49)
12. HOW OFTEN DO YOU DISCUSS THE NUTRITIONAL VALUE OF FOOD WITH YOUR FRIENDS? (50)
13. HOW OFTEN DO YOU EAT MEALS WHILE WATCHING TELEVISION? (51)
14. HOW OFTEN DO YOU FEEL THAT FOOD CONTROLS YOUR LIFE? (52)
15. HOW OFTEN DO YOU RAID THE KITCHEN FOR SOMETHING TO NIBBLE ON WHEN FOOD IS ADVERTISED ON TELEVISION? (53)
16. HOW OFTEN ARE YOU DISSATISFIED WITH YOUR WEIGHT? (54)
17. HOW OFTEN DO YOU THINK THAT LIFE WOULD BE PERFECT AND HAPPY IF YOU COULD LOOK LIKE THE SLIM MODELS THAT YOU SEE ON TELEVISION? (55)
18. HOW OFTEN DO YOU FEEL THAT YOU GIVE TOO MUCH TIME AND THOUGHT TO FOOD? (56)
19. DO YOU FIND THAT YOU SNACK ON CHIPS, SWEETS ETC. MORE FREQUENTLY WHEN STUDYING FOR TESTS AND EXAMS? (57)
20. IS FOOD AN IMPORTANT FEATURE WHEN YOU GET TOGETHER WITH FRIENDS? (58)
21. HOW OFTEN DO YOU SNACK ON CRISPS, CHOCOLATES ETC. WHEN YOU FEEL BORED? (59)
22. WHEN YOU SEE A NEW KIND OF CHOCOLATE, ICE CREAM, BEVERAGE ETC. ADVERTISED ON TELEVISION DO YOU BUY IT IN ORDER TO TRY IT? (60)
23. HOW OFTEN DO YOU FEEL GUILTY AFTER EATING? (61)

24. HOW OFTEN DO YOU GO TO THE FRIDGE IN SEARCH OF A FIZZY COOL DRINK WHEN YOU SEE A COCA-COLA ADVERT ON TELEVISION? (62)
25. HOW OFTEN DO YOU FEEL YOU MAY NOT BE ABLE TO STOP EATING? (63)
26. HOW OFTEN DO YOU FEEL UNCOMFORTABLE WHEN TELEVISION PROGRAMS AND ADVERTISEMENTS GIVE THE MESSAGE, "THIN IS IN"? (64)
27. HOW OFTEN IS YOUR CHOICE OF FOOD DETERMINED BY BY WHAT YOUR FRIENDS EAT WHEN YOU ARE IN THEIR COMPANY? (65)
28. HOW OFTEN DO YOU TAKE VITAMIN SUPPLEMENTS? (66)
29. HOW OFTEN ARE YOU SECRETIVE ABOUT YOUR EATING HABITS? (67)
30. HOW OFTEN DO YOU AVOID FOODS WITH SUGAR IN THEM? (68)
31. HOW OFTEN ARE YOU WORRIED THAT YOU MAY HAVE AN EATING DISORDER? (69)
32. HOW OFTEN IS YOUR CHOICE OF FOODS INFLUENCED BY YOUR KNOWLEDGE OF A BALANCED DIET? (70)
33. HOW OFTEN DO YOU EAT A HIGH CALORIE DIET WITH EXCESSIVE PROTEIN? (71)
34. HOW OFTEN DO YOU WORRY ABOUT NOT GETTING ENOUGH TO EAT WHEN GOING TO A PARTY? (72)
35. HOW OFTEN DO YOU EAT FOOD WITH A HIGH FAT CONTENT? (73)
36. HOW OFTEN DO YOU FEEL UNCOMFORTABLE WHEN PEOPLE COMMENT ON YOUR WEIGHT? (74)
37. HOW OFTEN DO YOU KNOW THE CALORIE CONTENT OF THE FOODS THAT YOU EAT? (75)

38. HOW OFTEN DO YOU HEAR NEGATIVE MESSAGES IN YOUR HEAD BECAUSE OF YOUR PHYSICAL APPEARANCE? (76)
39. HOW OFTEN DO YOU AVOID FOOD WITH A HIGH CARBOHYDRATE CONTENT (I.E. BREAD, RICE, POTATOES ETC.?) (77)
40. HOW OFTEN DO YOU SPEND TIME WISHING THAT YOU COULD BE THINNER? (78)
41. HOW OFTEN DO YOU KNOW THE SUGAR CONTENT OF THE BEVERAGES THAT YOU DRINK? (79)
42. HOW OFTEN DO YOU EAT SALAD DURING THE DAY? (80)
43. HOW OFTEN ARE YOU ABLE TO IDENTIFY FOODS HIGH IN FAT? (1)
44. HOW OFTEN DO YOU EAT SNACK FOODS SUCH AS CHIPS, BISCUITS, SWEETS ETC. DURING THE DAY? (2)
45. HOW OFTEN ARE YOU AWARE OF THE CHOLESTEROL CONTENT OF FOOD THAT YOU EAT? (3)
46. HOW OFTEN DO YOU EAT FRUIT DURING THE DAY? (4)
47. HOW OFTEN DO YOU KNOW WHICH VITAMINS ARE FOUND IN THE FOOD THAT YOU EAT? (5)
48. HOW OFTEN DO YOU EAT FAST FOODS FROM A CANTEEN OR A RESTAURANT? (6)
49. HOW OFTEN DO YOU SAY NO TO CERTAIN FOODS OR BEVERAGES BECAUSE OF THE NEGATIVE EFFECT THAT THEY MAY HAVE ON YOUR TEETH? (7)
50. HOW OFTEN DO YOU USE CONDIMENTS SUCH AS TOMATO SAUCE, CHUTNEY ETC.? (8)
51. HOW OFTEN DO YOU SKIP BREAKFAST? (9)
52. HOW OFTEN DO YOUR FRIENDS INFLUENCE YOU TO BUY AND / OR TO EAT JUNK FOODS SUCH AS CRISPS, ICE CREAMS, SWEETS, FIZZY COOL DRINKS ETC.? (10)

53. HOW OFTEN DO YOU CHOOSE BETWEEN FOODS ON THE BASIS OF THEIR FIBRE CONTENT? (11)
54. HOW OFTEN DO YOU EAT VEGETABLES DURING THE DAY? (12)
55. HOW OFTEN DO YOU READ THE NUTRITIONAL LABELS ON FOODS? (13)
56. HOW OFTEN DO YOU EAT PROTEIN (MEAT, FISH , CHICKEN ETC.)? (14)
57. DO YOU KNOW WHICH MINERALS ARE FOUND IN THE FOOD THAT YOU EAT? (15)
58. HOW OFTEN IS FRUIT MADE AVAILABLE TO YOU AT HOME? (16)
59. HOW OFTEN DO YOU DRINK FIZZY COOL DRINKS? (17)
60. HOW OFTEN ARE YOU ABLE TO CLASSIFY THE FOOD THAT YOU EAT ACCORDING TO THE FOOD GROUPS: CARBOHYDRATES, LIPIDS, AND PROTEINS? (18)
61. HOW OFTEN DO YOU CONSIDER YOUR INTAKE OF SALT TO BE HIGH? (I.E. YOU ADD SALT TO FOOD THAT HAS BEEN SALTED?) (19)
62. HOW OFTEN DO YOU WORK AT A COMPUTER FOR MORE THAN 3 HOURS DURING THE DAY? (20)
63. HOW OFTEN DO YOU DRINK WATER DURING THE DAY? (21)
64. HOW OFTEN DO YOU EXERCISE AT A GYM AND / OR AT HOME? (22)
65. HOW OFTEN DO YOU USE LAXATIVES TO LOSE WEIGHT? (23)
66. HOW OFTEN DO YOU WATCH TELEVISION FOR MORE THAN 3 HOURS DURING THE DAY? (24)
67. HOW OFTEN DO YOU PARTICIPATE IN PHYSICAL EXTRA-MURAL ACTIVITIES AT SCHOOL? (25)

68. HOW OFTEN DO YOU USE SMOKING TO CONTROL YOUR APPETITE AND WEIGHT? (26)
69. HOW OFTEN DO YOU EXERCISE IN ORDER TO WORK OFF CALORIES RATHER THAN TO STAY FIT? (27)
70. HOW OFTEN DO YOU USE DIET PILLS TO CONTROL YOUR WEIGHT? (28)
71. HOW OFTEN DO YOU VIEW PHYSICAL EXERCISE AS A PLEASURABLE ACTIVITY? (29)
72. HOW OFTEN DO YOUR PARENTS QUESTION YOUR EATING HABITS? (I.E. THEY ARE NOT HAPPY WITH YOUR EATING HABITS) (30)
73. HOW OFTEN DO YOU FEEL THAT THE FOOD PREPARED BY YOUR PARENTS FOR YOU IS NUTRITIONALLY UNBALANCED? (31)
74. HOW OFTEN DO YOU HAVE TO PREPARE YOUR OWN MEALS? (32)
75. HOW OFTEN DO YOU FEEL THAT YOU ARE OVERWEIGHT? (33)
76. HOW OFTEN DO YOU WISH THAT YOU WERE THINNER? (34)
77. HOW OFTEN DO YOU HAVE A NEGATIVE ATTITUDE TOWARDS PEOPLE WHO ARE OBESE? (35)
78. HOW OFTEN DO YOU WEIGH YOURSELF DURING THE WEEK? (36)
79. HOW OFTEN HAS YOUR MOTHER DIETED? (37)
80. HOW OFTEN HAS YOUR FATHER DIETED? (38)
81. HOW OFTEN DO YOU FEEL SCARED OF BECOMING OVERWEIGHT? (39)
82. HOW OFTEN DO YOU FEEL THE REFLEX TO THROW UP AFTER MEALS? (40)

83. HOW OFTEN DO YOU THINK THAT DATING SOMEONE OF THE OPPOSITE SEX IS EXTREMELY IMPORTANT? (41)
84. HOW OFTEN DO YOU THINK THAT SLIMNESS IS AN IMPORTANT FACTOR IN DATING AND POPULARITY WITH THE OPPOSITE SEX? (42)
85. HOW OFTEN DO YOU EAT BETWEEN MEALS? (43)
86. HOW OFTEN DO YOU DO THE GROCERY SHOPPING FOR THE FAMILY? (44)

OFFICE USE ONLY

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(45 - 60)

SENIOR SELF-CONCEPT

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(61 - 74)

H.S.P.Q

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(75 - 80)

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(1 - 14)

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(15 - 22)

I.Q.

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(23 - 25)

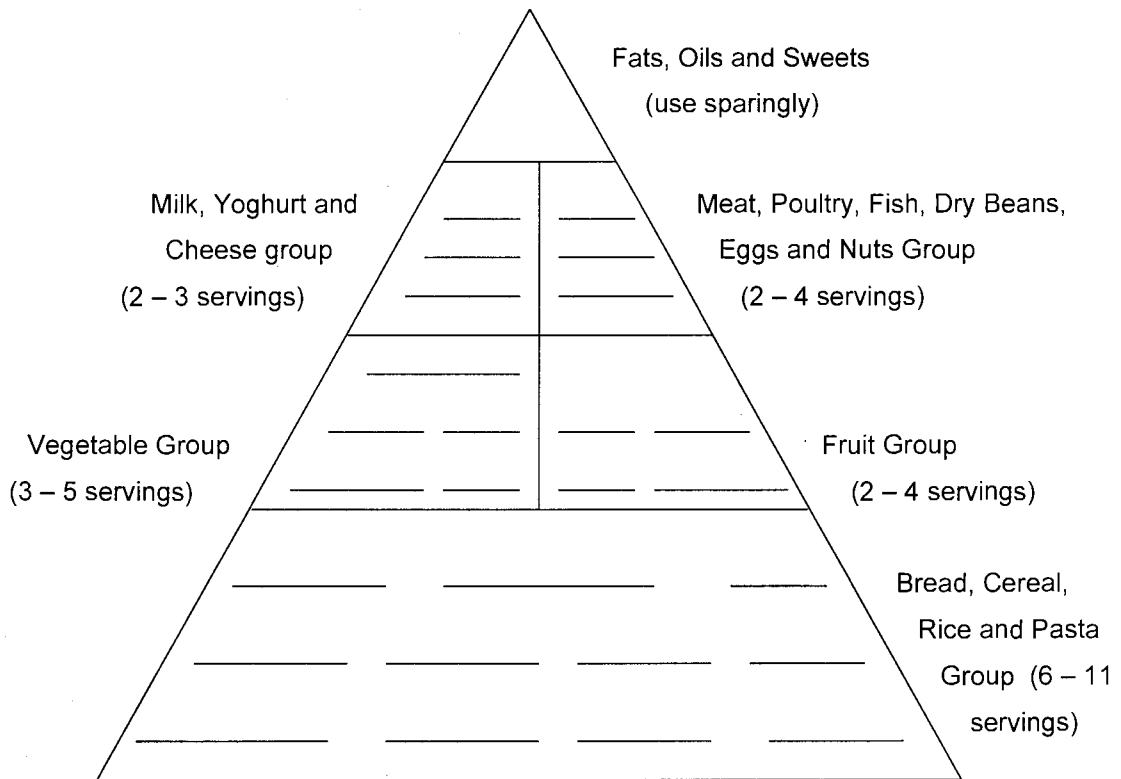
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(26 -)

APPENDIX B

A Food Pyramid Worksheet

Figure 6.1 My Personal Food Pyramid



(Donna Allen 1995)

Students pick one day of their food diary to analyse. Each student chooses a colour and designates this colour to the “breads, grains, rice, cereal and pasta group”. With this same colour, they lightly shade in the bread, cereal, rice and pasta group section on the Personal Food Pyramid worksheet. The student places a dot of this same colour next to each serving of that food on his or her record of food consumption for one day. If for example, the student ate a roast beef sandwich, he or she would have to place two dots by the sandwich because two slices of bread equals two servings of bread.

Using a pencil, students then transfer the names of the dotted items from their food diary onto the shaded area on their personal food pyramid worksheet.

Once they have entered all servings of food for the day onto their personal food pyramid, discussion takes place about the number of servings in a food group as well as the variety and quality of foods. Students are encouraged to compare and contrast pyramids with their peers.

The teacher provides information about the types of foods in each group and the student modifies his or her food choice to make it healthier. Students could compile an example of a balanced food pyramid using foods that they enjoy.

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