ASSESSMENT OF NUTRITIONAL KNOWLEDGE, BEHAVIOUR AND BMI OF PRIMARY CARE – GIVERS WITH CHILDREN UNDER THE AGE OF 18 YEARS

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DECLARATION

I declare that the current study the *Assessment of Nutritional Knowledge, Behaviour and BMI of primary care-givers with children under the age of 18 years* is my own work, that it has not been submitted before for any degree or examination in any university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Melissa Judith Brown November 2011

Signed:.....

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ABSTRACT

Research suggests that parents' feeding practices play a critical role in the development of children's tastes, eating habits, nutrition and eventual weight status. Thus if parental feeding practices play such a critical role, the question arises as to whether there is a difference in parental feeding practices that determine different developments in children's nutritional habits. Furthermore, feeding practices are possibly based on the nutritional knowledge of parents. The aim of this study was to assess the Body Mass Index (BMI), nutritional knowledge and behaviour of primary care-givers. This study followed the quantitative research paradigm. A sample of 147 staff members, who were primary care- givers of children at a University in the Western Cape was self-selected to participate in the study. Only primary care-givers of children were invited to participate. The primary care-givers were asked to complete two online questionnaires, the Comprehensive Child Feeding Questionnaire (CFPQ) developed by Musher-E-Eisenman and Holub (2007), and the General Nutritional Knowledge Questionnaire (GNKQ) for adults. Data analysis was done by means of the Statistical Package for Social Sciences (SPSS 17). Results indicated that the majority of participants were overweight (46% of the participants). Primary care-givers across all body mass index groups did not lack nutritional knowledge but variations in behaviour were found with regard to feeding practices. However similarities were found in the BMI categories in the areas of teaching about nutrition, pressure to eat at meal times and encouraging balance and variety.

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CHAPTER 1

INTRODUCTION

1.1 Background/Rationale

In the ever-changing field of nutrition and diet therapy, there continues to be an increase in the incidence of certain diseases such as cardiovascular diseases, cancer and diabetes, although literature suggests that diets high in saturated fats, fast foods and additives are causing these diseases (Ventura & Birch, 2008). Globally the incidence of overweight children has increased dramatically, particularly amongst young girls (Birch & Fisher, 2000). Thus, if there is information regarding these links between nutrition and health, as well as an increase in weight concerns of children, a concern would be whether primary care-givers have nutritional knowledge and engage in nutritional practices which are advantageous to the health of their children. This concern is based on the fact that primary care-givers often provide both the genes and environmental context for young children's growth and development.

The general public selects their foods from hundreds or even thousands of products, many of which are designed and marketed to maximize their appeal to the consumer. In order to select a healthy diet, the public must be able to ignore the advertisers' blandishments and the immediate appeal to the palate, and draw on a complex, technical and scientific knowledge-base concerning nutrients, foods and health (Paramenter, Waller, & Wardel, 2000). At a minimum, they need to know the prevailing nutritional recommendations, be able to apply those to the food products which they are considering consuming and combine recommendations in order to make the best food choices (Paramenter, et al., 2000). Primary care–givers play a role in shaping the

development of children's food acceptance. Food acceptance is done by determining which foods are offered to children and by providing the social contexts in which children eat (Galloway, Fiorio, Francis, & Birch, 2006). Often, primary care-givers are the ones who affirm the nutritional knowledge their children will be carrying later in their lives (Paramenter, et al., 1999). In the early foundational phases of a child's life, issues of obesity need to be dealt with by looking at the example provided by the primary care-giver (O'Brian, 2007).

Obesity, a complex condition, with serious social and psychological dimensions, affects virtually all age and socio-economic groups and threatens to overwhelm both developed and developing countries (WHO, 1990). Foremost are obese parents, who are more likely to have obese children (Cutting, Fisher, Grimm-Thomas & Birch, 1999). Obesity is measured worldwide by an increase in Body Mass Index (BMI) greater than 25 (Mahan & Escott-Strump, 2004). According to the World Health Organization (2010), an estimated 200 million obese adults worldwide and another 18 million under-five year old children were classified as overweight in 1995 (Du Plessis, Calber, McAlister, Sabanegh & Agarwal, 2010). As of 2000, the number of obese adults has increased to over 300 million (Du Plessis, et al., 2010). Studies related to obesity indicate that children of obese parents are more likely to be overweight themselves (Cutting, et al., Birch, et al., 2000; Bouchard, Savard, Depres, Trembley, & Leblanc, 1985; Dehghan**,** Danesh**,** & Merchant, 2005; Guilame, Lapidus, Beckers, Lamber, & Bjorntorp, 1995). Thus, one has to view different family models when taking into account what food choices are being made.

Wardle, Parmenter & Waller, (2000) state that primary care-givers' influence is thought to be strongest when they act as providers, enforcers and role models to children who are young. During this developmental period food choices are also applied. This leaves one to question what nutritional knowledge and feeding practices primary care-givers use to teach their children about

good and bad nutrition styles? Are parents aware that they affirm for their children the nutritional knowledge that these children will be holding later in their lives? Thus, the purpose of the current study was to assess the BMI scores (indicated by low and high scores), as well as the nutritional knowledge and behaviour (indicated by eating and feeding practices) of primary care-givers with children under the age of 18 years.

1.2 Theoretical Framework

The Social Learning Theory was used as the theoretical framework to understand this study. Social Learning Theory can be considered as a bridge or a transition between behaviourist learning theories and cognitive learning theories. According to this theory, human behaviour is explained in terms of continuous reciprocal interaction between cognitive, behavioural and environmental influences (Omrad, 1999). This theory is used as a theoretical framework for the current study as it allows for an understanding of the depiction of primary care-givers' and children's modelled behaviour. Bandura (1977) theorized that people learn through observing others' behaviour, attitudes, and outcomes of those behaviours. Most human behaviour is learned observationally through modelling. When an individual observes others, an idea is formed of how new behaviours are performed, internalization of this information occurs, and on later occasions this coded information serves as a guide for action (Bandura, 1977). For example, hostile thoughts can result in hostile behaviour, which can affect our environment by making others hostile, evoking additional hostile thoughts (Omrad, 1999). Similarly, unhealthy food ideas by the primary care-givers could result in unhealthy food choices for primary care-givers and their families. This theory is further discussed in Chapter 2 of the thesis.

1.3 Problem Statement

Nutrition plays a vital role in the life-cycle of a child and correct food choices mean that all the nutritional needs are met (Stedman, 2000 & Mahan & Escott-Strump, 2004). Obesity in children is on the increase and its increase must mean that food choices are based on likes and dislikes of the child who is being presented with food choices (Birch & Fisher, 1998). Parents, being primary care-givers, shape the development of children's food acceptance patterns by determining what foods are offered to children and provide the social contexts in which children eat (Birch & Fisher, 1998). Lessons learnt at mealtime may influence dietary patterns and weight status throughout the lifespan of children. Little is known about parents' socialization of their children's eating in the mealtime environment (Orrel-Valente, Hill, Breechwald, Dodge & Bates, 2007). International research studies (Cutting, et al., 1999; Bonchard, et al., 1985; Dehghan, et al., 2005; Guilame, et al., 1995; James, 2006) dating from as far back as 1985 provide vast amounts of information concerning children, parents and care-givers as well as information about the effects of food in their environments. One needs to view research over a period of time in relation to feeding practices as it would provide a background as to the tendencies of primary care-givers to provide the food environment for their children. South Africa's *own* empirical information on the subject remains almost non-existent. As a possible first study of its kind in South Africa, this study assessed the knowledge of nutrition and behaviour (eating and feeding practices) of primary care-givers of children under the age of 18 years in relation to their BMI scores (low and high scores). Specifically, this study compared primary care-givers' nutritional knowledge and behaviour across high and low BMI scores.

1.4 Research Questions

The following research questions were developed:

1. Would primary care-givers with high BMI scores differ in their nutritional knowledge from that of primary care-givers with low BMI scores?

2. Would primary care-givers with high BMI scores differ in their behaviour from that of primary care-givers with low BMI scores?

3. Would the nutritional knowledge of primary care-givers be related to their behaviour?

1.5 Aims and Objectives

1.5.1 Aims of the study

The aim of the study was to assess and compare nutritional knowledge, behaviour (indicated by eating and feeding practices) and BMI scores (low and high scores) of primary care-givers with children under the age of 18.

1.5.2 Objectives of the study

The objectives of the study were to:

- determine the nutritional knowledge and behaviour (indicated by eating and feeding practices) of primary care-givers with children under the age of 18,

- determine the BMI (low and high) scores of primary care-givers with children under the age of 18,

- compare the nutritional knowledge and behaviour (indicated by eating and feeding practices) of primary care-givers with low and high BMI scores.

1.5.3 Hypotheses

The objectives form the basis on which the following broad hypotheses can be made as a guide to this study:

1. There is a significant difference in nutritional knowledge and feeding practices between low and high BMI scores of primary care-givers.
2. Primary care-givers allow their children more personal choice in choice of foods.
3. Primary care-givers with high and low BMI scores significantly differ in their feeding practices.

1.6 Research methodology

This study used a quantitative research paradigm. The quantitative research methodological approach produces statistical outcomes and tries to prove or disprove hypotheses for resultant relationships between the variables of the study (Bless, Higson-Smith & Kagee, 2006). The non-experimental research design, more specifically the correlational type was employed within the current study. McMillan and Schumacher (2006), describe correlational research as assessing relationships between two or more phenomena, which links to the aims of the research study of investigating a relationship between primary care-givers' nutritional knowledge, behaviour and BMI scores. The study was also cross-sectional in terms of the time dimension, because several

factors were assessed at the same time (Babbie & Mouton, 2007). Variables within the study were that of BMI, knowledge, as well as behaviour.

1.7 Significance of the study

The research examined the nutritional knowledge, behaviour (indicated by eating and feeding practices) and BMI (low and high scores) of primary care-givers and the shared nutritional practices with their children under the age of 18 years. Carper, Fisher, and Birch (1999) state that rigid and controlling approaches to child feeding may impede the development of self-control by the child with reference to food intake. Additionally, it is more that the adult prompts the child to eat, increasing the likelihood that children will eat, but override their own fullness as a guide to terminate eating (Carper et al., 1999). This leads to an increased BMI in the child. The resultant information in this study is important with regard to informing parents of the role they play in children's eating choices, weight and general health. The study would allow primary care-givers to question their motives for the introduction of certain foods in their children's diet. Due to the fact that food is central to our sense of identity, one needs to evaluate the introduction of certain foods in the child's diet. Therefore this study is of importance to new parents or parents who are at the starting point of creating food identity for their children. Additionally, the results will add to the current information available in terms of parenting affecting children's eating and weight status in South Africa, as well as children's preferences and food availability related to primary care-givers' preferences. Adding to the limited research and knowledge of this area of research would be important for further focus.

We find that in South Africa, we are spoilt for choice as consumers in the food market as it provides us with the pleasure of being able to select food from hundreds or even thousands of

products on the market. Primary care-givers thus need to see beyond large advertisement campaigns in order to select foods which are healthy both for themselves as well as for their families. The information would also allow researchers to see whether the nutritional recommendations which are published regularly in many countries (Cannon, 1992; WHO, 2009), together with public information aimed at helping people to understand the links which have been established between diet and disease (WHO, 1990) are being understood. The information would help parents to form a link between nutrition knowledge and feeding of their children. It would clarify for them that they are the knowledge base and first point of reference. In same way this would decrease obesity trends amongst primary care - givers children.

This study would allow for an evaluation of the nutritional knowledge and BMI of academic staff members at an academic institution. Such people would be exposed to current research, psychological behaviour mechanisms which are explored in research, teaching and learning theory. They would be well read and/or interested in current global trends as well as be able to effectively understand and interpret advertising techniques used. Research finds that parental feeding practices can be related to children's eating behaviours (Birch & Davison, 2001).

1.8 Operational Definitions

Body Mass Index (BMI)

Comparisons among various weight-for-height indices for both adults and children have led to the selection of Body Mass Index (BMI; kg/m2) as most desirable. A definition of weight status based on height and weight is desirable, because these measures can be obtained with reasonable precision in a variety of settings including field studies, clinical practice, and research (Musher-E-Eisenman & Holub, 2007).

Feeding practices

These are not easily defined but are highlighted by particular habits. There are five compensatory feeding practices which exist; pressurizing a child to eat, restricting access to certain foods, use of high calorie supplements, use of appetite stimulants and use of added sugar sweeteners (Birch & Fisher, 1998).

Nutrition

Nutrition is the study of the food and liquid requirements of human beings for normal physiological function, including energy, need, maintenance, growth, activity, reproduction, and lactation (Stedman's Medical Dictionary, 2000).

Nutritional knowledge

Nutritional knowledge relates to habits involving regular eating patterns and vegetable intake (Haycraft & Blissett, 2008).

Primary care-giver

A primary care-giver is a person who primarily tends to the needs of an infant or child (Corsini, 2002).

1.9 Overview of chapters

Chapter 2 presents the conceptual framework of the study. It focuses on nutritional knowledge, as well as the eating and feeding behaviour of the primary care-giver. In particular, it provides an understanding of primary care-givers' behaviours, which children then learn or interpret in the context of Social Learning Theory.

Chapter 3 focuses on the method of conducting the research. Here specific attention is given to how the study was conducted, based upon the aims and objectives of the study, hypotheses, the sample of participants, questionnaires used, data collection and analysis procedures, as well as the ethical considerations.

Chapter 4 is a presentation of the results of the study in tables, following the analysis outlined in chapter 3.

Chapter 5 concludes the study with a discussion of the main findings integrated with previous research and the Social Learning Theory presented in chapter 2. Limitations of the study are provided and the chapter is concluded with recommendations for further study.

CHAPTER 2

CONCEPTUAL FRAMEWORK

2.1 Introduction

In 2005, 1.6 billion adults were overweight and 400 million were obese. At least 20 million children under the age of 5 years were overweight globally in 2005 (WHO, 2005). According to the World Health Organization (WHO, 2008; 2009), an estimated 43 million children who are under five years of age will be overweight by the end of 2010, with 2.3 billion overweight adults in the world by 2015 and more than 700 million of them will be obese. Globally the incidence of overweight children has increased dramatically, particularly amongst young girls (Birch & Fisher, 2000), even though there is literature to support that diets high in saturated fats, fast foods and food additives are causing diseases such as heart disease, diabetes, cancer and learning difficulties (Ventura & Birch, 2008). The concern is that with so much available information, being overweight or obese should be decreasing and more especially with children. The focus of this chapter is to use the Social Learning Theory as a platform to understand the nutritional knowledge and behaviour patterns of primary care-givers.

2.2 Social Learning Theory

Bandura (1977) formulated and theorized that people learn through observing others' behaviours, attitudes, and outcomes of those behaviours. Bandura (1977) explored behaviorism, by specifically emphasizing experimental methods, focusing on variables which can be observed, measured and manipulated, and avoided whatever variables were subjective, internal and unavailable, such as the mind. He found that in the experimental method, the standard procedure

was to manipulate one variable, and then measure its effects on another. All this culminates in a theory of personality that states that one's environment causes one's behaviour. Bandura (1977) however believed that this approach was too simplistic and he took it a step further. He suggested that the environment causes behaviour, but behaviour causes environment as well. He labelled this concept as *reciprocal determinism* meaning that the world and a person's behaviour are the result of each other (Bandura, 1986). In understanding reciprocal determinism Bandura (1977: 79) emphasised that,

> Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action.

In other words, when an individual observes others, an idea is formed of how new behaviours are performed, the individual then internalizes this information and on later occasions this coded information serves as a guide for action (Bandura, 1977). An example of this is when a child in a family observes older siblings demanding sweets by exploding into a tantrum in order to get what they want. The observing child would then mimic this behaviour in order to have the same benefit and reward. Bandura (1977) believed aggression reinforced by family members was the most prominent source of behaviour modeling. He reported that children use the same aggressive tactics that their parents illustrate when dealing with others (Bandura, 1977). In relation to the current study, an example would be when children are told they are not able to watch television while eating, but needing to do one thing at a time. Feeding practices of parents in households differ, where one parent would allow the child to watch television and eat at the same time. The child may either eat more or less during this time depending on their ability to multi-task (Webber, Hill, Cooke, Carnell, Wardle, 2010).

2.3 Principles of Social Learning Theory

There are three main principles which are central to Social Learning Theory (Bandura, 1977: 85). These principles are:

The highest level of observational learning is achieved by first organizing and rehearsing the modelled behaviour symbolically and then enacting it overtly. An example of this principle is children who are able to recognize the labels of various fast food brands, carbonated drinks and chocolate bars. These children then behave in a certain way as they are aware that their parents will not give in to their demands without the children having an emotional outburst. This principle suggests that coding modelled behaviour into words, labels or images results in better retention than simply observing.

Individuals are more likely to adopt a modelled behaviour if it results in outcomes they value. The child will be achieving the desired outcome of the food or beverage he or she wants to eat instead of the one which is provided by the primary care-giver. Individuals are more likely to adopt a modelled behaviour if the model is similar to the observer, for example family members such as older siblings who get what they ask for with begging or nagging, and has admired status and the behaviour has functional value. The functional value of a behaviour would be the end result of the child gaining what he or she wants, for example an extension on television time, not wanting to eat vegetables, wanting to use lunch money to buy their own preferred meal and snack or wanting to have more freedom from their primary care-givers with not much self-regulation. Rosenstock, Strecher & Becker (1988) state that individuals who value the perceived effects of changed lifestyles or incentives will attempt to change if they believe that (a) their current lifestyles pose threats to any personally valued outcomes, such as health or appearance

(environmental cues); (b) that particular behavioural changes will reduce the threats (outcome expectations); and (c) that they are personally capable of adopting the new behaviours. Children who are amongst friends who are socially outgoing, read fashion magazines or watch television shows which promote body consciousness, may view their primary care-giver as being overweight or obese. This makes them question whether or not they want to develop that same tendency, so they refuse to eat certain foods or develop body dysmorphic conditions.

Bandura (1977) found that humans are able to control their behaviour through a process known as self-regulation. This process involves three steps: Firstly, *self-observation* - Humans look at themselves and their behaviour and keep track of their actions. Self-observation requires that the person or individual keeps close tabs on their behaviour, both before and after they begin changes. This self-observation can involve something as simple as counting how many cigarettes one smokes in a day to complex behavioural diaries. With the diary approach, the individual keeps track of the details, the 'when and where' of the habit. This allows the individual to understand what kinds of cues are associated with the habit by posing certain questions, for example: Do you eat fried food every night or quick microwave meals and feed them to your children? Do you eat thick slices of bread with thin slices of cheese, or thin slices of cheese with thick slices of bread? Secondly, *judgment* - Humans compare these observations with standards. These standards can be rules set by society, or standards that the individual sets for him or herself (Bandura, 1986). The individual arranges to reward themselves when they adhere to their plan, and possibly punish themselves when they do not. These contracts should be written down and witnessed (by a therapist, for example), and the details should be spelled out very explicitly: "I will go out to dinner on Saturday night if I smoke fewer cigarettes this week than last week. I will do paperwork instead if I do not" (Bandura, 1986:75). Finally, *self- response* - If, after

judging him or herself, the person does well in comparison with the set standards, he or she will give him or herself a rewarding self-response. If the person does poorly he or she then administers a punishing self-response to him or herself. As the individual starts implementing what they have as evidence from their behavioural charts and diaries, they can begin to alter their environment. For example, some of the cues that lead to bad behaviours can be removed or avoided: put away the ashtrays, drink tea instead of coffee, divorce that smoking partner. One can find the time and place best suited for the good alternative behaviours: When and where do you find you study best? (Bandura, 1986). All of these examples have some influence on effective modelling.

2.4 Conditions for effective modelling

Necessary conditions exist for effective modelling. These conditions include attention, retention, reproduction and motivation. In *attention*, various factors increase or decrease the amount of attention paid. For example, primary care-givers who pressurize or demand a child to eat would use a tone that could be perceived as brusque, rude and bullying (Orrel-Valente, et al., 2007). On the one hand the behaviour of the feeder, often the primary care-giver, is that of scolding, threatening and yelling at the child to eat such as, "*When I say eat, you eat!*" On the other hand, the feeder could try to rationalize to get the child to eat but the choice is the child's, for example: "*Want to try the beans? I made them the way you like them*". These prompts all influence the attention paid by the child during the mealtime. Sensory capacities, arousal level, perceptual set, past reinforcement are characteristics which affect attention (Allen & Santrock, 1993). This kind of sensory arousal can be brought about at the table by food preparation styles which care-givers use to attract the attention of children. *Retention* includes remembering what was attended to. In

order to reproduce the modelled behaviour, the individual must code the information into long-term memory. Therefore, the information will be retrieved at a later time.

Modelling has been shown to be a highly effective means of establishing abstract or rule-governed behaviour (Bandura, 1986). Bandura (1986) further states, that on the basis of modelled information, people acquire judgmental standards, linguistic rules, styles of inquiry, information-processing skills and standards of self-evaluation. For example, a simple verbal description of what the model (in the case of this study the primary care-giver) performed would be known as retention (Allen & Santrock, 1993). Retention includes symbolic coding, mental images, cognitive organization, symbolic rehearsal and motor rehearsal. In the context of the study, an example would be the primary care-givers' ability to remember what he or she deems as healthy from previous exposure to health related media material. *Reproducing* the attended and retained image includes physical capabilities and self-observation of reproduction. An example of motor reproduction would be to be able to learn how to ski or ride a bicycle or, in the case of early childhood, the use of a knife and fork at mealtimes, or the ability to replicate the cooking of a meal. Once a behaviour is learned through attention and retention, the observer must process the physical capabilities (Allen & Santrock, 1993). Examples of such physical capabilities would be the use of muscles for being able to perform the task, remembering that some foods are fatty and that if you eat them you need to exercise. In *motivation*, the individual has a good reason to imitate behaviour. This motivation includes motives which include promised and imagined incentives and vicarious - seeing and recalling the reinforced model (Bandura, 1977). Thus in the context of this study, Social Learning Theory offers an understanding of how children attend, retain and model the behaviour of primary care-givers during meal preparation time and feeding time. As Social Learning Theory suggests, the

behaviour which is attended and retained will be modelled at a later stage in the human lifespan. Children learn behaviours from their primary care-giver, due to the fact that the model, (for the purpose of this study being the primary care-giver) is similar to the observer – the child, has admired status, the behaviour having a functional value. Children learn behaviours through both experiencing the consequences of their own behaviour and through the development of expectations of consequences by observing others incurring the reinforcement/punishment for their behaviours. This conditioning results in behavioural patterns that are continuously developed and shaped over the course of the child's life. Behavioural modeling is more important during the establishment of new behaviours, while operant conditioning becomes more relevant during the maintenance and shaping of these new behaviours. Children are more likely to learn behavioural patterns from those individuals who control the majority of the rewards and punishments and establish the social contexts in which behaviours are learned and established (Jeor, Perumean-Chaney, Sigman–Grant, Williams & Foreyt, 2002).

2.5 Nutrition

Nutrition is seen as the study of food and liquid requirements of human beings for normal physiological functioning which includes energy, need, maintenance, growth, activity, reproduction and lactation (Stedman, 2000). The term nutrition can be seen as an umbrella term encompassing the sub-term of nutrients. Nutrients are defined as a constituent of food necessary for normal physiological functioning, with essential nutrients being defined as nutritional substances for optimal health. These nutritional substances must be in the diet, because they are not formed or metabolized within the body (Stedmans 2000). For nutritional substances to be available to the body at any time, Nicklaus, (2008) states that eating a variety of foods is essential to achieve adequate levels of macro-and micronutrient needs. Additional to the concept

of nutrition, there are nutritional dimensions of eating food. These dimensions also contribute to the psychological dimension of eating. Since variety, both within and between meals, contributes to the pleasure of eating, there is a need to explore the background of primary care-givers' nutritional knowledge.

As primary care-givers, nutritional knowledge means that they need to come to terms with the psychological dimension of eating, the social aspect of eating and having to translate this to their children. An example would be sitting around the table and sharing with family a meal that was cooked and prepared by the primary care–giver. This includes primary care-givers being able to ensure that eating for pleasure is not just encouraging foods which are high in fat and sugar content, but also foods which provide the nutritional substances for optimal health (Bisogni, Connors, Devine & Sobal., 2002). Examples are primary care-givers who provide many different colours and variety of fruits on a plate for their children, or allowing their children to experiment in cooking a meal which is made from scratch that includes a lot of vegetables, protein and starch.

2.5.1 Knowledge of nutrition

Knowledge is defined as certain or clear apprehension of truth or fact, cognition, the familiarity gained by actual experience (Stedmans, 2000). In the field of nutrition, nutritional knowledge is defined as habits involving regular eating patterns and vegetable intake (Haycraft & Blissett, 2008). Both the regular eating patterns and vegetable intake are important for providing optimal nutritional substances for optimal health (Nicklaus, 2008). Studies which focused on the correlations between nutritional knowledge and dietary behaviour however failed to reach statistical significance (Wardle et al., 2000). Thus, a critique of these studies suggests that the

correlation between nutritional knowledge and food choice and the value of nutrition education campaigns may not necessarily be relevant (Wardel et al., 2005). Therefore the focus has been placed on the relevance of nutritional knowledge of the parent which leads to food preparation methods and not just on eating patterns. Wardle, et al., (2000) believe that there are several reasons to think that the significance of knowledge, as one of the determinants of food choice, may have been underestimated. If one has a clear comprehension of truth, fact or cognition this is knowledge.

The full detail of the nutritional knowledge gained needs to be examined to establish if it is of sound factual base. Some researchers however, such as Bisogni et al., (2002), state that pronouncing knowledge about diet and well-being is of little relevance to food selection and choice. Therefore if one were to simply change knowledge, it is unlikely to have a desired effect on eating patterns, thus meaning that if you teach a parent to eat healthily this may not lead to affecting his or her eating patterns differently (Haycraft & Blissett, 2008). For example primary care – givers with eating disorders showed that a simple knowledge change, such as being aware of what is healthy or unhealthy in relation to fats in the diet, did not mean that their eating behaviour would change.

Cooper & Whelan (2000) found that primary care-givers with eating disorders were also much more intrusive during mealtime as well as playtimes of their children. The primary care-givers with eating disorders were also more likely to present their children for treatment, if they suspected a similar eating disorder, once again showing knowledge of what should be correct eating behaviour. However, this knowledge did not change their own personal eating patterns based on their diagnosed eating disorder (Cooper & Whelan, 2000). This meant that if in the current study primary care-givers who were underweight were asked to participate they would

have a good knowledge base for what good nutrition is. However, a compilation of studies over a period of time have failed to find a strong association between nutrition knowledge and food intake (Shepherd & Stockley, 1987; Shepherd & Towler, 1992; Stafleu, Van Staveren, De Graaf, & Burema, 1996; Spruijt – Metz, Lindquist, Birch, Fisher & Goran, 2002). If nutritional knowledge is estimated with unreliable instruments, then the power of the study to detect associations with other variables is correspondingly reduced (Wardle et al., 2000).

Wardle, et al., (2000) found that nutritional knowledge was shown to be a partial mediator of the socio-economic variation in intake, especially for fruit and vegetables, this making knowledge significantly associated with healthy eating. It was found that participants in the Wardle et al., (2000) study, who were in the highest quintile for knowledge, were almost twenty five times more likely to meet the current recommendations for fruit, vegetable and fat intake. Focus needs to be placed on eating practices of both parents and children as evidence indicates that child-feeding practices have the potential to affect children's energy balance via altering patterns of intake that potentiate the preferences for high-fat, energy-dense foods, and limit their acceptance of a variety of foods at mealtimes (Birch & Fisher, 1998).

2.6 Nutritional behavioural patterns of primary care-givers

Primary care-givers' nutritional behaviour stems from lifestyle behaviours related to food consumption and physical activity, both of which are important causes of unhealthy weight gain in children (American Academy of Pediatrics, 2003). In understanding behavioural patterns of primary care-givers, primary care-givers may not initiate preventive changes of their own diets and children's diets unless they first perceive that their child is at risk for some adverse outcome (Young-Hyman, Herman, Scott, & Schlundt, 2000). Thus, what are the nutritional knowledge and

feeding practices primary care-givers are using to teach their children about good and bad nutrition styles? Primary care-givers shape the development of children's food acceptance by determining what foods are offered to children and by providing the social contexts in which children eat (Galloway, Fiorio, Francis, & Birch 2006).

Ventura & Birch (2008), state that research differences exist for the terms "parenting style" and "parenting practices". Both these terms are related yet distinct and have differing influences and implications of interacting for child outcomes. Developmental psychologists define the concept of parenting style as a typology of attitudes and behaviours that characterize how primary care-givers will interact with a child across domains of parenting (Grolnick, 2003). Wardle, et al., (2005) state that primary care-givers' influence is thought to be strongest in early childhood, when they act as providers, enforcers and role models. During this time food choices are also applied. Jeor et al., (2002) state that it is widely accepted that parental behaviours and practices shape many aspects of children's development. To date, there is substantial causal evidence that parenting affects child eating. Furthermore, there is correlated evidence that child eating and weight are influenced by parents (Ventura & Birch, 2008).

A conceptual model for the influence of primary care-givers on children's eating and weight was constructed by Ventura and Birch, (2008). They reviewed sixty-seven studies. Forty-nine of these studies addressed only one pathway, being parenting and child weight. Fourteen studies addressed the two pathways of parenting affecting child weight and child weight affecting child eating. Only four of the sixty seven studies addressed all three pathways. The most critical question raised during this study was, "How does parenting influence a child's weight?" (Ventura & Birch, 2008). In the study it was found that the conceptual model has two implications, these being the possibility of child eating or child weight influencing parenting, where researchers are

currently assigning that specifically the primary care-giver is influencing the child. Ventura & Birch, (2008) argue that logically, primary care-givers cannot have a direct effect on child weight, but rather that primary care-givers influence child weight directly through genetics. However, the argument is expanded to take into account that the influence of primary care-giving on child weight must be mediated by effects of parenting on child eating (or other child behaviours).

In the case of children's eating and energy balance, a few studies have shown that parents' diet history, eating concerns and child-feeding practices influence the development of children's eating behaviours and weight outcomes (Webber, Hill, Cooke, Carnell, Wardle, 2010). Evidence from Bisogni et al, (2002) however indicates that environmental conditions may play an even more powerful role in determining a child's food intake. This could be the amount of food served, the amount of prompting by a primary care-giver and the availability of snacks in the absence of hunger (Mrdjenovic & Letvitsky, 2005).

Although a larger body of research has assessed the direct genetic links between parent and child weight status, relatively little research has assessed the extent to which parents (particularly those who are overweight) select environments that promote being overweight among their children (Birch, & Davison, 2001). Children's height, weight, and/or BMI have been found to relate to parents' self-reported feeding practices, with studies demonstrating that less reported pressure to eat applied to heavier children, and greater reported pressure to eat applied to children with a lower BMI (Haycraft & Blisset, 2008).

2.6.1 Body Mass Index (BMI) and obesity

Obesity in adults is defined as a medical condition in which excess body fat, or white adipose tissue, accumulates in the body to the extent that this accumulation of fat might adversely affect health. An individual can also be defined as being overweight if the BMI is 25-30kg/m² and, obese if their BMI exceeds 30kg/m² (Fahad et. al., 2007). The selected percentile probably reflects Western populations adequately but lacks representation from other parts of the world (Burniat, Cole, Lissau, & Poskitt, 2002). Obesity is a concern due to its multi-factorial disease pattern, as well as the dramatic increase in the numbers of obese adults since 2000 (WHO, 2008). In 2005 the WHO stated that approximately 1.6 billion adults were classified as being overweight and 400 million adults were classified as being obese (WHO, 2008). Predictions by statisticians are that by 2015, approximately 2.3 billion adults will be overweight and 700 million will be obese (WHO, 2009). It has been widely noted that obese people are often blamed for laziness and lack of self-control. However the role of parents has received less scholarly attention (Kokkonen, 2009).

Obesity is defined relative to a selected percentile of a reference population based on age, sex, race-ethnicity, or other group characteristics. For epidemiologic application, the 95th percentile of the BMI is used to define as obese in children (Birch & Davison, 2001). Obesity studies indicate that children of obese parents are more likely to be obese themselves (Robinson et al., 2001; Webber et al., 2010). A number of eating patterns among pre-school aged children have been associated with being overweight. Fruit juice (100% pure) and sweetened fruit drinks have been receiving attention as potential sources of high energy. These beverages have been related to the prevalence of obesity among young children (O'Connor, et al., 2006). We know that obesity runs in families, with children of obese parents at greater risk of developing obesity than

children of thin parents (Birch & Fisher, 2000). An enormous amount of learning about food and eating occurs during the transition from exclusive milk diets of infancy to the omnivore's diet consumed by early childhood. The early learning is constrained by children's genetic predisposition, which includes the unlearned preference for sweet tastes, salty tastes, and the rejection of sour and bitter tastes (Birch & Fisher, 2000). The interaction of genes and environment influences phenotypes (physical and biochemical characteristics) for intake and expenditure and suggests that a renewed focus on the family environment may provide information about behavioural factors that contribute to familial aggregation of adiposity (Birch, et al., 2009). The family environment is seen as the contextual environment where the primary care-giver is central. This allows the primary care-giver to be given key focus in the intervention aimed at treating weight related problems (Robinson et al., 2001).

2.6.2 Eating behavioural patterns of the primary care- giver

The way any human group eats helps assert its diversity, hierarchy and organization, giving food the centre piece of our sense of identity (Mintz & Bios, 2003). Furthermore, food is central to individual identity, due to the fact that any given human individual is constructed, biologically, psychologically and socially by the food he/she chooses to incorporate. In the study of the anthropology of food two different dimensions of the human relationship to food are suggested. The *first* dimension of the human relationship is that of biological to cultural and nutritional function to the symbolic function, for example, biological processes of procreation which need nourishment for the formation of a fertilized egg. The transition which is then fulfilled is now foetus to childhood with the influence of primary care-givers through cultural practices, food preparation and food choices. The *second* dimension of the human relationship links the individual to the collective, the psychological to the social (Mintz & Bois, 2003). For example,

we find that people like to socialize when eating, using various occasions of celebrations and allowing food to be seminal not just as a biological need (Ochs & Merav, 2006).

Food choice is also determined by economic forces (Bisogni, et al., 2002). McNaughton, Ball, Crawford, Mishra, 2007 suggest that increasingly, whole foods (rather than nutrients), their combination in complex eating patterns and their potential synergistic effects are being recognised as important in the prevention of chronic disease.

The use of food has long been recognized as a means whereby an individual assigns identity to him or herself and others (Ventura & Birch, 2008) through what is considered edible, types of food liked and disliked, and the methods of preparation by the individual (Peterson & Lupton, 1996). In Western countries the body has become the marker for personal and social identity, with a healthy and fit body being equated with self-control, self-denial and willpower when dealing with food and mealtimes (Ventura & Birch, 2008). Additionally, parenting styles have also been linked to having an influence on feeding behaviour (Ventura & Birch, 2002).

In gaining an understanding of the food behaviour of people, one needs to understand mealtime and meal preparation. For many individuals meals are social events, and companions affect both the choice and quantity of food consumed for adults and children (Herman, et al, 2003). It has been found that Americans eat more with their spouses, relatives and friends than when alone, thus food consumption which would be based on behaviour exercised at the table increases with group size (Haycraft & Blissett, 2008). Therefore the larger the group, the more individuals within this group tend to consume. Haycraft & Blissett, (2008) found that children aged between 6-10 years consumed more pizza while playing video games with other children than while playing alone.

Several factors may mediate the effects of companions on ingestion, including the effect and arousal elicited by social interaction and distractions reducing the silence of satiety cues. These satiety cues are important for those who are conscious of their body image. Young, et al., (2009) state that in North America, perceptions of people are influenced by what they are supposedly eating. In particular, women are deemed more attractive and more feminine when portrayed as eating fewer calories. Men too are believed to be distracted from the portion sizes they consume. Salvy, et al., (2007) found that men, not women ate more with a same-sex friend than with a stranger. The sex difference in intake disappeared when the subjects were with their romantic partners. Women, but not men ate significantly less when with opposite sex strangers than with their romantic partners. This means that one has to view how food is consumed by looking at feeding practices of individuals.

2.6.3 Feeding behavioural practices

In viewing families and patterns of observation when taking into account what food choices are being made, central to families and patterns of observation is feeding practices (Birch & Fisher, 1998). Feeding practices are not easily defined but are highlighted by particular habits. There are five compensatory feeding practices which exist. These are pressurizing a child to eat, restricting access to certain foods, use of high calorie supplements, use of appetite stimulants and the use of added sugar sweeteners (Birch & Fisher, 1998). Primary care-givers' feeding decisions affect all types of foods made available to children as well as to which extent children have control over what and how much they consume (Birch, et al., 2000). Primary care-givers play a pivotal role in the development of their child's food preferences and energy intake (Birch & Fisher, 1998).

One has to examine families and patterns of observation when taking into account what food choices are being made. Feeding practices are not easily defined but are highlighted by particular habits. Primary care-givers' feeding decisions affect all types of foods made available to children as well as to which extent children have control over the food type and how much they consume (Birch, Fisher, & Grimm-Thomas, 2000). Development research indicates that certain child feeding practices, such as exerting excessive control over what and how much children eat, may contribute to a child being overweight (Johnson & Birch,1994). Overly controlling feeding practices can unintentionally contribute to a child being overweight by disrupting the child's autonomy regarding feeding and eating (Birch, et al., 1998). Research has begun to address what drives primary care-givers' feeding practices and why they implement the strategies they do (Haycraft & Blissett, 2008). Orrel-Valente, et al., (2007) recently conducted an extensive study examining the structure of children's mealtimes and the strategies which primary care-givers employ in an attempt to get their children to eat. The key finding in the research was that the primary aim of primary care-givers was to get their children to eat more. Restrictions of children's food intake can be carried out fairly covertly by parents for example, limiting children's unhealthy food intake by not purchasing unhealthy snacks at supermarkets.

In contrast parental strategies to control children's eating behaviours may also be related to children's energy intake and/or weight (Faith, Scanlon, Birch, Francis, & Sherry, 2004). In a study by Faith, et al., (2004) the focus was on the interactions of the primary care-givers' behaviour regarding food and their food choices and how it relates to their children within the household. This was different from Johannsen, et al., (2006), who reported that mothers exert a strong influence over their children's weight and seem to be more concerned about their children's eating behaviours. The above highlights two focus areas for understanding certain

aspects of the behaviour and concerns of primary care-givers, one being the food choice behaviour and the other being weight concerns. Up to now, research has tended to focus on mothers and their feeding practices, with fathers receiving little attention (Haycraft & Blisset, 2008). Johannsen, et al., (2006), however did find that fathers who reported more controlling feeding practices with daughters, showed the daughters as having a higher percentage of fat. These same fathers were also concerned with their daughters' future health during this study. More mealtime pressure was observed in parents with a higher BMI (Haycraft & Blissett, 2008). Fathers were highlighted as placing more pressure on children to eat and restrictions were associated with more controlling of the child's food choice at the mealtime (Haycraft & Blissett, 2008).

In some cases, although siblings in the same household may eat from the same refrigerator and at the same table, children's experiences with food and eating are generally of the non-shared variety, shaped in part by the child-feeding practices that they experience (Birch & Fisher, 2000). Robinson, Thomas, Kierman, Matheson, Haydel, 2001 reported that parents used different kinds of prompts for eating with overweight and normal-weight children. These researchers stated that most of the counselling in healthcare targeted at children's nutrition is delivered via the parents, but little is known about the effect of such counselling on the nutrition knowledge and dietary habits of the parents. The researchers have also found that the current social and physical environment that children encounter at home and school is often counterproductive to promoting healthy eating and physically active lifestyles (Richter, Harris, Paine-Andrews, Fawcett, Schmid, Lankenau, Johnston, 2000).

2.7 Conclusion

This chapter draws on many factors which contribute to the increase of the nutritional knowledge and feeding practices which primary care-givers are using to teach their children about good and bad nutrition concepts. These would stem from primary care-givers' food practices and the behaviour which is used in sharing those food practices with their children in a modelling environment, as well as understanding what kind of parents' behaviour is used in order to get the desired outcome from the child/children. There is however evidence to suggest that many factors influence children's dietary decisions which lead to obesity in adulthood as well as other weight related disorders. The following chapter will focus on the methodology of the research.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter focuses on the method of how the research was conducted. The quantitative approach in this chapter has used various instruments in order to gain the necessary required data. Included in this chapter are the hypotheses, sample, measuring instruments, data collection and analyses procedures, SPSS descriptive analyses of the data and ethical considerations.

3.2 Research design

Methodology is concerned with how we come to know (Babbie & Mouton, 2001). Research methodology is the theory of correct scientific decisions (Mouton & Marais, 1988). This is done by way of quantitative research which is to determine how certain variables relate to each other in a given population (Babbie & Mouton, 2001). The quantitative research methodological approach produces statistical outcomes and attempts to prove or disprove hypotheses for resultant relationships between the variables of the study (Bless, Higson-Smith & Kagee, 2006). This study used a cross-sectional design in order to describe and compare the data between groups with different BMI scores. As a cross-sectional study, in terms of the time dimension, several factors were assessed at the same time (Babbie & Mouton, 2007). Variables within the study were the BMI, knowledge as well as the behaviour of primary care-givers.

3.3 Population and Sampling

A sample was drawn from a population of 1309 staff members at a university in the Western Cape. The participants in this study included both professional and non-professional staff members employed at the university. As many of the staff members were academic and had lecturing as well as administrative responsibilities, it was practical to have an e-mail request sent to all professional and non-professional staff who had indicated whether they are primary care-givers of children under the age of 18. As a result of the low return rate of questionnaires during the pilot study, a decision was made to resend the invitation of participation in the study to the whole population group again. The returned number of completed questionnaires was 147, which varied from members of staff with basic education of a matriculation certificate to those who had PhD's. The sample also drew on all races within the population of the staff of the University, along with no preference of age – as long as the participant was a primary care-giver and part of the staff of the University

3.4. Research Instruments

The research instruments used were The Comprehensive Child Feeding Practice Questionnaire (CFPQ) and the General Nutritional Knowledge questionnaire for adults (GNKQ). The CFPQ developed by Musher-E-Eisenman & Holub (2007), was used and suggested twelve factors which indicate different feeding practices of children. The primary care-givers needed to have basic nutritional knowledge in order to indicate either healthy or unhealthy feeding practices which they have.

The twelve factors included:

1. **Child control:** *parents allow the child control of his/her eating behaviours and parent-child feeding interactions;*
2. **Emotion regulation:** *parents' use of food to regulate the child's emotional states*;
3. **Encourage balance and variety:** *parents promote well-balanced food intake, including the consumption of varied foods and healthy food choices*;
4. **Environment:** *parents make healthy foods available in the home*;
5. **Food as reward:** *parents use food as a reward for child behaviour*;
6. **Involvement:** *parents encourage child's involvement in meal planning and preparation;*
7. **Modelling:** *parents actively demonstrate healthy eating for the child;*
8. **Monitoring:** *parents keep track of child's intake of less healthy foods*;
9. **Pressure:** *parents pressurize the child to consume more food at meals*;
10. **Restriction for Health:** *parents control the child's food intake with the purpose of limiting less healthy foods and sweets*;
11. **Restriction for weight control:** *parents control the child's food intake with the purpose of decreasing or maintaining the child's weight;*
12. **Teaching about nutrition:** *parents use explicit didactic techniques to encourage the consumption of health foods.*

The first 6 Factors of the CFPQ are as follows:

1. **Child control:** *parents allow the child control of his/her eating behaviours and parent-child feeding interactions;*

2. **Emotion regulation:** *parents' use of food to regulate the child's emotional states;*

3. **Encourage balance and variety:** *parents promote well-balanced food intake, including the consumption of varied foods and healthy food choices;*

4. **Environment:** *parents make healthy foods available in the home;*

5. **Food as reward:** *parents use food as a reward for child behaviour;*

6. **Involvement:** *parents encourage the child's involvement in meal planning and preparation.*

A Likert scale used to improve the levels of measurement in social research through the use of standardized response categories in survey questionnaires to determine the relative intensity of different items (Babbie & Mouton, 2007) was used in the questionnaire. Participants had to respond on a 5-point Likert scale ranging from 1 = Never to 5 = Always. Alpha co-efficients for the CFPQ range between 0.64 and 0.86.

Nutritional knowledge of participants was assessed based on the General Nutritional Knowledge questionnaire for adults (GNKQ) (Parmenter & Wardle, 1999). The questionnaire covered current dietary recommendations, sources of nutrients, everyday food choices and diet-disease relationships. This helped highlight the behaviour of participants with regards to their food choices as it underlined the main aspects relating to knowledge about dietary behaviour. These aspects are as follows: *Do people know what current expert dietary recommendations are? Do they know which foods provide the nutrients referred to in the recommendations? Can they choose between different foods to identify the healthiest ones? Do they know what the health implications of eating or failing to eat particular foods are?* This represented a comprehensive

assessment of nutrition knowledge. In addition questions were asked. Examples of these questions are: *Choose which fat according to experts is most important for people to cut down on: mono-unsaturated fat, poly-unsaturated fat, saturated fat and not sure. How many servings of fruit and vegetables a day do you think experts are advising people to eat: 1, 2, 3, 4, 5 or more servings?*

Participants had to respond to this questionnaire using a 3 point or 4 point Likert scale ranging from 1 = No to 3 = Yes ,1 = Same to 4 = Not sure or ticking the box which they find appropriate. Alpha co-efficient for the GNKQ ranged between 0.70 and 0.97.

The instrument was then reformatted by a software developer in order to be uploaded onto a data server. A feature was also added and written into the program by the software developer which allowed for the participants' BMI to be calculated once they clicked ‘submit’. It was done in a basic programming format which allowed participants to access the information, read the consent form and accept the terms of the consent form by clicking in a tick box. The tick box served as a means of an electronic signature. After ticking the acceptance of the consent form they were allowed access to the three part questionnaire form. On the first page the participants needed to enter data in a section marked “biographical questions” in order to establish their age, height, weight, level of education as well as how many children the participants had. Following this they moved onto sections B and C where they needed to click the appropriate tick box which matched their answer to the questions. On completion of the questionnaire, the participants were able to click “submit” which then allowed the completed questionnaire to be saved. Further to this, the BMI of the participant was calculated by using the weight and height provided by the participant and saved on a remote computer server through Web-Africa for analysis at a later stage.

3.4.1 Administration of Instrument

The Quality Assurance office was accessed at the university where the study was conducted in order to retrieve the required statistical information about the potential participants for this study. An e-mail notification was sent to all Deans and Heads of Department (HOD's) informing them of the intention to do the online survey which would need their staff members to take 10 – 15 minutes to complete. Once confirmation was received from Deans and HOD's an e-mail was then sent to all 1309 academic and non-academic staff members requesting them to access the following website: http://www.melincaclinic.co.za/surveyform.php. Participants were asked to complete an online questionnaire at http://www.melincaclinic.co.za/surveyform.php providing information about their nutritional knowledge and feeding practices prescribed for their children or those they may supervise at feeding times. The questionnaires were accessed online and the participants submitted their completed questionnaire. The participants needed to complete a biographical questionnaire, followed by The Comprehensive Child Feeding Practice Questionnaire (CFPQ) and the General Nutritional Knowledge questionnaire for adults (GNKQ). Instructions on how to access the website as well as the steps to follow if their internet connection did not allow it were provided in the e-mail. Those staff members who fulfilled the criteria of being primary care-givers to children under the age of 18 were asked to click a tick-box which then led to the various survey questions. Once they had completed the questionnaire they needed to click "submit". The final sample size was 150 staff members who completed the questionnaire. However from the 150 completed questionnaires 3 were invalid and could not be used.

3.5 Data Collection

3.5.1 Pilot Study

The purpose of the pilot study is to test reliability of the instrument, test the language and to explore the feasibility of the data collection process. Terreblanche, Durrheim, & Painter, (1999: 94) state that pilot studies are preliminary studies on small samples that help to identify potential problems with the design, particularly the research instruments. The questionnaire and research process were either to be maintained or modified once the data was selected. The reliability of the questionnaires was applied using the Cronbach Alpha, which is a test reliability technique that requires only a single test administration to provide a unique estimate of the reliability for a given test (Gliem, et. al., 2003).

Data for both the pilot as well as the research study was collected by means of an online website created for the purposes of the online survey. The survey request form was sent to participants and blind copied in order for the participants to be anonymous throughout the data collection process. The website was structured to accommodate the biographical questionnaire and no identification of the participants was requested. The questions in the questionnaire were answered in the form of a Likert scale.

Permission was sought from the office of Higher Degrees to conduct the study. The Deans and Heads of Department were asked for permission to gain access to participants within their respective faculties and departments. Ninety professional and non-professional staff members who were primary care-givers of children under the age of 18 were asked via electronic mail to

voluntarily participate in the pilot study, of which fifty completed the online questionnaire. An e-mail was sent to all ninety professional and non-professional staff within the Community and Health Science (CHS) faculty. This made it easier for the researcher, who was part of the CHS faculty to interact with those who matched the criteria and who could remind them to access the questionnaire. The link was provided in the e-mail to access the online survey website if they met the research criteria of being both primary care-givers as well as having children under the age of 18. In accessing the website, the participants then needed to agree to participate by clicking on a consent page. The page then opened up to allow the participants access to the questionnaire questions. The BMI of the participant was then calculated from the data he/she provided. The presence of the researcher during this time was done either by telephone, e-mail or via Google chat in case the participants needed any assistance with clarity or completing the questionnaire. The questionnaires were therefore self-administered and completion of the questionnaire took approximately 15 minutes. Once the pilot study data was collected and the results were satisfactorily verified by the assistance of a statistician at Statistics South Africa, changes were made to the questionnaire. The Americanisation of words (spelling) or phrases used in the questionnaire which led to misinterpretation of the pilot group, layout, font size, numbering used in the questionnaire were changed.

3.5.2 Results of the pilot study

A great challenge of the pilot study was that of staff participation, whether due to time on filling out the questionnaire, not meeting the criteria or the email addresses on the University data base being inactive due to staff no longer being affiliated with the University. A challenge experienced was that participants entered their height in metres as opposed to centimetres as requested. Consequently the online version of the questionnaire had to be adjusted so that

participants could only enter their height in metres. They included the correction of data entry for height being that the participants were not able to enter their height in centimetres with a decimal point as that resulted in participants' height being converted to 2 and therefore caused the BMI to be calculated incorrectly.

3.5.3 Reliability and validity

The purpose of the pilot study was to test reliability of the instrument, test the language and to explore the feasibility of the data collection process. Babbie and Mouton (2001) describe reliability as a particular technique, applied repeatedly to the same object, yielding the same result each time. The reliability of the questionnaire was also assessed by means of a Cronbach Alpha. The questionnaires were assessed by the initial developers of the questionnaires for both validity and reliability. Since there was not a need to change the items in the questionnaire, the same format applied as well as the established validation.

3.6 Data Collection of Main Study

The main data collected in the study was collected in the same way as the pilot study after the changes were effected. Participants were e-mailed again about the corrections. This e-mail was sent to the participants of the pilot study as well as the participants of the sample. Some of the pilot study participants had expressed via email to the researcher that they would like to see the final product, but not, however to participate again in providing data. Upon completion of the questionnaire, the data was then automatically submitted to a centralized database. The first challenge encountered was that some staff members were out of office or were no longer at the university. The second challenge was receiving e-mails from staff members indicating that they did not fit the profile of primary care-giver with children under 18 and that they did not want

their e-mail box filling up with requests to complete the questionnaire. The biggest challenge in assessing the sample was the willingness of staff members to complete the survey in totality and not have incompleted questionnaires being submitted, as staff either were no longer interested in continuing or found it not to be relevant to them.

3.7 Data Analysis

The questionnaires were electronically scored according to the requirements of the instruments. All the data collected was entered into the Statistical Package for Social Science (SPSS18). The data was analyzed in terms of coding, cleaning, frequencies, correlations, and chi-square test. Correlations were used to establish if relationships between variables such as weight, educational status, race which were in the biographical questionnaire were significant, positive and negative. Dependant tests were used to compare nutritional knowledge and behaviour amongst obese and non-obese parents. Those who participated in the study who had a BMI greater than 25 were considered obese. Those participants who had a BMI of 18-25 were then considered non-obese. Participants who scored a BMI less than 18 were considered to be underweight (Birch & Davison, 2001).

3.8 Ethical considerations

Permission to perform the current research study was sought from the Senate Higher Degrees Committee, Deans of Faculties and Heads of Department. *Informed consent* was sought from the participants by asking them whether they accepted participation in the study. If they did, they were asked to indicate their acceptance by ticking the “accept” box as a means of an electronic signature. Participants were assured of their *confidentiality, anonymity* and their *voluntary participation* in the study as no identification was sought during the biographical questionnaire

completion. As the researcher and supervisor had sole access to the data collected, a coding system was used to ensure anonymity of participants. Data could only be accessed by means of a password. Participants were assured that they were able to leave the study any time during the data collection process in the email which was sent to them. However every effort was made to prevent any participant feeling uncomfortable or labelled within the study due to their physicality. This was done by immediate follow-up with participants who emailed the researcher to express concern – about the food choices in the questionnaires and what their answers meant from a nutritional parenting point of view. The researcher had to clarify to them that no names were provided so it was not possible to link their responses with the questions they were raising, but it was possible to provide a guide as to what healthy food choices meant in relation to food group choices and where changes could be made in the family diet. A list of support services was compiled and made available by email. In the event any of the participants felt that they were inadvertently emotionally affected during any part of the data collection phase. These support services included the different supportive facilities at the university which are available to all.

3.9 Conclusion

This chapter which focuses on the research design reflects that a correlational as well as a cross-sectional design was used to achieve the aims and objectives of the study. Information regarding the sample, the research instruments, the data collection process and the data analysis of the study are included in the chapter. Irrespective that it was an online questionnaire, ethical considerations were still taken into account during the processes of data collection and data analysis as no names were entered into the biographical section of the questionnaire in order to

ensure full protection of participants with regard to confidentiality and anonymity. The next chapter presents the results of the analysis.

CHAPTER 4

FINDINGS

4.1 Introduction

This chapter provides the results of the statistical analysis conducted for the study. The chapter's results are represented as (1) descriptive information about child feeding practices and nutritional knowledge and (2) relational characteristics between nutritional knowledge and BMI.

The following is a guide to abbreviations used in the analysis of the data:

Abbreviation	Variable
CFPQ	Comprehensive Child Feeding Practice Questionnaire
GNKQ	General Nutritional Knowledge Questionnaire for adults
BMI	Body Mass Index

4.2 An overview of the analyses

The following hypotheses evolved from the aims and objectives of the study.

Hypothesis 1: Primary care-givers with high and low BMI scores differ in nutritional knowledge. This hypothesis was tested by an independent t-test.

Hypothesis 2: Primary care-givers allow their children more personal choice in food by encouraging balance and variety in their choice of food. Frequencies were used to describe the results of this hypothesis.

Hypothesis 3: Primary care-givers with high and low BMI scores significantly differ in their feeding practices. This hypothesis was tested by a MANOVA

4.3 Internal consistencies of measures

The instruments used in the study were The Comprehensive Child Feeding Practice Questionnaire (CFPQ) developed by Musher-E-Eisenman, and Holub (2007), and the nutritional knowledge of participants was assessed based on the General Nutritional Knowledge Questionnaire for adults (GNKQ) (Parmenter et. al., 1999)

The reliability of the questionnaires was applied using the Cronbach Alpha, which is a test reliability technique that requires only a single test administration to provide a unique estimate of the reliability for a given test (Gliem, et. al., 2003).

Table 4.1 illustrates the Cronbach alpha co-efficients of comprehensive child feeding practice.

Table 4.1 Cronbach alpha co-efficients of comprehensive child feeding

Factors	n (items)	Alpha
Child control	5	.69
Emotional regulation	3	.78
Encourage balance and variety	4	.81
Environment	4	.74
Food as reward	3	.80
Involvement	3	.76
Modelling	4	.87
Monitoring	4	.95
Pressure	4	.75
Restriction for health	4	.86
Restriction for weight control	8	.81
Teaching about nutrition	3	.62

Child feeding questionnaire maximum score = 160

According to Anastasi (1982), Cronbach Alpha coefficients above .7 are deemed to be acceptable.

The Comprehensive Child Feeding Practice Questionnaire (CFPQ) developed by Musher-E-Eisenman and Holub (2007), was used and suggested twelve factors which indicate different feeding practices of children. Participants had to respond on a 5-point Likert scale ranging from 1 = Never to 5 = Always. Alpha co-efficients for the CFPQ for this study ranged between .74 and .95.

4.4 Description of the study sample

Table 4.2 provides an overview of the demographic variables of primary care-givers with children under the age of 18. The demographic variables include height, weight, the number of children, race, and the highest level of education each primary care-giver has.

Table 4.2 Demographic variables of primary care-givers with children under the age of 18

Variables	Total Sample n =147 M (SD)
Average weight of participants **M (SD)**	70. 54 (11.12)
Average height of participants **M (SD)**	162 (14.97)
Average number of children **M (SD)**	2.14 (1.02)
Race	
	N **(%)**
Black	13 (8.8%)
Coloured	91 (61.9%)
White	37 (25.2%)
Asian	6 (4.1%)
Education	
Grade 6	1 0.7%
Grade 7	1 0.7%
Grade 8	2 1.4%
Grade 10	1 0.7%
Grade 12	33 22.4%
National Diploma	22 15%
Bachelors Degree	27 18.4%
Honours Degree	9 6.1%
Masters Degree	34 21.8%
PhD	17 13%

The results in Table 4.2 indicate that the majority of participants had a high level of education, this being at Masters level [34 (21.8%)]. The majority of participants were Coloured (61.9%). The average height of the participants was 162 m while the average weight was 70.54 kg.

Table 4.3 provides the BMI categories of the primary care-givers. This table also evaluates objective 2 of the study: to determine the BMI (low and high) scores of primary care-givers with children under the age of 18.

Table 4.3 BMI categories of primary care-givers

BMI categories	N = 147 (%)
Normal weight	55 (37%)
Overweight	68 (46. %)
Obese	24 (16%)

The results of the BMI scores suggest that the majority of the participants were over the normal weight. As Table 4.3 suggests, the majority of the participants were in the category of overweight [68 (46%)] with an additional 24 (16%) participants being in the category of obese. Thirty-seven percent (37%) of the participants were considered to be in the normal weight category [55 (37%)].

4.4 Nutritional knowledge of the dietary recommendations

This section describes the general knowledge of the participants according to the dietary recommendations, food groups and food choices. Additionally, participants' knowledge according to these factors was also compared across BMI scores, which had been categorised into normal, overweight and obese. The results are presented in a very discursive format for this section since there were too many tables to place in the report of the study and have been placed as appendices. Thus only the main points are highlighted. This section provides descriptive statistics for part of objective 1 of the study: to determine the nutritional knowledge of primary care-givers with children under the age of 18. Descriptive information and comparisons

are presented by means of frequencies. This section also compares the BMI groups according to their nutritional knowledge which thus evaluates part of objective 3 of the study: to compare the nutritional knowledge of primary care-givers with low and high BMI scores. .

4.4.1 Dietary recommendations

The participants were asked: *Do you think health experts recommend that people should be eating more, the same amount, or less of the following foods:* v*egetables, **s**ugary foods (sweets, chocolates) meat, **s**tarchy foods (potatoes, rice), fatty foods (hamburgers, fried chips), high fibre and fruit?*

Table 4.4 presents the participants' responses to the dietary recommendations.

Table 4.4: Dietary recommendations of primary care-givers

Dietary recommendations	Total sample n = 147 (%)	Normal weight n = 55 (37%)	Overweight n = 68 (46%)	Obese n = 24 (16%)
More fruit	140 (95%)	53 (96.4 %)	65 (95.6 %)	20 (83.3 %)
Less sugar in the diet	119 (81%)	43 (78.2%)	58 (85.35%)	18 (75%)
Less salt in the diet	118 (80.3)	45 (81.8%)	56 (82.4%)	17 (70.8%)

Results indicate that 140 (95%) of the participants knew that they needed to consume more fruit with 56 [38.1%] of the participants selecting five fruit and vegetable servings for the day. The majority of participants (118 [81%]) were aware that one needs to have less sugar in the diet with a similar number of participants knowing that a decrease in the amount of salty foods is recommended. Furthermore, participants understood that they needed to decrease unhealthy fat *(mono-unsaturated, polyunsaturated, saturated)* in their diets (78 [53.1%]). The results suggest that all three categories of weight are above 80% in understanding that one needs to increase the amount of fruit in the daily diet with the normal weight group being 53(96.4%), the overweight group being 65(95.6%) and the obese group being 20 (83.3 %). Participants in all three BMI

categories scored above 50% selecting the saturated fat option. The results show that the participants with normal weight were 35(63.6%), overweight were 34(50%) and obese were 9(37.5%). All three categories of weight selected above 50% for low fat versions of dairy as being a healthy choice.

4.4.2 Food groups

In the section of food groups, participants were questioned about their knowledge regarding the food they were consuming according to the food groups such as starchy foods, as well as whether the foods were low or high in fat, sugar and salt content.

Table 4.5 presents the participants' responses to the choices of food groups.

Table 4.5: Choices of food groups of primary care-givers

Food groups	Total sample n = 147 (%)	Normal weight n = 55 (37%)	Overweight n = 68 (46%)	Obese n = 24 (16%)
Ice-cream high in added sugar	136 (93.8%)	51 (94.4%)	65 (95.6%)	20 (87.0%)
Low fat spread being low in fat	106 (72.6%)	38 (69.1%)	52 (76.5%)	16 (69.9%)

A total of 136 (93.8%) of the participants selected ice–cream as being high in added sugar. However 106 (72.1%) participants selected low fat spread as being low in fat. Fifty-two (76%) of the overweight participants selected low fat spread as a low fat food. The obese group (16 [66.7%]) as well as the normal weight group (38 [69.1%]) also selected the low fat spread as being a low fat food. The majority (73 [49.6%]) selected that nuts were high in fat. However, the majority of the normal weight group selected nuts to be low in fat (29[52.7%]), (98[66.7%]) selected nuts to be low in starch. The questions regarding fibre were answered with 102 (72.8%) of the participants selecting fish being in the low range while broccoli was selected as being in the high range, with only 9(5.4%) being unsure. The questions pertaining to foods which were high or low in fat had 116 (78.9%) of the participants correctly selecting olive oil as being low in saturated fat. Bread being high or low in fat, was selected as being low in fat by all three BMI groups. A minor difference in percentage of participants was noticed in selecting a high (68 [46.3%]) or low (64 [43.5%]) category for sunflower margarine. Results showed that overweight participants were in disagreement with some foods containing more fat but no cholesterol with 26 (38.2%) of the 68 participants disagreeing. However 27.3% of the normal weight participants were not sure. Eighty-four (57.1%) of the participants agreed that a glass of unsweetened fruit juice counts as a helping of fruit.

4.4.3 Everyday food choices

Participants were asked to respond to questions with regard to everyday food choices such as the choice of a meal or their understanding of reducing the salt intake in the diet.

Table 4.6 presents the participants' responses to the everyday food choices.

Table 4.6: Everyday food choices of primary care-givers

Everyday food choices	Total sample n = 147 (%)	Normal weight n = 55 (37%)	Overweight n = 68 (46%)	Obese n = 24 (16%)
Mushroom omelette reduces salt intake	74 (50.3%)	26 (47.3%)	34 (50%)	14 (58.3%)
Stir-fry with soy sauce reduces salt in the diet	50 (34.0%)	20 (36.4%)	23 (33.8%)	7 (29.2%)
Healthiest pudding option – baked apple	72 (49.0%)	28 (50.9%)	33 (48.5%)	11 (45.8%)

The majority of participants (74 [50.3%]) selected the mushroom omelette as the best choice in order to reduce salt in their diet. In each BMI category the majority selected the mushroom omelette. However 23 (33.8%) selected the stir-fry with soy sauce as the best option to reduce salt in their diet. The normal weight group had 29 (52.7%) participants who selected two thin slices of bread with a thick slice of cheese as a healthy sandwich. While 72 (49%) of all participants selected the baked apple as the healthiest pudding option.

Table 4.7 shows primary care-givers' knowledge of antioxidants. Table 4.8 shows primary care-givers' knowledge of specific antioxidants.

Table 4.7: Primary care-givers' knowledge of antioxidants

Variables	**Yes**	**No**	**Not sure**

N = 147	(%)	(%)	(%)
Normal weight	37 (63.7)	6 (10.9)	12 (21.8)
Overweight	40 (58.8)	17 (25)	11 (16.2)
Obese	14 (58.3)	6 (25)	4 (16.7)

Table 4.7 specified primary care-givers' knowledge of antioxidants with reference to the Diet Disease relationship. This required participants to have knowledge of antioxidants with 91 (61.9%) of participants selecting "yes" (refer to Table 4.7), 79 (53.7%) selecting Vitamin A as an antioxidant and 110 (74.8%) of participants selecting Vitamin C (refer to Table 4.8). The obese group however had a total of 45.8% of participants who selected "no" to Vitamin A being an antioxidant.

Table 4.8: Primary care-givers' knowledge of specific antioxidants

Primary care-givers' knowledge of specific antioxidants	Total sample n = 147 (%)	Normal weight n = 55 (37%)	Overweight n = 68 (46%)	Obese n = 24 (16%)
Vitamin A	79 (53.7%)	33 (60%)	38 (55.9%)	8 (33.3%)
Vitamin B	64 (43.5%)	24 (40 %)	32 (47.1%)	8 (33.3%)
Vitamin C	110 (74.8%)	41 (74.5%)	56(82.4%)	13 (54.2%)
Vitamin D	56 (38.1%)	17 (30.9%)	30 (44.1%)	9 (37.5%)
Vitamin E	74 (50.3%)	27(49.1%)	34(50%)	13 (54.2%)

4.5 Nutritional knowledge of the dietary recommendations

This section assesses the feeding practices of primary care-givers. This section provides Means (*M*) and Standard Deviations (*SD*) statistics specific to objective 1 of the study: to determine the behaviour (feeding practices) of primary care-givers with children under the age of 18.

Table 4.9 provides the Means (M) and Standard Deviations (SD) for the feeding practices of participants.

Table 4.9: Feeding Practices of participants

Subscales	Minimum	Maximum	Mean	SD
Child Control	5	22	12.73	3.46
Emotion regulation	3	12	5.05	1.99
Encourage balance and variety	5	20	15.39	3.27
Environment/parents	6	17	11.97	1.75
Food as reward	3	12	6.52	2.53
Parental Involvement	1	15	8.37	2.55
Parental Modelling	6	20	14.27	3.62
Parental Monitoring	4	20	14.50	4.36
Parental Pressure	4	19	10.38	3.34
Restriction for health	4	20	12.27	3.68
Restrictions for weight	7	32	15.65	4.89
Teaching about nutrition	3	15	8.82	2.66

Comprehensive child feeding practice maximum score = 160

The results in Table 4.9 suggest that in general parents were inclined to emphasise or encourage balance and variety in food intake of their children (*M* = 15.39, *SD* 3.27), monitor the food intake of their children (*M* = 14.50, *SD* 4.36), model healthy eating behaviour for their children (*M* = 14.27, *SD* 3.68), were involved (*M* = 8.37, *SD* 2.55), allowed their children control over feeding (*M* = 12.73, *SD* = 3.46), allowed their children variety at mealtimes (*M*= 15.39, *SD* = 3.27) and taught their children about nutrition (*M* = 8.82, *SD* = 2.66). Furthermore, participants did not use food to regulate their children's emotions (*M*= 5.05, *SD* = 1. 99). The results in Table 4.9 also show that participants tended to place restrictions on their children's food intake more for weight (*M*= 15.65, *SD*= 4.89) than for health (*M* = 12.27, *SD* 3.68) reasons and additionally tended to place pressure (*M* =10.38, *SD* 3.34) on their children to eat meals which are prepared.

4.6 A comparative analysis of the feeding practices for BMI groups

This section compares the feeding practices of primary care-givers. This section provides Means (*M*) and Standard Deviations (*SD*) statistics for part of objective 3 of the study: to compare the behaviour (indicated by feeding practices) of primary care-givers with low and high BMI scores.

Table 4.10 shows the Mean (*M*) and standard deviation (*SD*) scores for the Comprehensive Child Feeding Practice according to the BMI categories of primary care-givers.

Table 4.10: A Comparison of Feeding Practices of participants according to their BMI scores

	Normal Weight	Overweight	Obese
	n=55	n=68	n=24
Feeding Practices	***M* (*SD*)**	***M* (*SD*)**	***M* (*SD*)**
Child control	5.24 (2.31)	4.88 (1.84)	13.38 (3.34)
Emotional regulation	12.73 (3.00)	12.50 (3.84)	5.24(2.31)
Encourage balance and variety	15.76 (3.07)	15.18 (3.54)	15.17 (2.88)
Environment	12.09 (1.64)	11.81 (1.91)	12.13 (1.51)
Food as reward	6.49 (2.58)	6.38 (2.55)	7.00 (2.39)
Involvement	8.25 (2.66)	8.16 (2.37)	9.25 (2.65)
Modelling	14.67 (3.21)	13.65 (3.60)	15.08 (4.35)
Monitoring	14.36 (4.01)	14.41 (4.37)	15.08 (5.14)
Pressure	10.22 (3.14)	10.49 (3.48)	10.46 (3.45)
Restriction for health	11.95 (5.28)	12.35 (3.86)	12.75 (4.25)
Restriction for weight control	15.49 (5.28)	15.63 (4.97)	16.08 (3.72)
Teaching about nutrition	8.75 (2.30)	8.91 (2.74)	8.75 (3.23)

Table 4.10 suggests that participants were similar in their feeding practices across the BMI categories. These similarities were found for teaching about nutrition, pressuring to eat at meal times and encouraging balance and variety. The differences between the groups were tested for significance in each of the factors. The findings were not significant.

In summary

The results of this study were presented in the form of descriptive statistics of primary care-givers with different BMI scores. The results show that the majority of primary care-givers are knowledgeable about basic nutrition regarding fat intake, high sugar content foods, high or low protein-content foods as well as which foods should be consumed more than others in order to promote improved health. Primary care-givers were not all clear on some foods containing fat but no cholesterol. However, the majority of the participants knew which fat was harmful. Primary care-givers' behaviour regarding how and what their children should eat was seen more in the obese primary care-givers who were enforcing more control over their children's eating although this was not significantly different from the other groups. However, food is given as a reward to encourage behaviour change in their children. The feeding practice of primary care-givers showed that there was balance in food choice and variety that they wanted to bring across to their children. When comparing the three BMI categories we find that there are many similarities in nutritional knowledge, with all three groups being aware of antioxidants. However, more normal weight and overweight participants identified which vitamins were antioxidants. The results are further discussed in Chapter 5.

CHAPTER 5

DISCUSSION, RECOMMENDATIONS AND CONCLUSION

5.1 Introduction

This chapter allows for the integration of the theoretical framework presented in chapter 2, along with the results in chapter 4, leading to a discussion on the hypothesis. The limitations as well as recommendations are also presented in this chapter.

5.2. Discussion of the results as pertaining to the objectives of the study

(a) *To determine the nutritional knowledge and behaviour (indicated by eating and feeding practices) of primary care-givers with children under the age of 18.*

Nutritional knowledge is defined as habits involving regular eating patterns and vegetable intake (Emma, et al. 2008). In the study participants responded positively to the understanding of foods that needed to be decreased such as fats, sugars and salt. Participants were also aware of the foods which needed to be increased such as fibre, fruit and vegetables. The results were similar to previous research studies which indicate that basic messages regarding nutrition are being conveyed (Paramenter et, al., 2000; Gibson et, al., 1998). Due to the fact that research on knowledge has grown out of the interest in modifying people's dietary fat intake, nutritional knowledge scales were often designed to assess the knowledge about fat (McDonnell, McDonnell, Roberts, 1998; Levy, Fein & Stephenson, 1993; Stafleu et, al., 1996). Therefore the questionnaire used in this study was developed to assess the knowledge of adults with

associations between knowledge and intake of fruit, vegetables and fatty foods (Gibson et, al., 1999).

Advice-giving approaches aimed at stimulating dietary behaviour change are typically based on variations of the Knowledge–Attitudes–Behaviour model (Petty & Cacioppo, 1986). This model is based on the assumption that exposing an individual to new information leads to a gain in knowledge, prompting changes in attitude, which, in turn, will result in improved dietary behaviour (O'Brien & Davies, 2007). Despite a good level of awareness of the major guidelines on healthy eating and the existence of many public health campaigns aimed at encouraging healthier diets (e.g. Five-a-Day campaign in the United Kingdom, Health awareness weeks in South Africa), obesity rates continue to rise in the world (Paramenter, et al., 1999).

(b) *To determine the BMI (low and high) scores of primary care-givers with children under the age of 18.*

Body Mass Index (BMI) is defined as a comparison among various weight-for-height indices for both adults and children (Musher-E-Eisenman & Holub, 2007). In the current study we find that overweight primary care-givers, who were the majority of the sample, showed that they were knowledgeable in all areas. Knowledge about healthy food choices can be a predisposing factor for the adoption of a healthy diet but it is insufficient to motivate healthy eating along with psychosocial factors which also may need to be considered (Gracey, Stanley, Burke, Cort., Beilin, 1997). Associations between BMI (high) and adverse health outcomes, including cardiorespiratory disease, diabetes, and cancer, are well documented (Gracey et al., 1997). These diseases are likely to pose ever increasing public health problems as the prevalence of obesity

increases. The prevention of increasing BMI scores requires an understanding of its determinants throughout the life course (WHO, 2008).

(c) *To compare the nutritional knowledge and behaviour (indicated by eating and feeding practices) of primary care-givers with low and high BMI scores.*

This current study showed that primary care-givers, irrespective of their BMI, are knowledgeable regarding food choices, teaching their children about nutrition, allowing participation in the meal preparation on same level as well as encouraging their children to try new foods. However there was greater pressure to eat from the primary care-giver onto their children in the overweight group than the other groups. The results support hypothesis 1 and hypothesis 3. The results of the current study suggest that parents who are considered to be obese control their children's feeding as well as restrict their eating more than overweight and normal weight primary care-givers. This result supports hypothesis 1.

Obese primary care-givers were shown to restrict excess weight on their children by controlling feeding. This result supports hypothesis 1. The results presented highlight that overweight primary care-givers teach their children more about nutrition while they encourage balance and variety in meal choices. This supports hypothesis 2. Obese primary care-givers also modelled and monitored eating behaviour more in order to encourage their children to eat healthy. Overweight primary care-givers were also found to monitor their children's eating. These results support hypothesis 1. Swarr and Richards (1996) state that parental feeding practices can be related to children's eating behaviours and weight status. While Costabzo and Woodys (1985) state that the obesity proneness model suggests that primary care-givers have trouble controlling their own food intake and assume that their children cannot do so either.

The study results show that obese parents provide food for non-nutritive purposes as a means of reward, or as a means of changing the social behaviour of their child at the time, even though the primary care-giver modelled good eating behaviour at times. This has been linked to the reduction in the ability to internally regulate one's own feelings of hunger and satiety (Carper, et al., 2000). It has been found that these non-nutritive foods are more energy dense and have a low nutrient value. This coupled with the increased availability of 'junk' food and the decreased hunger signals when being encouraged to eat when not hungry, results in the increase in obesity in children (Musher-E-Eisenman, Lauzon-Guillain, Holub, Leporc & Charle, 2009).

A further explanation to restrictive feeding in primary care-givers could be that those who think their children are overweight or at risk of becoming overweight are more likely to practise restrictive feeding behaviours, whereas those who think their children are too thin are more likely to attempt to increase their intake (Spruijt-Metz, Lindquist, Birch, Fisher & Goran, 2002). Child feeding practices that set limits while allowing children to make eating decisions about what and how much to eat may foster self-control in eating (Birch et, al., 1987; Johnson & Birch, 1994). For instance, dietary restraint and dietary inhibition or eating in response to external cues has been noted in 9-12 year old children thus leading to overweight (Shapiro, Newcomb, & Leob, 1997; Fox, Page, Peters, Armstrong, & Kirby, 1994).

Both individual and public health initiatives targeting obesity have relied on this logic despite the fact that it is lacking in sound empirical foundations. This failure to convert increased knowledge into dietary behaviour change is well reported in the literature (Kristal, Bowen Curry, 1990; Fine, Conning & De Firmin, 1994). Therefore in the current study overweight and obese primary care-givers who model behaviour change to their children need to go a step further in trying to promote healthy eating for their families. O'Brian (2007), states that "nutrition education alone,

albeit necessary, is typically insufficient to facilitate behaviour change because of its failure to specifically address the personal, behavioural and environmental barriers to dietary behaviour change." This would suggest that in order to change both the BMI of primary care-givers and their behaviour one needs to facilitate the integration of nutritional education into behavioural programs targeting dietary behaviour change.

This can be done using the application of established psychological principles to health promotion behaviours which can effect behaviour change, e.g. social cognitive theory and the trans-theoretical model (Steptoe, Perkins-Porras, & McKay, 2003; Wilson, Friend, & Teasley, 2002) Lessons can be learnt from other health behaviour research, e.g. smoking, in which techniques such as motivational interviewing offers promise (O'Brian, 2007).

5.3 Relevance of Social Learning Theory

Bandura (1977) states:

> Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately, most human behavior is learned observationally through modeling: from observing others one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action.

When an individual observes others, an idea is formed of how new behaviours are performed, the individual internalizes this information and on later occasions this coded information serves as a guide for action (Bandura, 1977). The results of the study indicate that parents model behaviour in line with eating practice. Current research demonstrates similarities between parents' and children's food acceptance and preference, intake and willingness to try new foods (Patrick & Nicklas, 2005). However we find that mothers and children show similar patterns of food acceptance and food preference (Patrick & Nicklas, 2005). Children are more likely to sample unfamiliar foods after they have seen an adult eating the food, and are more likely to eat it when

they see their mother eating rather than a stranger (Harper & Saunders, 1975). Patrick and Nicklas (2005) state that research suggests that children will model dieting behaviour, for example, dieting daughters and dieting mothers. Parents who have difficulty in controlling their own intake were likely to have daughters who showed the same patterns (Cutting et, al., 1999). Therefore parents' behaviours with regard to dietary characteristics, food preferences, and intake regulation (e.g. dietary inhibition) are related to these same behaviours in their children. (Patrick & Nicklas, 2005). Issues raised at the time were those which Bandura (1977) also formalized such as *Self-observation* - example: Do you eat fried food every night or quick microwave meals and feed them to your children? Do you eat thick slices of bread with thin slices of cheese, or thin slices of cheese with thick slices of bread? One found that overweight and obese primary care-givers answered these questions but the answers were not in line with a healthy choice for their children. Secondly, *Judgment* **:** Some primary care-givers were worried about judgment to various responses to questions asked – this was brought about by them contacting the researcher to find out what their responses mean as parents. Finally, *self- response* **–** Primary care-givers asked if they were being good or bad parents in relation to what they were selecting as answers in the questionnaire, with some of them saying they do know what is good in the list but they do not provide that for their children, as they know their children will not consume it, as well as a means of avoiding arguments with their children. As the individual starts implementing what they have as evidence from their behavioural charts and diaries, they can begin to alter their environment. All of these examples have some influence on effective modelling.

5.4 Limitations of the study

The results of the study presented should be interpreted with caution as there are limitations to the study:

1. This study only focused on university staff. Thus the findings would not be able to be generalised to a larger sample of primary care-givers. Additionally, the majority of those who participated in the study had higher education levels, which means that a sample of primary care-givers with lower education levels may provide different results. The limitations were mainly directed by the challenges experienced during the data collection process. Many staff members were out of office or were no longer at the university during the data collection process.

2. Receiving e-mails from staff members indicating that they did not fit the profile of primary care-giver with children under 18 and that they did not want their e-mail box filling up with requests to complete the questionnaire.

3. A limitation of the sample was the willingness of staff members to complete the survey in totality and not have incompleted questionnaires being submitted, as staff either were no longer interested in continuing the questionnaire and submitting a ticked form. Some staff found the questionnaires to not to be relevant to them halfway through the process after ticking the tick box, which served as a means of consent.

4. The sample of the study was small (N=147) which was in the main due to primary care-givers having children older than 18 years of age. A larger sample could provide different results especially with regard to statistical comparisons between groups.

5. The racial categories in the study were; African 8.8%, Coloured 61.9%, White 25.2% and Asian 4.1% primary care-givers. The sample therefore indicates that most participants were from the coloured and white race groups, suggesting that culture was a possible confounding variable.

5.6 Recommendations

This study provides a basis for raising an awareness of primary care-givers' nutritional knowledge and feeding practices they use. We know that parents are key role-players in their children's lives therefore they are central in the prevention and treatment of weight related problems. Based on the results of this study, the recommendations are as follows

- Primary care-givers need to be made aware of the interplay of the genetic, environmental and familial influences in disease expression.

- Primary care-givers need to promote their children's self-regulating ability as well as not restrict the amount of food a child has at a mealtime but rather provide variety. Promoting healthier eating patterns for all means a multifaceted approach targeting children, parents, families and schools.

- Parents could be agents for quality food consumption as well as setting limits to non-nutritive foods, by modelling good behaviour and attitudes to food.

The results of this study provide a good basis to conduct further research in this field of study. Thus further research could:

- Bearing in mind that those who participated in the study were working primary care-givers, determine specific parenting practice and eating behaviour around working and non-working primary care-givers within the same household, and determine if they have different feeding practices;

- Further examine feeding practices of primary care-givers who are overweight with focus on parenting styles;

- Have a 50/50 split of gender participants;

- Include more variables such as monthly income, times per week that meals are home cooked, who in the household does the meal preparation, as well as where food is consumed (in front of the TV, dinner table and or in the room).

5.7 Conclusion

Primary care-givers are fundamental in shaping their children's lives. The life of the child includes the nutritional correctness of the meal provided to a growing child. Therefore family environments of shared and non-shared nature can influence children's weight status (Birch & Fisher, 2000) Primary care-givers also run the risk of not treating each child alike but rather parenting practices are shaped by each child's characteristics (Birch & Fisher,2000). The results of this study demonstrate that obese individuals and those of healthy weight had comparable levels of nutrition knowledge, suggesting that there may be reasons other than poor nutrition knowledge that account for the higher BMIs of the overweight and obese respondents. This notion is supported by researchers who note that there are few people remaining for whom lack of knowledge is the principal obstacle to eating a low fat diet (Wardle, 2000). Population based prevention will be a vital part of the effort to stem this rising tide of childhood obesity, described by some as having reached epidemic proportions. It is generally accepted that comprehensive and coordinated interventions which support and facilitate physical activity and healthy diets in the context of the social-determinants-of-health approach represent the best way forward for obesity prevention in childhood. It is essential that such interventions occur across the whole

population – in a variety of settings and through multiple strategies. Action must span policy, programmes and advocacy. Guiding principles for interventions to support behaviour change include policy support, equity, inclusivity, multi-sectoral engagement, transparency and environmental change. Surveillance, monitoring and evaluation are also critical to support effective action. Strategic investment is urgently required to implement effective and culturally appropriate population-based childhood obesity prevention programmes and initiatives, and to ensure that they include vulnerable groups, such as children with disabilities.

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APPENDICES

APPENDIX A

DEPARTMENT OF SOCIAL WORK

University of the Western Cape

Dear Dean and Head of Departments

I Melissa Brown, student number 2201040 have been given permission by the Higher Degrees Committee to conduct my research study for the purposes of completion towards the Degree of Magister Artium in Child and Family Studies. The Research title is Assessment of knowledge, behaviour and BMI of primary caregivers with children.

For this reason I need permission to access staff members within your faculty and departments in order to complete my data collection which will be done via an online questionnaire.

Included I have attached my Abstract for your consideration.

ABSTRACT

Research suggests that parents' feeding practices play a critical role in the development of children's tastes, eating habits, nutrition and eventual weight status (Musher-Eizenman & Holub, 2007). Thus if parental feeding practices play such a critical role, the question arises as to whether there is a difference in parental feeding practices of caregivers that determine different developments in children's nutritional habits**.** Furthermore, feeding practices are possibly based on the nutritional knowledge of parents. The aim of this study will, therefore, be to compare the nutritional knowledge and feeding practices primary care-givers. This study will follow the quantitative research paradigm. A sample of 300 staff members at The University of the Western Cape will be randomly selected to participate in this study. Only primary caregivers of children under the age of 18 will be invited to participate. The primary caregivers will be asked to complete the Comprehensive Child Feeding Questionnaire (CCFQ) and the General Nutritional Knowledge Questionnaire for adults. A pilot study will be conducted to check for the reliability of the instrument. Descriptive and inferential data analysis will be done by means of the Statistical Package for Social Sciences (SPSS). Recommendations will be offered after the analysis of the data.

Your consideration in the matter will be greatly appreciated. Please respond via email if in favour of accessing your professional and non-professional staff.

Yours Sincerely,

Melissa Brown

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APPENDIX B

Department of Social Work

University of the Western Cape

My name is Melissa Brown and I am currently a student at the University of the Western Cape enrolled in the Masters of Child and Family Studies. I am conducting research concerning nutritional knowledge. My study focuses on the nutritional knowledge, which you have and how this knowledge is relayed to your child/ren .You are therefore invited to voluntarily participate in the completion of a questionnaire for this study. Please be assured that the process will be confidential. Your questionnaire will be coded and therefore your anonymity will be protected. You may choose not to participate and should you no longer wish to participate in the study, you are free to withdraw. In the event that you need further assistance due to the questions evoking undue personal responses, and you are in anyway harmed, a list of support services will be provided to you. At the end of the study you will be given a summary of the study findings.

Should you wish to partake in the study, please sign and complete the following?

Signature: ……..

APPENDIX C - DEMOGRAPHIC QUESTIONNAIRE

Survey

Part A

Demographic Details

1. Age
2. Gender
3. Home language
4. What is your Race
5. Height in cm
6. Weight in kg
7. What is your highest level of eduction
8. How many children do you have
9. What is the gender of your child/(ren)

APPENDIX D –COMPREHENSIVE CHILD FEEDING QUESTIONNAIRE (CFPQ)

Part B

Please complete the following by choosing the relevant numbers 1-5

1: *never* **2**: *rarely* **3**: *sometimes* **4**: *mostly* **5**: *always*

Section 1

Do you let your child eat whatever s/he wants?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

At dinner, do you let this child choose the foods s/he wants from what is served?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

If this child does not like what is being served, do you make something else?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Do you allow this child to eat snacks whenever s/he wants?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Do you allow this child to leave the table when s/he is full, even if your family is not done eating?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 2

When this child gets fussy, is giving him/her something to eat or drink the first thing you do?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Do you give this child something to eat or drink if s/he is bored even if you think s/he is not hungry?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Do you give this child something to eat or drink if s/he is upset even if you think s/he is not hungry?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 3

Do you encourage this child to eat healthy foods before unhealthy ones?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I encourage my child to try new foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I tell my child that healthy food tastes good.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I encourage my child to eat a variety of foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 4

Most of the food I keep in the house is healthy.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I keep a lot of snack food (potato chips, eg. doritos, cheese puffs) in my house.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

A variety of healthy foods are available to my child at each meal served at home.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I keep a lot of sweets (candy, ice-cream, cake, pies, pastries) in my house.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 5

I offer sweets (candy, ice-cream, cake, pastries) to my child as a reward for good behavior.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I withhold sweets/dessert from my child in response to bad behavior.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I offer my child his/her favorite foods in exchange for good behavior.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 6

I involve my child in planning family meals.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I allow my child to help prepare family meals.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I encourage my child to participate in grocery shopping.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 7

I model healthy eating for my child by eating healthy foods myself.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I try to eat healthy foods in front of my child, even if they are not my favorite.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I try to show enthusiasm about eating healthy foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I show my child how much I enjoy eating healthy foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 8

How much do you keep track of the sweets (candy, ice-cream, cake, pies, pastries) that your child eats?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

How much do you keep track of the snack food (potato chips, Doritos, cheese puffs) that your child eats?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

How much do you keep track of the high-fat foods that your child eats?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

How much do you keep track of the sugary drinks (soda/pop, kool-aid) this child drinks?

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 9

My child should always eat all of the food on his/her plate.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

If my child says, "I'm not hungry," I try to get him/her to eat anyway.

never ***rarely*** ***sometimes*** ***mostly*** ***always***

If my child eats only a small helping, I try to get him/her to eat more.

never ***rarely*** ***sometimes*** ***mostly*** ***always***

When s/he says s/he is finished eating, I try to get my child to eat one more (two more, etc.) bites of food.

never ***rarely*** ***sometimes*** ***mostly*** ***always***

Section 10

If I did not guide or regulate my child's eating, s/he would eat too much of his/her favorite foods.

never ***rarely*** ***sometimes*** ***mostly*** ***always***

If I did not guide or regulate my child's eating, s/he would eat too many junk foods.

never ***rarely*** ***sometimes*** ***mostly*** ***always***

I have to be sure that my child does not eat too much of his/her favorite foods.

never ***rarely*** ***sometimes*** ***mostly*** ***always***

I have to be sure that my child does not eat too many sweets (candy, ice-cream, cake, or pastries).

never ***rarely*** ***sometimes*** ***mostly*** ***always***

Section 11

I have to be sure that my child does not eat too many high-fat foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I encourage my child to eat less so s/he won't get fat.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I give my child small helpings at meals to control his/her weight.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

If my child eats more than usual at one meal, I try to restrict his/her eating at the next meal.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I restrict the food my child eats that might make him/her fat.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

There are certain foods my child shouldn't eat because they will make him/her fat.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I don't allow my child to eat between meals because I don't want him/her to get fat.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I often put my child on a diet to control his/her weight.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

Section 12

I discuss with my child why it's important to eat healthy foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I discuss with my child the nutritional value of foods.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

I tell my child what to eat and what not to eat without explanation.

never ○ ***rarely*** ○ ***sometimes*** ○ ***mostly*** ○ ***always*** ○

APPENDIX E- GENERAL NUTRITIONAL KNOWLEDGE QUESTIONNAIRE FOR ADULTS

Part C

Questions

1. Do you think health experts recommend that people should be eating more, the same amount, or less of these foods?
   - Vegetables ***more*** ***same*** ***less*** ***not sure***
   - Sugary foods (sweets chocolates) ***more*** ***same*** ***less*** ***not sure***
   - Meat ***more*** ***same*** ***less*** ***not sure***
   - Starchy foods (potatoes, rice) ***more*** ***same*** ***less*** ***not sure***
   - Fatty foods (hamburgers, fried chips) ***more*** ***same*** ***less*** ***not sure***
   - High fibre foods ***more*** ***same*** ***less*** ***not sure***
   - Fruit ***more*** ***same*** ***less*** ***not sure***
   - Salty foods (processed meats) ***more*** ***same*** ***less*** ***not sure***
2. How many servings of fruit and vegeatables a day do you think experts are advising people to eat? (One serving could be, for example, an apple or a handful of chopped carrots)

   1 ***2*** ***3*** ***4*** ***5*** ***or more***
3. Which fat do experts say is most important for people to cut down on?

   mono-unsaturated fat ***poly-unsaturated fat*** ***saturated fat*** ***not sure***

4. What version of dairy foods do experts say people should eat?

   full fat ○ ***low fat*** ○ ***mixture of full fat and low fat*** ○ ***neither, dairy foods should be cut out*** ○ ***not sure*** ○

5. Do you think these are high or low in added sugar?

   - Bananas

     high ○ ***low*** ○ ***not sure*** ○

   - Unflavoured yoghurt

     high ○ ***low*** ○ ***not sure*** ○

   - Ice-cream

     high ○ ***low*** ○ ***not sure*** ○

   - Orange squash

     high ○ ***low*** ○ ***not sure*** ○

   - Tomato ketchup

     high ○ ***low*** ○ ***not sure*** ○

   - Tinned fruit in natural juice

     high ○ ***low*** ○ ***not sure*** ○

6. Do you think these are high or low in fat?

   - Pasta (without sauce)

     high ○ ***low*** ○ ***not sure*** ○

   - Low fat spread

     high ○ ***low*** ○ ***not sure*** ○

   - Baked beans

     high ○ ***low*** ○ ***not sure*** ○

   - Luncheon meat (processed meat, salami)

     high ○ ***low*** ○ ***not sure*** ○

   - Honey

     high ○ ***low*** ○ ***not sure*** ○

   - Scrambled egg

     high ○ ***low*** ○ ***not sure*** ○

- Nuts

  high ○ ***low*** ○ ***not sure*** ○

- Bread

  high ○ ***low*** ○ ***not sure*** ○

- Cottage cheese

  high ○ ***low*** ○ ***not sure*** ○

- Polyunsaturated margarine

  high ○ ***low*** ○ ***not sure*** ○

7. Do you think experts put these in the starchy foods group?

   - Cheese

     yes ○ ***no*** ○ ***not sure*** ○

   - Pasta

     yes ○ ***no*** ○ ***not sure*** ○

   - Butter

     yes ○ ***no*** ○ ***not sure*** ○

   - Nuts

     yes ○ ***no*** ○ ***not sure*** ○

   - Rice

     yes ○ ***no*** ○ ***not sure*** ○

   - Porridge

     yes ○ ***no*** ○ ***not sure*** ○

8. Do you think these are high or low in salt?

   - Sausages

     high ○ ***low*** ○ ***not sure*** ○

   - Cheese

     high ○ ***low*** ○ ***not sure*** ○

   - Frozen vegetables

     high ○ ***low*** ○ ***not sure*** ○

- Red meat

  high ○ ***low*** ○ ***not sure*** ○

- Capers

  high ○ ***low*** ○ ***not sure*** ○

- Pasta

  high ○ ***low*** ○ ***not sure*** ○

9. Do you think these are high or low in protein?

   - Chicken

     high ○ ***low*** ○ ***not sure*** ○

   - Cheese

     high ○ ***low*** ○ ***not sure*** ○

   - Fruit

     high ○ ***low*** ○ ***not sure*** ○

   - Baked beans

     high ○ ***low*** ○ ***not sure*** ○

   - Butter

     high ○ ***low*** ○ ***not sure*** ○

   - Cream

     high ○ ***low*** ○ ***not sure*** ○

10. Do you think these are high or low in fibre?

    - Cornflakes

      high ○ ***low*** ○ ***not sure*** ○

    - Bananas

      high ○ ***low*** ○ ***not sure*** ○

    - Eggs

      high ○ ***low*** ○ ***not sure*** ○

    - Red Meat

      high ○ ***low*** ○ ***not sure*** ○

- Broccoli

  high ○ ***low*** ○ ***not sure*** ○

- Nuts

  high ○ ***low*** ○ ***not sure*** ○

- Fish

  high ○ ***low*** ○ ***not sure*** ○

- Baked potatoes with skins

  high ○ ***low*** ○ ***not sure*** ○

- Chicken

  high ○ ***low*** ○ ***not sure*** ○

- Baked beans

  high ○ ***low*** ○ ***not sure*** ○

11. Do you think these fatty foods are high or low in saturated fat?

- Mackerel

  high ○ ***low*** ○ ***not sure*** ○

- Whole milk

  high ○ ***low*** ○ ***not sure*** ○

- Olive oil

  high ○ ***low*** ○ ***not sure*** ○

- Red meat

  high ○ ***low*** ○ ***not sure*** ○

- Sunflower margarine

  high ○ ***low*** ○ ***not sure*** ○

- Chocolate

  high ○ ***low*** ○ ***not sure*** ○

12. Some foods contain a lot of fat but no cholesterol?

    agree ○ ***disagree*** ○ ***not sure*** ○

13. Do you think experts call these a healthy alternative to red meat?

- Liver pate

  yes ○ ***no*** ○ ***not sure*** ○

- Luncheon meat

  yes ○ ***no*** ○ ***not sure*** ○

- Baked beans

  yes ○ ***no*** ○ ***not sure*** ○

- Nuts

  yes ○ ***no*** ○ ***not sure*** ○

- Low fat cheese

  yes ○ ***no*** ○ ***not sure*** ○

- Quiche

  yes ○ ***no*** ○ ***not sure*** ○

14. A glass of unsweetened fruit juice counts as a helping of fruit.

    agree ○ ***disagree*** ○ ***not sure*** ○

15. Brown sugar is a healthy alternative to white sugar.

    agree ○ ***disagree*** ○ ***not sure*** ○

16. There is more protein in a glass of full cream milk than in a glass of skimmed milk.

    agree ○ ***disagree*** ○ ***not sure*** ○

17. Polyunsaturated margarine contains less fat than butter.

    agree ○ ***disagree*** ○ ***not sure*** ○

18. Which of these breads contain the most vitamins and minerals?

    white ○ ***brown*** ○ ***wholegrain*** ○ ***not sure*** ○

19. Which do you think is higher in calories: butter or regular margarine?

    butter ○ ***regular margarine*** ○ ***both the same*** ○ ***not sure*** ○

20. There is more calcium in a glass of whole milk than a glass of skimmed milk.

    agree ○ ***disagree*** ○ ***not sure*** ○

21. Which one of the following has the most calories for the same weight?

    sugar ○ ***starchy foods*** ○ ***fibre*** ○ ***fat*** ○ ***not sure*** ○

22. Which would be the best choice for a low fat, high fibre light meal?

grilled chicken ○ ***cheese on wholewheat toast*** ○ ***beans on wholewheat toast*** ○ ***quiche*** ○

23. If a person wanted to reduce the amount of salt in their diet, which would be the best choice?

ready made frozen shepherds pie ○ ***gammon with pineapple*** ○ ***mushroom omelette*** ○ ***stir fry vegetables with soy sauce*** ○

24. Which of these would be the healthiest pudding?

baked apple ○ ***strawberry yoghurt*** ○ ***wholewheat crackers and cheddar cheese*** ○ ***carrot cake with cream cheese topping*** ○

25. Which kind of sandwich do you think is healthier?

two thick slices of bread with a thin slice of cheddar cheese filling ○ ***two thin slices of bread with a thick slice of cheddar cheese filling*** ○

26. Many people eat spaghetti bolognese (pasta with a tomato and meat sauce). Which do you think is healthier?

a large amount of past with a little sauce on top ○ ***a small amount of pasta with a lot of sauce on top*** ○

27. If a person wanted to reduce the amount of fat in their diet, which would be the best choice?

steak, grilled ○ ***sausages, grilled*** ○ ***turkey, grilled*** ○ ***pork chop, grilled*** ○

28. Which one of these is more likely to raise people's blood cholesterol level?

antioxidants ○ ***polyunsaturated fats*** ○ ***saturated fats*** ○ ***cholesterol in the diet*** ○ ***not sure*** ○

29. Have you heard of antioxidant vitamins?

yes ○ ***no*** ○ ***not sure*** ○

30. If YES to question 29, do you think these are anti-oxidant vitamins?

    - Vitamin A

      yes ○ ***no*** ○ ***not sure*** ○

    - B Complex Vitamins

      yes ○ ***no*** ○ ***not sure*** ○

    - Vitamin C

      yes ○ ***no*** ○ ***not sure*** ○

- Vitamin D

  yes ○ ***no*** ○ ***not sure*** ○

- Vitamin E

  yes ○ ***no*** ○ ***not sure*** ○

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