UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

AN INVESTIGATION INTO THE CAPACITY OF CAREGIVERS TO PROVIDE NUTRITION-RELATED CARE TO PRE-SCHOOL-AGE CHILDREN

By

MAKWENA CATE MOLOTJA

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

MASTER OF CONSUMER SCIENCE: DEVELOPMENT

IN THE FACULTY OF NATURAL & AGRICULTURAL SCIENCE

DEPARTMENT OF CONSUMER SCIENCE

UNIVERSITY OF PRETORIA

PRETORIA

APRIL 2008

SUPERVISOR: DR ROZANNE KRUGER

DECLARATION

I **Makwena Cate Molotja** hereby declare that the thesis/dissertation for the **Master of Consumer Science: Development** degree at the University of Pretoria, hereby submitted by me, has not previously been submitted for a degree at this or any other university and that it is my own work in design and execution and that all reference material contained herein has been duly acknowledged.

Signature: Makwena Cate Molotja

Date: 29 April 2008

ACKNOWLEDGEMENTS

My sincerest gratitude and appreciation to the following people:

- Dr Rozanne Kruger, the supervisor of this study, who was a continuous source of knowledge, encouragement, inspiration and support.
- The staff members of the King's Hope Development Foundation for their support and help that enabled me to gain entry into the research area and to meet with some respondents.
- The principal and staff members of the 'Dimphonyana Tsa Lapeng' Crèche for allowing me to use the crèche facilities, staff members and children as part of the study.
- The parents of the children who put aside time to participate in this study. I treasure their friendliness and trust.
- Ms Mosima Masekoameng, who has always been a source of support, inspiration and guidance throughout this study.
- Mrs Rina Owen for the statistical analysis of the results of this study and for her patience and willingness to clarify any statistical-related questions I had with regard to this study.
- My sisters and brothers for their support and help by looking after my daughter while I stayed away to complete this study.
- My daughter, Owami for tolerating my absence over weekends and my late stay at work during the week to complete this study.
- My parents, for always believing in me and encouraging me to persevere in all my studies.
- Mr Henry Pinkham for language editing.

I also want to thank the Almighty God, who has always given me perseverance, insight, patience and the ability to complete this study.

TABLE OF CONTENTS

CHAPTER 4: PRESENTATION AND DISCUSSION OF RESULTS

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

LIST OF TABLES

CHAPTER 1:

CHAPTER 4:

CHAPTER 5:

LIST OF FIGURES

CHAPTER 2:

CHAPTER 3:

CHAPTER 4:

LIST OF ADDENDA

LIST OF ABBREVIATIONS

FAO:	FOOD AND AGRICULTURAL ORGANIZATION
UNICEF:	UNITED NATIONS CHILDREN'S FUND
NFCS:	NATIONAL FOOD CONSUMPTION SURVEY
INP:	INTEGRATED NUTRITION PROGRAMME
ICN:	INTERNATIONAL CONFERENCE ON NUTRITION
WHO:	WORLD HEALTH ORGANIZATION
UP:	UNIVERSITY OF PRETORIA

SUMMARY

Malnutrition is the outcome of many complex and interrelated factors such as lack of food security, lack of health services, sanitation, knowledge, education and care. It is considered to be a major problem worldwide as well as in South Africa, and the pre-school child is especially vulnerable to developing nutritional deficiencies and diseases. The aim of the study was to investigate the capacity of caregivers to provide nutrition-related care to pre-school-age children (3 to 5 years) in a resource-poor peri-urban community (Olievenhoutbosch) situated in the Gauteng province of South Africa. The study followed a cross-sectional research design, using a quantitative research approach with qualitative aspects to attempt to answer the research question. The questionnaire used for data collection covered aspects such as the resources for care that caregivers had, their nutrition knowledge and caring activities used as part of caring capacity. The questionnaire was administered to a sample of caregivers (50 mothers and two crèche caregivers) of pre-school-age children as key informants for this study.

The study revealed that the caregivers' caring capacities in this community highly depended on the availability and use of certain resources such as human resources (education, time and social support in terms of the availability of alternative caregivers), economic resources (having a job or any source of income) and organizational resources (e.g. child care facilities such as crèches). The mothers had limited resources such as human, economic and organizational resources that would help in childcare practices. Time was a serious constraint that could compromise the level of care provided by the two crèche caregivers.

The caregivers had basic nutrition knowledge, but did not have detailed nutrition knowledge. They could mention healthy food types for the child's optimal growth and development, but could not defend their choices by giving nutritionally sound reasons. Some misconceptions regarding the consumption of certain foods were

prevalent. Caring activities in this study involved more than just the provision of food (i.e. food choices, food preparation and feeding practices), but involved other important aspects such as allowing the child time to sleep and play (and sometimes play with the child), ensuring the child's hygiene (i.e. bathing the child, dressing the child, washing the child's clothes, cleaning the place where the child stays, plays, eats and sleeps) and performing educational activities with the child.

There is a serious need for proper nutrition education which will impart knowledge of appropriate food choices; components of a nutritious diet (healthy types of foods, drinks and snacks); functions of foods in the child's body; hygienic food handling, preparation, and storage methods that would be translated into good care practices and contribute to the child's optimal growth and development.

CHAPTER 1: BACKGROUND AND RATIONALE

1.1 INTRODUCTION

Sound nutrition is a basic human right, guaranteed in the South African Constitution through the Bill of Rights (Department of Health, 2002a:1). Proper nutrition during childhood is essential for normal growth and development. Nutrition security incorporates the security of food, health and care, where security refers to sustainability (having food and good nutrition on an ongoing basis). According to the Food and Agricultural Organization (FAO) (1997:5 of 28) nutrition security is influenced by a wide range of factors that may lead to inadequate or excessive nutrient utilization. The factors most directly influencing nutritional status are analysed under the categories of food security, health, and knowledge and care (FAO, 1997:5 of 28). Each of the factors is essential to attain good nutritional status, and they often interact with one another. Therefore, sound nutrition involves more than just the availability of food or the consumption of a certain amount of kilojoules, proteins, vitamins, etc. per day (Department of Health, 2002a: 1).

Malnutrition has been a serious problem affecting many of children in the developing countries and the United Nations Children's Fund (UNICEF) (2007:2) state that undernutrition has been estimated to be an underlying cause for around half of all child deaths worldwide. Twelve years ago Dannhauser, Joubert and Nel (1996:14) reported that approximately more than 500 million people are chronically malnourished and more than 13 million children under the age of five years die annually due to infections as a direct or indirect result of hunger and malnutrition. World-wide, approximately 200 million children under five years of age are stunted or of low height-for-age (Chevassus-Agnes, 1999:1), and more than 160 million are severely underweight (FAO, 2001:v). UNICEF (2007:2) reported that, for the first time, the number of children dying before their fifth birthday fell below 10 million, to 9.7 million, which is an important milestone in child survival. Although there has been a decline in the global number of child

deaths caused by malnutrition, UNICEF (2007:4) state that 143 million children (under five) in the developing world continue to suffer from undernutrition, with more than of them in South Asia (42%). According to the FAO (1997:) malnutrition affects one out of every three pre-school-age children living in developing countries. It is evident that malnutrition takes a heavy toll on nations, affecting growth, health, productivity and quality of life of their peoples. Malnutrition affects specific groups of people rather than the whole nation (FAO, 2001:iii). In infants and young children, malnutrition is associated with reduced physical activity, impaired resistance to infection, impairment of mental development and reduced educational capacity, and increased morbidity and mortality (FAO, 1997:1 of 3). Given the worldwide situation of malnutrition, it is clear that pre-school children are the worst affected. Improvement of the nutritional conditions of those affected by malnutrition is an investment which can help raise the productive capacity of both present and future generations. Therefore, efforts and resources to improve nutrition must be directed to those most in need.

1.2 THE NUTRITION SITUATION IN SOUTH AFRICA

Although good nutrition is universally accepted as a basic human right, the health and nutritional status of millions of South Africans are far from optimal (Vorster, Oosthuizen, Jerling, Veldman & Burger, 1997:1). Undernutrition is considered to be a major problem worldwide as well as in South Africa, and the pre-school child is especially vulnerable to developing nutritional deficiencies and diseases (Krige & Senekal, 1997:14). In South Africa, undernutrition is mainly prevalent amongst Black, Coloured and Asian children and especially in the lower socio-economic communities (Krige & Senekal, 1997:14). The South African National Food Consumption Survey (NFCS) of 1999 (Department of Health, 2000:3) revealed that stunting is a major problem that affects children (21,6%) between the ages of one and nine, and children living on commercial farms and in tribal and rural areas are the most severely affected.

In 1995, the Minister of Health in South Africa appointed the Nutrition Committee, which made the recommendation to develop the Integrated Nutrition Programme (INP) to help develop a nutrition strategy for South Africa (Department of Health, 2000:3). The vision of the INP is optimum nutrition for all South Africans (Department of Health, 2000:19) and its mission is to improve the nutritional status of all South Africans through implementing integrated nutrition activities (Department of Health, 2000:20). One of the strategic goals of the INP for the period 2002 to 2007 is to contribute to the prevention and reduction of morbidity and mortality rates due to malnutrition, nutrition-related diseases of lifestyle, communicable and infectious diseases and debilitating conditions (Department of Health, 2000:36). One of the strategic objectives of the INP for the period 2002 to 2007 is to contribute to the reduction of malnutrition in children under five (5) years of age, specifically of underweight, severe underweight, stunting and wasting (see table 1.1).

TABLE 1.1: CURRENT STATUS OF MALNUTRITION IN CHILDREN <5 YEARS OF AGE AND THE TARGET TO BE REACHED BY THE YEAR 2007 (DEPARTMENT OF HEALTH, 2002b:37-38)

Type of Malnutrition[a]	Baseline[b]	Current Status[c]	Target[d]
Underweight	Primary school learners (1994: 9%) Children 6 months to 6 years (1995: 9.3%)	Children 1 to 9 years (1999: 10.3%)	8%
Severe Underweight	Primary school learners (1994: 0.5%) Children 6 months to 6 years (1995: 1.4%)	Children 1 to 9 years (1999: 1.4%)	1%
Stunting	Primary school learners (1994: 13.2%) Children 6 months to 6 years (1995: 22.9%)	Children 1 to 9 years (1999: 21.6%)	18%
Wasting	Primary school learners (1994: 2.6%) Children 6 months to 6 years (1995: 2.6%)	Children 1 to 9 years (1999: 3.7%)	2%

[a] type of malnutrition
[b] percentages of children from different age groups affected by the type of malnutrition given in the first column and the year in which the information was obtained.
[c] information obtained from the 1999 National Food Consumption Survey, which targeted children between the ages of one and nine years; percentages of children affected by the type of malnutrition.
[d] the target to be reached (percentages) by the year 2007 on the reduction of each type of malnutrition, for example, by the year 2007, underweight in children must have been reduced by eight percent (8%).

Malnutrition is not only a food-related problem, but it is the outcome of many complex and interrelated factors such as lack of health services, sanitation, knowledge, education and care (FAO, 1997:1 of 3). To ensure optimal nutrition for all South Africans, simultaneous action in all three areas, namely food

security, health, and knowledge and care, is required. Malnutrition requires complementing strategies and an integrated approach to ensure nutrition for all South Africans (Department of Health, 2002a:4).

1.3 RATIONALE OF THE STUDY

The rationale of this study is embedded in the declaration of 'The International Conference on Nutrition (ICN)', convened by the Food and Agricultural Organization (FAO) and the World Health Organization (WHO) in Rome in 1992. The aim of the conference was to raise global awareness of the causes of malnutrition, and to encourage action to promote and protect the nutritional well-being of vulnerable populations through specific short-term nutrition programmes together with continuous work towards long-term solutions (FAO, 1997:3 of 3). In South Africa, sound nutrition is a basic human right, guaranteed in the South African Constitution through the Bill of Rights and the Department of Health has as one of its obligations, to ensure that nutrition security is respected, protected, facilitated and provided to the people of South Africa (Department of Health, 2002a:1).

Care, as one of the factors influencing the nutritional status of children, has never received much attention as food security, but according to UNICEF as quoted in Ruel, Levin, Armar-Klemesu, Maxwell and Morris (1999:1) care is increasingly recognized as an important determinant of good health and nutrition among preschoolers, along with food security, availability of health services and a healthy environment. According to Ruel *et al* (1999:18) care practices are strong determinants of children's nutritional status, and particularly so for children from poorer households and children of mothers with less than a secondary school education. Therefore, good care practices could compensate for the negative effects of poverty and low maternal schooling on children's nutritional status. Based on this background information, the research problem of this study is: "What are the caring capacities of caregivers of pre-school-age children?" The

aim of this study is to investigate the caring capacity of caregivers of pre-school-age children (aged three to five years) by looking at the resources for care that are available to the caregivers, the nutritional knowledge of the caregivers, and the caring activities performed by the caregivers as part of caring capacity. It is essential, therefore, to conduct this study, which could be used to promote good care-giving practices, and, in a way, to contribute to good health and nutrition among preschoolers.

As a possible outcome of the study the findings could be used to look at the possible formulation of guidelines and suggestions for future strategy development in the "care and food security approach". Although care is a multidimensional concept, the focus of this study is only on nutrition-related aspects of care. Cognitive or psychological aspects of care will not be addressed in this study due to limitations in time, budget and the nature of this study (which is a script). This study targets caregivers (i.e. all persons who provide appropriate care to the child, e.g. a mother, sibling, grandparent, father, a person at a childcare centre) of pre-school-age children because they are the ones who perform caring activities and consequently determine the quality of care the children receive.

1.4 CHALLENGES

Given the current situation in South Africa, the country is faced with a serious challenge to address the problem of malnutrition in all areas simultaneously, so as to improve the nutritional status of vulnerable and affected groups, and to ensure optimal nutrition for all South Africans. Although malnutrition is not only a food-related problem, most literature has in the past focussed more on food security to address malnutrition. According to Engle, Bentley and Pelto (2000:25) the importance of cultural and behavioural factors (including care-giving behaviour for good nutrition) in children's nutrition, particularly with regard to

feeding, has been recognized only recently. In 1990, UNICEF proposed a conceptual framework that suggested that not only were food security and healthcare services essential for child survival, but care for women and children was equally important (Engle *et al*, 2000:26). Bouis and Hunt (1999:169) also state that the standard food-care-health conceptual model of FAO/WHO (1992) makes it clear that the provision of adequate care to women and children, together with adequate water, sanitation, and healthcare systems, is needed to ensure good growth and development.

According to the Department of Health (2002a:4) one of the broader strategies to improve the nutritional status of all South Africans is to improve nutrition knowledge, behaviour, perceptions and attitudes of the population through nutrition education. It is through nutrition education that people (particularly caregivers of preschool-age children) will become aware that their care practices are strong determinants of children's nutritional status.

A challenge to researchers will be to create awareness, among the South African population, of care and nutrition knowledge as equally important factors contributing to the growth and development of children. Nutrition education activities should incorporate food security, health, care and knowledge with the aim to address nutrition-related problems in South Africa. The full participation of the vulnerable and affected groups should be encouraged in all intended activities. The participants should be the beneficiaries of such research so that they can be able to improve the quality of their lives.

1.5 BACKGROUND OF THE STUDY

This study contributed to the background information of a larger project ("developing a food based model to improve household food security on commercial farms in South Africa") which was initiated on Oranje farm situated in Fouriesburg district (Free State province). The project involved various

postgraduate students from the Department of Consumer Science of the University of Pretoria (UP). The research problem of the larger focus project (Green, 2003:9) was to determine how household food security on commercial farms can be improved through the implementation and evaluation of community-based nutrition programs and other supplementary interventions. A model has been developed for this purpose.

As mentioned before, the nutritional status is influenced by a wide range of factors, but this study will focus on only two of these, namely care practices and nutrition knowledge. Household food security aspects have already been dealt with by other students in the larger project. This study looks at two important aspects which are some of the underlying causes of malnutrition. The aim of this study is to investigate care practices and nutrition knowledge of caregivers as part of caring capacity to help address malnutrition as a nutrition-related problem in a resource poor peri-urban community and thereby to contribute positively to the growth and development of pre-school children. Since malnutrition is the outcome of many complex and interrelated factors imparting on the lives of people, it will be better to address all the factors simultaneously. The results of this study will build and strengthen the initial model which addressed some of the underlying causes of malnutrition such as household food security, hygiene and sanitation.

1.6 OUTLINE OF THE SCRIPT

This section provides an outline of the rest of the script. Chapter 1 provides the background, rationale and aim of the study. Chapter 2 departs with the UNICEF Nutrition Conceptual Framework, which was used as a theoretical framework for this study. This chapter also highlights the most pertinent findings as discussed by other researchers in terms of factors affecting the nutritional status of pre-school-age children. Key concepts, around which the study is built, such as care,

caring capacity, resources, nutrition knowledge and care-giving activities or practices, are defined in chapter 2.

Chapter 3 provides the research problem as well as sub-problems. It also gives the conceptual framework designed specifically for this study, highlighting the importance of care of children to the overall growth and development of the child. The measuring instrument (questionnaire given as an appendix), research design, study population and sample, procedure and data collection methods are also addressed. The chapter concludes by outlining ways and methods used to enhance the quality of the research process as well as the research results. The limitations of this study are also discussed in chapter 3.

Chapter 4 provides the findings of the study obtained by using the SAS computer program. The results are of a descriptive nature, and are summarised in tables and graphs. The results are interpreted and discussed to give meaning to the tables and graphs, showing the relationship between the results and literature. Chapter 5 provides a brief summary and conclusions regarding the main findings of the study. The limitations and gaps of the study are identified and recommendations regarding further research are also made.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

Nutrition security is influenced by a wide range of factors that may lead to inadequate or excessive nutrient intake or may impair nutrient utilization (FAO, 1997:5). In South Africa, nutrition problems are addressed by using the UNICEF Nutrition Conceptual Framework (Department of Health, 2002a:1), which was also used as a theoretical framework for this study. This study focused on some of the factors from the conceptual framework that influence the nutritional status of pre-school-age children. These factors are dealt with in more detail later in this chapter.

2.2 THEORETICAL FRAMEWORK

The UNICEF Nutrition Conceptual Framework (Figure 2.1), which explains malnutrition as the outcome of an interrelated complex of basic, underlying and immediate causes was used as a theoretical framework for this study.

The nutritional status and subsequently survival, growth and development of children is influenced by a wide range of factors, but this study focussed on the highlighted central part of the framework, where it is indicated that inadequate maternal and child care may contribute, through various routes, to inadequate dietary intake, and subsequently, malnutrition and death. Nutrition-related aspects of care such as the caregiver's nutrition knowledge to properly care for the pre-school-age child were also addressed in this study. The opposite is however also important, as the ultimate focus would rather be placed on adequate and sufficient maternal and child care, followed by adequate dietary intake and then growth and development of children.

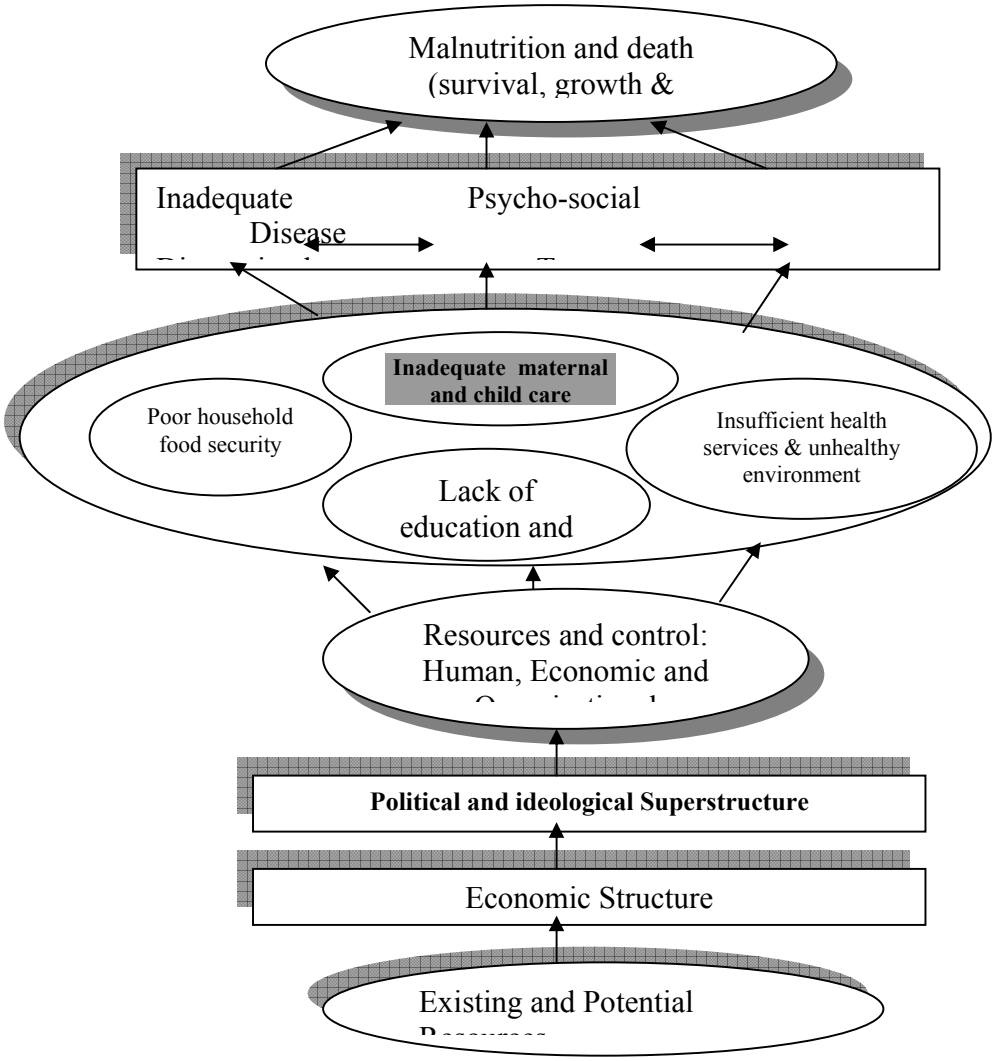


FIGURE 2.1: THE UNICEF CONCEPTUAL FRAMEWORK ON NUTRITION (adapted from: Department of Health, 2000:5)

2.3 FACTORS INFLUENCING THE NUTRITIONAL STATUS OF PRE-SCHOOL-AGE CHILDREN (THREE TO FIVE YEARS)

Good nutritional status is the outcome of many complex and interrelated factors imparting on the lives of people. The factors most directly influencing nutritional status are analysed under the categories of food security, health, knowledge, and care as indicated in figure 2.1 (FAO, 1997:5 of 28). Poverty, which results in poor food availability, overcrowded and unsanitary living conditions, and improper

child care, is a frequent cause of malnutrition (FAO, 1997:3 of 39). Acute and chronic undernutrition and most micronutrient deficiencies primarily affect the poor and deprived people who do not have access to adequate food, live in unsanitary environments without access to sufficient and clean water and basic services and lack access to appropriate education and information (FAO, 1997:5 of 28). According to Dannhauser *et al* (1996:14), food insecurity, which leads to inadequate dietary intake, is the major factor contributing to the poor nutritional status of people in general.

Krige and Senekal (1997:17-22) have identified a number of factors (some significant and some suggestive trends), which may possibly contribute to the development of undernutrition in their study of the pre-school children of farm workers in the Stellenbosch district. These factors are inadequate dietary intake; inadequate food supply at home; higher incidence of undernutrition associated diseases; a high percentage of unmarried mothers living with a man; low educational status and nutritional knowledge of mothers; low income levels; poor financial planning (budgeting); low food production at home (vegetable gardens); lack of appliances for the cooling and freezing of food; lack of acceptable toilet facilities; and lack of running water in houses (Krige & Senekal, 1997:22). Although nutritional status is influenced by a wide range of factors, this study only focused on the caring capacity as related to nutritional aspects of caregivers of pre-school-age children. For this study pre-school-age children refer to all children who are still at too young an age to start formal schooling. In South Africa, formal schooling officially starts in the year the child turns seven, therefore the cut off for this study will be 5 years or not at school. Pre-school-age children have high nutrient needs, because they are more physically active, but their playing can sometimes interfere with eating adequate food (Thompson & Manore, 2005:583). Therefore, it is important that caregivers, who make all the food choices for the preschool-age-child during this vital period of growth and development, ensure that they consume the required amounts of nutrients from foods so that they can grow and develop properly. Caregiver refers to any person

(whether it be a mother, sibling, grandparent, father, other relatives, a person at a childcare centre or even a man) who provide the appropriate care to the child (Engle *et al*, 2000:27).

The study conducted by Ruel *et al* (1999:18) in Accra, showed that care practices are strong determinants of children's nutritional status, and particularly so for children from poorer households and children of mothers with less than a secondary school education. Therefore, good care practices could compensate for the negative effects of poverty (that is low maternal education and insufficient income) and therefore improve the nutritional status of children. This study focused on the positive aspects of the UNICEF's conceptual framework (i.e. survival, growth and development); therefore aspects that may have an impact need to be addressed.

2.4 THE CONCEPT OF CARE

Care refers to practices performed by caregivers that affect the child's nutrient intake, health and development (Engle, Menon & Haddad, 1997:3). According to Macharia, Kogi-Makau and Muroki (2004:402) from a nutritional point of view, childcare encompasses all measures and behaviours that translate available food and health resources into good child growth and development. It is important to keep in mind that care is multidimensional, and should not be restricted to feeding. For this study, care refers to the act of providing what a person (the caregiver) needs to keep the child healthy, and the way the act is performed (Van Esterik, 1995). Although childcare has received little emphasis due to the fact that it has rarely been reported as one of the underlying causes of malnutrition (Engle *et al*, 1997), care is increasingly recognized as an important determinant of good health and nutrition among preschoolers, along with food security (both household and individual), availability of and access to health

services and a healthy environment (Kulwa, Kinabo & Modest, 2006:236; Engle *et al,* 1997: v; Ruel *et al*, 1999:1). UNICEF's conceptual framework suggests that not only is food security and health care services necessary for child survival, but care for women and children is equally important (Engle *et al*, 2000:26). Therefore, it is important to promote children's well-being through exercising utmost care in order to keep them healthy and to protect them from deadly diseases (Sharma and Nagar, 2006:139). For the very young child, good nutrition depends on good care, but for nearly all humans, of all ages, "caring" can help to ensure their well-being (Latham, 1995). Children three to five years of age have some ability to gather food, to select a diet, and to feed themselves (Thompson & Manore, 2005:583), but in most societies children up to about age six years, or school age, are considered to need feeding care (Latham, 1995). Children aged three to five years cannot make wise food choices on their own, so the caregiver, who, in most cases might be the mother, need to choose healthy food for the child, prepare healthy food for the child and ensure that the child eats the food. Although care is closely linked to household food security, the actual amount of food ingested by the young child (three to five years) is determined by care-related feeding behaviours such as food preparation, and the actual consumption of the food (Ramakrishnan, 1995). Food, health and care are all necessary, but none on its own is sufficient for healthy growth and development. All three elements must be adequate in order for children to have the opportunity to be well nourished.

Care can be defined as the provision in the household (mainly by the mother, and daughters and to a much lesser extent by the father) and in the community (e.g. by caregivers in the extended families or external institutions such as day-care centers) of time, attention, and support to meet the physical, mental, and social needs of the growing child and other household members (Engle *et al,* 1997:1; FAO as quoted in Sayed, 2002:7). In general, care encompasses all measures and behaviours that translate available food and health resources into good child growth and development. For the child, adequate care is important for

survival but also to ensure optimal physical and mental development, and good health (Latham, 1995). Care refers to practices performed by caregivers that affect nutrient intake, health, and the cognitive and psychosocial development of the child (Engle *et al*, 1997:3). According to Engle *et al* (2000:26-27), care refers to the behaviours and practices of caregivers (mothers, siblings, fathers and childcare providers) that provide the food, health care, stimulation and emotional support necessary for children's healthy growth and development. These practices and the ways they are performed are critical to children's survival, growth and development (Engle *et al*, 2000:27). Therefore, care contributes to the child's general well-being and happiness, or what is termed a good quality of life (Latham, 1995).

According to Engle *et al* (1997:2) care practices are exhibited in many domains, namely:

- care for women, such as providing appropriate rest time and increased food intake for pregnant and lactating mothers;
- breast-feeding and **the feeding of young children**;
- psychosocial stimulation of children and support for their development;
- **food preparation and food storage practices**;
- **hygiene practices;** and
- care for children during illness, including diagnosis of illness and adoption of health-seeking practices (home health practices).

Due to the nature of this study, the focus was only on aspects that are bolded, namely: the feeding of young children (pre-school-age children, aged three to five years), food preparation and food storage practices for pre-school-age children (three to five years), and hygienic practices during food handling and preparation and storage (with specific reference to pre-school-age children, aged three to five years). These aspects are critical, because they are care-related behaviours that

determine the actual food consumed by the child and they, in turn, translate available food into good child growth and development.

2.5 CARING CAPACITY

Caring capacity is the ability to perform care behaviours or practices and to use human, economic and organizational resources to the benefit of young children (Van Esterik, 1995:2 of 9). According to the FAO (1997:20 of 26) caring capacity is the ability to use human, economic and organizational resources for the benefit of the household. In general, it includes responding promptly to nutrition needs and nurturing physical, psychological and emotional well-being, which, in turn, will benefit nutrition and health. In nutritional contexts, it involves facilitating the optimal use of household food resources for family feeding (in this case, for feeding pre-school-age children, aged three to five years) and of parental resources to protect the family from infection and to care for a sick child or other vulnerable members of the household (FAO, 1997:20 of 26). Therefore, whether this care could be provided depends on the availability of resources for care at household level. These resources include education, knowledge and beliefs; health of the caregiver; time, autonomy or control over resources (e.g. income) and social support, as well as family economic resources (Engle *et al,* 1997:2). Care is facilitated when, for example, women have access to labour saving devices, income-generating opportunities, and having the knowledge on healthy foods and how to prepare them (Sayed, 2002:7). The provision of care at household level also depends on whether these practices receive support at community, regional, national, and international levels (Engle *et al,* 1997:2). Macharia *et al* (2004:402) also emphasized the importance of encouraging partnerships between communities and government and non-governmental organizations in providing resources for care to improve care practices and consequently the nutritional status of children. Therefore, the caregiver's caring

capacity largely depends on three aspects as related to nutritional outcome, namely:

- resources
- nutrition knowledge
- caring activities.

2.5.1 Resources

Resources refer to material things one can have and use. Care, like household food security, is the outcome of complex processes in society, but it ultimately depends on the availability, accessibility, and use of resources (Jonsson, 1995:2 of 7). In order to perform care practices, the caregiver needs sufficient resources such as education, time and support (Engle *et al*, 1997:3; Engle *et al*, 2000:27). Substantial resources in the form of time and funds (Macharia *et al*, 2004:402) are required to improve care practices and the nutritional status of children. The support that the caregiver needs may be in terms of being given enough money and the authority to decide on the types of food to buy for the child, for example, buying nutritious food that would promote the child's growth and development. Support may also come in the form of having alternative caregivers, such as siblings and members of the extended family to relief or to share the workload with the primary caregiver. This will be of advantage to the caregiver and the child, because the caregiver will have time to take good care of herself and therefore take good care of the child. According to Jonsson (1995: 3 of 7) there are three main types of resources, namely: human, economic, and organizational resources that would aid in child caring practices. For this study, human resources would include the caregiver's education, available time to care for the child, and social support (any help the caregiver receives from alternative caregivers such as members of the extended family, siblings or crèches) received by the caregiver in caring for the child. Economic resources include the family's income (money) that would aid in child-care practices, for example

buying food for the child. Organizational resources include formal and non-formal institutions (e.g. pre-schools or day-care centers or crèches, members of the extended family).

The provision of these resources by family or society can be considered to form part of care for the caregiver (Engle *et al*, 1997:3), which may contribute significantly to children's nutritional status. The care practices and resources for care are not only important for children's nutritional status, but also for their growth and development (Engle *et al,* 2000:27).

2.5.2 Nutrition knowledge

The nutrition situation is worsened by a lack of nutritional information and knowledge in addition to undesirable dietary habits and nutrition-related practices, attitudes, perceptions and socio-cultural influences (Department of Health, 2002a:3-4). Improving nutritional knowledge, behaviour, perceptions and attitudes of the population through nutrition education is one of the broad strategies that have been identified to improve the nutritional status of all South Africans (Department of Health, 2002a:4). Nutrition knowledge and awareness of the public may be increased by providing information on the relationship between diet and health; the relationship between nutritional and health status and individual productivity and national development; the nutritional needs of the population and of individuals; the importance of ensuring the quality and safety of the food supply; the causes and consequences of nutritional disorders; and the benefits of food labeling and legislation (FAO, 1997:1 of 28). Desirable food behaviour and nutritional practices may be promoted by providing information on the nutritional value of foods; the components of an adequate diet; making appropriate food choices and purchases from available resources; hygienic food preparation and handling of food; storage, processing and preservation of food;

and equitable intra-household food distribution according to the nutritional needs of family members (FAO, 1997:1 of 28). According to a study conducted in rural Bangladesh by Kumar-Range, Naved & Bhattarai (1997: 2of 2), a mother's access to information on nutrition and child care, primarily through radio programs, clearly raised the level of her children's nutrition and this factor was far more important than her level of formal education. A study conducted by Kaul and Abrol as quoted by Sharma and Nagar (2006:141) revealed that educated mothers were supposed to have better knowledge of hygiene and health needs and practices (which all contribute to the child's growth and development), but this was not always the case, due to lack of proper facilities such as basic education (relating to childcare), income, and access to mass media, which might affect their knowledge and practices. Therefore, mass media play a very important role in promoting good care practices, which, could positively contribute to the growth and development of children.

To attain good health and nutritional status, people need sufficient knowledge and skills to grow, purchase, process, prepare, eat and feed their families a variety of foods in the right quantities and combinations (Department of Health, 2002a:4; FAO, 1997:5 of 28). This requires a basic knowledge of what constitutes a nutritious diet and how people can best meet their nutritional needs from available resources. Undesirable food habits and nutrition-related practices, which are often based on insufficient knowledge, traditions and taboos or poor understanding of the relationship between diet and health, can adversely affect nutritional status. However, people can adopt healthier diets and improve their nutritional well-being by changing their food and nutrition attitudes, knowledge and practices, if sufficient motivation is provided to do so. The results of a study conducted by Sharma and Nagar (2006) in two rural villages of India revealed that after giving proper education to mothers (on aspects of childcare), the majority of the mothers indicated that their practices with regard to childcare (specifically feeding practices) were not good and the education helped to negate their wrong beliefs and poor care practices. Therefore, proper education (for

example, providing the right kind of information with regard to good care practices) can bring about many changes in people, more appropriately so in the case of women ─ when one woman is educated, then the whole family is educated (Sharma & Nagar, 2006:14). Various researchers (Kandiah & Jones, 2002; Faber & Benadé, 2002) reported similar findings whereby children and caregivers who received proper nutrition education changed their attitudes or poor practices with regard to food choices, preparation and consumption. Therefore, disseminating the right kind of nutrition information or messages would definitely make a difference in improving the nutritional status of children.

The provision of correct information is not in itself a sufficient objective to improve nutritional status, but it goes beyond the simple accumulation of knowledge, towards positive action. In a study conducted in rural Bangladesh, Kumar-Range *et al* (1997) found that the best-nourished children came from families that had knowledge of good hygiene practices, practiced good hygiene, and trained their children in such habits. For the purpose of this study, nutrition knowledge refers to information and understanding that the caregiver has with regard to hygienic food handling, preparation and storage, and ensuring that the child is provided with, and actually eats healthy foods, for the benefit of the child's growth and development. Because the caregiver make food choices for the pre-school-age child, it is important that she receives adequate nutritional advice for the child, so as to ensure proper growth and development of the child.

2.5.3 Care-giving activities/ practices

Care-giving activities or practices are the acts or practices that create relationships between people (in this case, the child and the caregiver). Specific care-giving for children aged three to five years includes providing security and reducing child stress; providing shelter and clothing; feeding, bathing and supervision of toilet habits; preventing and treating illness; showing affection;

interaction and stimulation; playing and socializing; and providing a safe environment for exploration (FAO, 1997:20 of 26). It also includes the use of resources outside the home, such as curative and preventive health facilities, traditional healers or members of extended family network. Adequate dietary intake and health status (which is the positive part of the UNICEF conceptual framework on nutrition) are the immediate determinants of good nutrition, but caregiving ultimately determines the delivery of adequate food and health to the child (Ramakrishnan, 1995:2 of 10).

Even when poverty causes food insecurity and limited health care, enhanced caregiving can optimize the use of existing resources to promote good health and nutrition in women and children (Engle *et al*, 2000:26; Ramakrishnan, 1995:1 of 10). Care of the mother, either by herself or by her family, assisted by social support in the community and by the social services network, will have a direct effect on her ability to care for the children (FAO, 1997:20 of 26). The way in which the care-giving activities are performed (the quality of care) is an important aspect of care: the caregiver's motivation, skill, physical capacity, consistency and responsiveness to the child's needs are all related to child survival, health and development (FAO, 1997:20 of 26). Care-giving activities or practices for children includes feeding practices (in this study it refers to the manner in which the child is fed during the day, including the types of foods, timing of feeding, meal frequencies and termination of feeding), kinds of foods (refers to different food items eaten by the child), food preparation (in this study it refers to the cooking of food and getting it ready to be eaten), and food storage (in this study it refers to the manner in which food is kept before and after preparation).

2.6 ASSOCIATION OF CARE PRACTICES AND NUTRITION KNOWLEDGE

Malnutrition can occur even when a household has access to adequate amounts of nutritious foods as well as access to sanitation and health services. While

adequate incomes, greater food availability, and expanded health services are necessary for adequate nutrition, these would not bring about improvements unless households are able to take advantage of them (FAO, 1997:5 of 28). In this context, sufficient knowledge and the ability to care for vulnerable individuals (discussed under 3.2 to 3.3) are of critical importance. According to Latham (1995:6 of 10) the relationship between care and nutrition is stronger for those who depend on others for feeding (pre-school-age children included) and for other actions that contribute to nutritional well-being.

The study conducted by Ruel *et al* (1999:18) in Accra showed that care practices are strong determinants of children's nutritional status, and particularly so for children from poorer households and children of mothers with less than a secondary school education. In other words, mothers who are poor and have less than a secondary school education can improve their children's nutritional status by providing good care practices. Therefore, good care practices could compensate for the negative effects of poverty (that is low maternal education and insufficient income) and could thus improve the nutritional status of children. In a study conducted in rural Lesotho, the effect of maternal schooling was mediated through increased nutrition knowledge (and probably better care practices), but only among households that had access to a minimum level of resources (Ruel *et al*, 1999:20). This study indicated that poor mothers cannot translate nutrition knowledge into optimal child-care practices (Ruel *et al*, 1999:20). Therefore, without a minimum level of resources, positive action will not be taken. Differences in absolute levels of poverty between Accra and Lesotho are probably responsible for the contrasting results (Ruel *et al*, 1999:21).

Nutrition knowledge is important for caregivers to care for children properly. According to Sharma and Nagar (2006:139) poor knowledge on the part of mothers, who traditionally always took the responsibility of caring for children, can lead to disastrous results in the field of care giving. The caregiver should

have nutritional knowledge to enable her to include adequate amounts of food from all the food groups in the child's diet to meet the child's nutritional requirements. Knowledge of appropriate food preparation practices is also important, so that food can be handled and cooked in a manner that will prevent nutrient losses (Krige & Senekal, 1997:22). It is recommended that nutrition education should form an important part of any intervention programme to improve the nutritional status of children and other target groups. Nutrition education directed to mothers and caregivers is important in improving the nutritional status of young children. Caregivers at day-care centres and at home should have increasing knowledge of nutrition so that they can help to improve the growth and well-being of children. Sharma and Nagar (2006:141) are of the opinion that if mothers are given proper knowledge and scientific education of child care practices, such as nutrition, health, children's growth and behaviour, it is imperative they would exercise their knowledge on children, thereby reducing the incidences of faulty fads and beliefs, and rearing their children in an environment that promotes growth and positive development. Engle *et al* (1997:24) state that nutrition education programs should target fathers for education; because in most cases they are the main decision-makers about household resources (e.g. income) and they are important as a source of emotional and informational support.

The linkage between resources, nutrition knowledge and caring activities is stronger than each of these on their own, since the one depends on the other. For example, in order for the caregiver to translate nutrition knowledge into optimal child-care practices, she should have at least a minimal level of resources, but she should also know which resources are needed, which care practices are critical to the child, and how they should be performed. Therefore, nutrition knowledge and the availability of resources will determine the type of care the children will receive, because of its impact on the nutritional caring capacity of caregivers of pre-school-age children. Bouis and Hunt (1999:168) state that the role of women is central to nutrition outcomes through childcare, so

that policies and programs must consider how to enhance women's decision-making power in the household, how they affect time demands on women, and how to increase women's education and nutrition knowledge. As Latham (1995:6 of 10) stated that there is a strong relationship between care and nutrition for those who depend on others for feeding and for other actions that contribute to nutritional well-being, it was therefore crucial to conduct this study which investigated the caring capacities of caregivers of pre-school-age children.

2.7 SUMMARY

Nutrition security is influenced by a wide range of complex and interrelated factors, which must be addressed holistically because they are all essential to attain good nutritional status. Good care practices and improved nutrition knowledge of caregivers along with food security, access to health services and a healthy environment play a crucial role in promoting the survival, growth and development of children (with specific emphasise on pre-school-age children who are the focus of this study). In order to carry out good caring practices or activities, the caregiver needs at least a minimum level of resources such as human, economic and organizational resources. These resources must be available and accessible to the caregiver so that they can be utilised to benefit the child.

CHAPTER 3: RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter outlines the methods and procedures followed to investigate the research problem. It starts by outlining the research problem as well as sub-problems, which were formulated for this study. The sub-problems are clearly indicated in the conceptual framework for this study. The measuring instruments which were used for this study are also outlined in this chapter. The research design, population and sampling method chosen for this study are discussed, as well as the procedure, data collection, and data analysis methods.

3.2 RESEARCH PROBLEM AND SUB-PROBLEMS

The research problem for this study is as follows: “What are the caring capacities of caregivers of pre-school-age children (aged three to five years)?”

The following sub-problems were formulated to help to investigate the research problem:

3.2.1 What are the resources for care that caregivers of pre-school-age children use as part of caring capacity?

- Which human resources do the caregiver have available to care for the pre-school-age child?
- Which economic resources do the caregiver have available to care for the pre-school-age child?
- Which organizational resources do the caregiver have available to care for the pre-school-age child?

3.2.2 What is the nutrition knowledge of caregivers of pre-school-age children as part of caring capacity?

- Which knowledge does the caregiver have on the components of a nutritious diet?
- Which knowledge does the caregiver have on appropriate food choices for the pre-school-age child?
- Which knowledge does the caregiver have on hygienic food handling, preparation and storage?

3.2.3 What are the caring activities that caregivers of pre-school-age children use as part of caring capacity?

- Which kind of foods does the caregiver give to the pre-school-age child to contribute to the nourishment of this child?
- Which food preparation methods does the caregiver undertake to contribute to the nourishment of the pre-school-age child?
- Which food storage methods does the caregiver undertake to contribute to the nourishment of the pre-school-age child?
- Which feeding practices does the caregiver undertake to contribute to the nourishment of the pre-school-age child?
- What other child care activities does the caregiver undertake as part of her caring capacity?

3.3 CONCEPTUALISATION

The conceptual framework for the study is presented in figure 3.1. The conceptual framework shows the importance of the concept of care (of children), which is a multidimensional concept, to the overall growth and development of the child. For the purpose of this study, the framework indicates that the

caregiver's caring capacity mainly depends on the availability, accessibility and use of resources so that she can translate nutrition knowledge into good caring activities to the benefit of the child (aged three to five years). The lower parts of the conceptual framework do not form part of the research problem for this study, but it is important to show that the caregiver's caring capacity (including the three related aspects, namely, resources, nutrition knowledge and caring activities) will in turn lead to the child's physical, psychological and emotional well-being and ultimately optimal growth and development (which do not form part of this study).

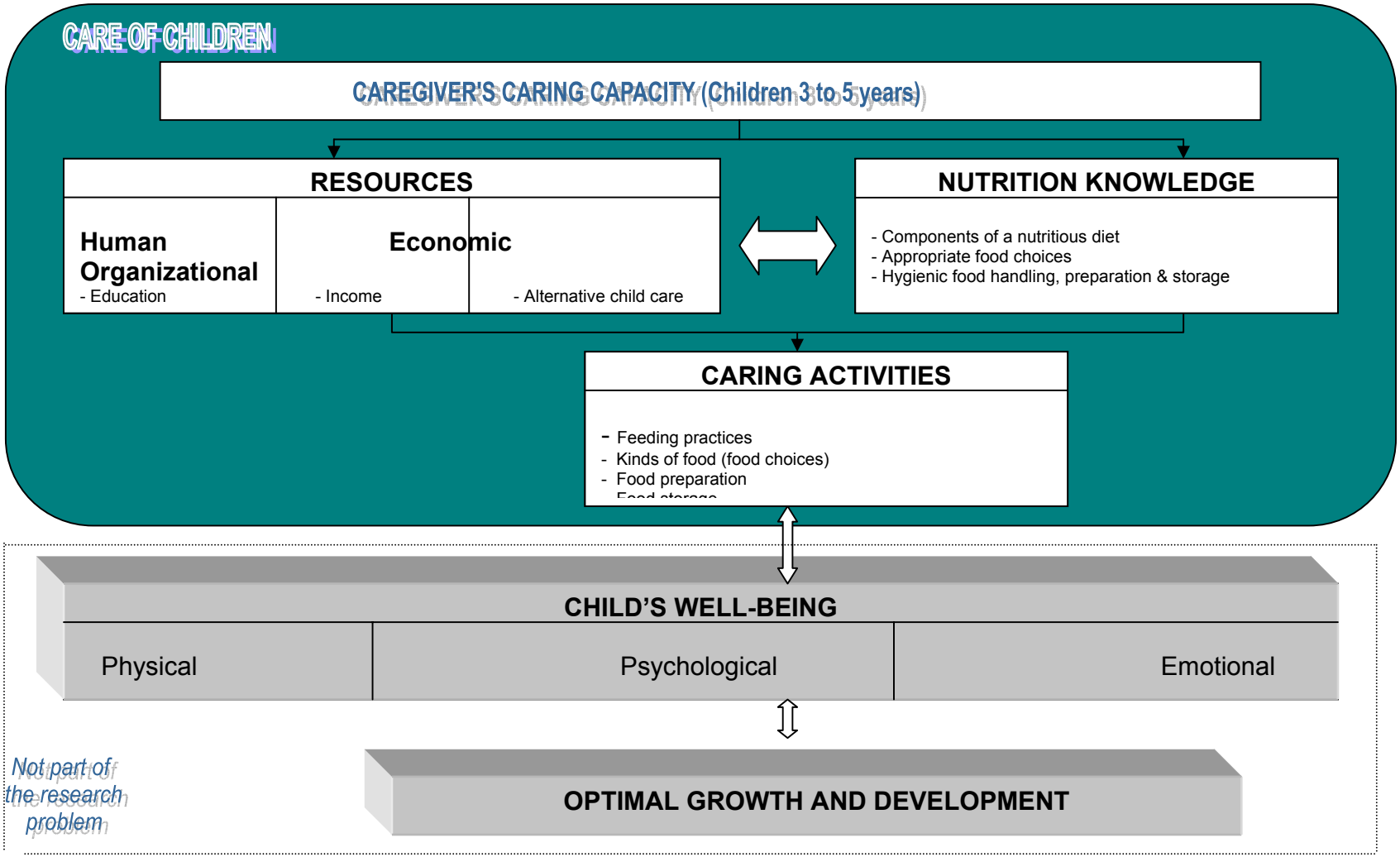


FIGURE 3.1: CONCEPTUAL FRAMEWORK OF THE STUDY

3.4 MEASURING INSTRUMENTS

In order to collect data, some form of measuring instrument has to be used (Mouton, 2001:100). For this study, a questionnaire was designed and used as a measuring instrument. Mouton (2001:103) highlighted the most common errors in questionnaire construction that must be taken into consideration. Efforts were made to combat some sources of error such as avoiding ambiguous or vague questions, avoiding double-barreled questions, placing questions in the right sequence, avoiding leading questions and avoiding sensitive or threatening questions.

After several consultations with experts and statisticians, a pilot study was conducted to test the questionnaire. The pilot findings were that the questionnaire was too long and took too much time to be completed. It was also found that some questions were repeated, though the wording was different and they had to be eliminated to reduce the length of the questionnaire and the time to complete it. According to Mouton (2001:104) research has shown that the length of a questionnaire has a direct and often negative impact on the quality of the responses. This is true because if the questionnaire takes too much time to complete, it makes the respondents tired and may cause them to give incorrect responses. All the comments (after the pilot study) were taken into consideration and the questionnaire was adjusted accordingly.

The final questionnaire (as shown in Addendum A), which was used during data collection, was divided into four sections. The first section covered the biographic information of the mother of the child as the caregiver, biographic information of the caregiver other than the mother and the biographic information of the child. The second section consisted of questions that elicited information regarding the caregiver's caring capacity of the pre-school-age child with special reference to resources for care (available and used resources) and caring activities that would benefit the child. The third section consisted of a nutrition knowledge test which

was compiled from various previously used nutrition knowledge tests to test the caregiver's nutrition knowledge (components of a nutritious diet, appropriate food choices, and hygienic food handling, preparation and storage) as part of caring capacity of the pre-school-age child. The last section of the questionnaire consisted of questions regarding caring activities such as supervision of the child while eating, monitoring with whom the child eats and elimination of distractions during eating. Furthermore, it included the 24-hour recall form, which probes the respondent to recall all the foods and drinks consumed in the previous 24 hours to determine the child's usual food intake (Lee & Nieman, 2003:77). This was used only to provide information on the feeding practices, the kinds of foods the child ate as well as the frequency of meals in a day, and not for a nutritional analysis of the diet.

3.5 RESEARCH DESIGN

A quantitative research approach, with qualitative aspects was implemented to attempt to answer the research problem. This research study was conducted as a survey research design, which is the administration of questionnaires to a sample of respondents selected from some population (Babbie & Mouton, 2001:265). Surveys are used in studies that have individual people as the unit of analysis or where some individual persons must serve as respondents or informants (Babbie & Mouton, 2001:232). For example, in this study, the caregiver served as an informant. The strengths of this design are that it is useful in describing the characteristics of a large population; it allows the researcher to ask many questions on a given topic, giving considerable flexibility in data analysis; and it allows the researcher to develop operational definitions based on actual observations (Babbie & Mouton, 2001:263). An empirical research design was used to collect primary data about the pre-school-age children living in a poor peri-urban community. The research purpose was descriptive in nature, and used various measuring instruments to collect data. Data was gathered through

the use of a questionnaire (including the 24 hour recall form) to interview respondents and to make observations. A cross-sectional research design was implemented, as the study was based on observations representing a single point in time (Babbie & Mouton, 2001: 641).

3.6 POPULATION AND SAMPLING

The study population and the sample were the caregivers of pre-school-age children living in a selected poor peri-urban community with limited access to resources. The observation unit, which refers to an element from which information is collected (Babbie & Mouton, 2001:174), was the caregivers of the children because they were interviewed to collect information regarding the unit of analysis (pre-school-age children). These are also referred to as data sources or key informants (members of the group who can talk directly about the group per se) (Babbie & Mouton, 2001:168).

The technique used to select the sample for this study was convenience or accidental sampling, which is a non-probability sampling technique. Convenience or accidental sampling takes the units as they arrive on the scene or as they are presented to the researcher by chance (Leedy, 1993:200). It is based upon convenience in accessing the sampling population. According to Kumar (1999:161-162) this sampling technique is the least expensive way of selecting a sample, it does not require any information such as a sampling frame, the total number of elements, their location, or other information about the sampling population; and it guarantees the inclusion of the type of people the researcher need. The disadvantage of this sampling technique was that the findings couldn't be generalised to the total sampling population because the sample was not representative of the population (Leedy, 1993:200; Kumar, 1999:161; Bless & Higson-Smith, 2000:92).

With the help of the people at the King's Hope Development Foundation, which is situated in the research area (Olievenhoutbosch), the researcher was given the opportunity to visit a crèche and a few households with pre-school-age children so as to include their caregivers in the sample. It was through the "Dimphonyana Tsa Lapeng" crèche where the researcher had the advantage to find a bigger sample of caregivers who were willing to participate in the study. The two caregivers at the crèche were interviewed about the children they cared for and later they informed the mothers of the children about the research. The mothers were willing to participate in the study and asked the caregivers at the crèche to invite the researcher to a parents' meeting, which was well-attended. Only the mothers of the pre-school-aged children were included in the study. Some children did not attend the crèche, but their mothers were interviewed at their homes as they were willing to take part in the study. The sample included pre-school-age children of both genders (males and females) receiving care at various settings, for example, at home or crèche. Different caregivers such as the mother and the caregiver at a crèche were interviewed.

With the help of statisticians, the sample size was set to be fifty (50). Therefore, two caregivers at the crèche were interviewed on how they cared for forty-five (45) children, whereas fifty mothers were interviewed on how they cared for their children at home. The difference in the number of respondents is that five children did not attend crèche at the time of the interview.

3.7 PROCEDURE AND DATA COLLECTION METHODS

3.7.1 Procedure

Permission was obtained from the crèche as well as the parents of the children to gather information from them. The researcher first gave an explanation of the research and informed respondents of the purpose of the research. The respondents were allowed to ask questions regarding the study.

3.7.2 Ethical considerations

Before the research was conducted, approval was obtained from the ethical committee of the University of Pretoria. Ethical considerations with regards to the rights of respondents were applied when collecting data (Kumar, 1999:190-196; Bless & Higson-Smith, 2000:100). For example, respondents were not forced to participate. For this study, informed consent (see Addendum B) was obtained from each adult caregiver as was done by Kerr, Berti and Chirwa (2007:92) to show that they were participating out of their own free will. According to Kumar (1999:192) informed consent implies that subjects are made adequately aware of the type of information the researcher wants from them, the reasons for seeking information, the purposes the information will serve, how the subjects are expected to participate in the study, and how the study will directly or indirectly affect them. The researcher applied all of the above before data collection. For this study confidentiality and anonymity (no names will be mentioned) were ensured by the researcher and the information will only be used for the stated purpose of the research.

3.7.3 Data collection methods

- **Gaining access**

A visit was made to King's Hope Development Foundation (situated in Olievenhoutbosch) in December 2005. The purpose of the visit was to make the people aware of the research study to be conducted and to gain entry to the community so as to get respondents. The first visit was very fruitful as some of the mothers doing voluntary work at King's Hope Development Foundation were willing to participate in the study. A second visit followed in January 2006 and the researcher was taken to a crèche in the community and introduced to the principal of the crèche. The study and its purpose were explained to the crèche

principal and permission was asked to involve the children at the crèche. All went very well as the crèche principal also helped to involve the mothers of the children at a later stage so that they can become part of the study. A third visit took place in March 2006 when a pilot study was conducted with the mothers of the pre-school-age children working at King's Hope Development Foundation. During this visit it was agreed that the ladies who do home visits in the community will help the researcher by identifying households with pre-school-age children and visiting them so as to recruit the mothers of the children to participate in the study.

- **Data collection procedure and method**

Data collection took place from May until September 2006 in the natural settings of the respondents (i.e. in their homes) and at a place the respondents preferred (i.e. at the crèche). Appointments were made with home-based workers at King's Hope Development Foundation to accompany the researcher to visit the identified households, as they were familiar with the community. Although most identified mothers participated in the study, some refused to participate. Data collection at the crèche was very successful as the researcher arranged with the crèche principal and the parents that the data will be collected from the parents (more especially those who are working) on the day they had a parents' meeting. Some of the mothers were interviewed on other days as they happened to go to the crèche on the days the researcher was there. The meeting was well-attended and the researcher was given permission to start collecting data before the meeting could start. Due to the large number of mothers who were willing to participate in the study, data collection continued until late in the evening. This was done on that day because the mothers are working and that was the only opportunity for the researcher to gather data from as many respondents as possible.

Data was collected by using the structured questionnaire as discussed under 3.4 (see Addendum A). Two sets of questionnaires were used, one to interview the mothers as caregivers and the other one to interview caregivers at a crèche. In other words, for each child who attended the crèche, information about the child was gathered from both the mother and the caregiver at the crèche. The two caregivers at the crèche were interviewed separately on different days to obtain information about how they cared for the pre-school-age child. There were only five children whose mothers indicated that they did not attend crèche at that period and for those children, their information was gathered from their mothers only as they were the only caregivers. Individual face to face interviewing, as one of the data collection methods was used to collect data from the respondents. This helped the researcher to acquire information verbally and directly from respondents. Although this method was time consuming the researcher had to interview the respondents individually and at different times to ensure reliable and valid information. Therefore the respondents did not influence each other. This also gave the researcher an opportunity to probe for answers when necessary. The researcher read each question in the languages of the respondents and the respondents gave verbal answers which were recorded on the appropriate places on the questionnaire. Each questionnaire was checked thoroughly after each individual interview to make sure that each and every question was answered.

There are three main kinds of observation effects that are sources of error during data collection, namely, effects associated to the researcher, the respondents and the research context (Mouton, 1996:149). For example, researcher effects such as the affiliation with a specific organisation, the image of the researcher, the difference between the researcher and the respondents, and the researcher orientations may have a biasing effect on the information obtained (Mouton, 1996: 149-150). These sources of error need to be minimised. In this case the interviewer was affiliated to the University of Pretoria, which has a good reputation and this motivated respondents to take the study seriously and answer

all questions. Sensitive questions were not asked and the interviewer did not make predictions about the responses of the respondents nor was influential in the manner in which respondents responded. The researcher's affiliation to a university, which is highly respected by most people, could have positively influenced the respondents to take part in the study and to be more honest when they answered questions. The researcher tried her best to make the respondents not to be threatened by her affiliation to a university, but to be free and as honest as possible when answering the questions.

The fact that human beings tend to be highly reactive when directly involved in research poses problems in terms of validity and reliability of the information given. When human beings are aware that they are being investigated, they tend to react to this and they may supply inaccurate information or modify information to create a better impression (Mouton, 1996:141). Respondents were encouraged to be honest when providing information. Respondents were not forced to answer questions or to remember things that they forgot. Subtle probing was used to help respondents to answer questions when deemed necessary. Some simple observations during the interviews were done to aid in enriching data, as the interviewer could also observe the respondents' general reaction to questions or probes. The researcher also depended on secondary data (existing research results from additional research studies conducted on the same group, e.g. studies conducted by Krige and Senekal, 1997; Engle *et al*, 1997; Kumar-Range *et al*, 1997; Ruel *et al*, 1999; Engle *et al*, 2002; Sharma and Nagar, 2006 as discussed in chapter 2) and field notes taken during data collection.

Two important sources of error with regard to respondents were encountered during data collection, namely; refusal to participate and inaccurate responses or demand characteristics. According to Mouton (2001:106) subjects refuse to participate because of "over-surveying" of certain populations, untimely interviewing times that infringe on respondents' privacy, sensitive topics, over-lengthy questionnaires and many other reasons. The shortcoming of this study in

terms of data collection was that some respondents refused to participate because they felt that the timing was bad as they were busy with other household chores and they did not show any interest when the researcher wanted to arrange suitable times with them. The responses of these few respondents would have contributed a lot to the results of this research. Mouton (2001:107) states that inaccurate responses or demand entails that participants may produce responses that they think the researcher wants. For example, some of the young mothers under the age of thirty-five (35) mentioned that they would choose butter over sunflower oil for frying the child's food, but when the researcher probed further it became clear that these mothers wanted to impress the researcher by mentioning expensive food items. The research setting was another source of error that needed to be controlled. Therefore the research was conducted in the setting of the respondents where they were comfortable, with their full permission, and at times that suited them. None of the respondents were forced to take part in the research.

- **Data capturing and data editing**

The questionnaire consisted of both textual and numeric data. Due to the fact that textual data are rich in meaning and difficult to capture in a short and structured manner (Mouton, 2001:108), data were coded to simplify data capturing. Data were captured using Microsoft Excel program. Due to the fact that data were captured manually from questionnaires, there were some human errors that occurred (Mouton, 2001:109). According to Mouton (2001:109) it is imperative that validation checks (such as reliability analysis of questionnaire responses) be applied. To counteract this error, the researcher was given an opportunity to validate the captured data. Errors were identified and rectified and the data was checked again until the researcher was satisfied that everything was correct according to the responses of the respondents.

3.7.4 Data analysis

The data were analysed by a statistician from the University of Pretoria using appropriate statistical methods such as descriptive statistics, using the SAS computer program. According to Bless and Higson-Smith (2000:137) quantitative data is often analysed using a range of descriptive and inferential statistical procedures. Descriptive statistical techniques are concerned with organising and summarising the data at hand, to render it more comprehensive (Mouton, 1996:163, Huysamen, 1998:4). Descriptive statistics help in arranging numerical data in an orderly and readable manner (Terre Blanche & Durrheim, 1999:120). Huysamen (1998:4) states that the purpose of descriptive statistics is to reduce large amounts of data physically to facilitate the drawing of conclusions about them. Therefore, the data will be presented in the form of tables and or graphs in the next chapter. Inferential statistical procedures are designed to determine whether relationships exist between variables in the population generally (Terre Blanche & Durrheim, 1999:120). For this study, the relationship between nutrition knowledge and some aspects of care was tested using the Fisher's Exact test.

3.8 THE QUALITY OF THE DATA COLLECTED

The quality of the research was evaluated against the validity framework of Mouton (1996:111). The framework is based on the stages of the research process; sources of error and the methodological strategy that was taken to ensure validity.

3.8.1 Validity

Validity was ensured during three stages in this research process: conceptualization, operationalisation and data collection. In terms of conceptualization, theoretical validity was built in through a thorough literature review, clear and logical definitions of the key concepts of the study (e.g. care,

caring capacity, resources, nutrition knowledge, caring activities, caregiver and pre-school-age child) and presentation of a full range of dimensions and indicators of the variables that were measured in this study. Regarding operationalisation, face validity was incorporated by using dimensions and indicators of the variables to construct interview questions. Content validity was incorporated into the questionnaire which was used during data collection. The questionnaire had sections which asked questions on different components of the aspect of care in order to answer to the research question. The questions were formulated from the main concepts and their relationships as shown in the conceptual framework of the study.

3.8.2 Reliability

Reliability, in this study, was ensured by attempts to combat sources of error during data collection, namely, researcher effects, observation effects and context effects. This was achieved through the use of more than one method of data collection such as a questionnaire, the 24 hour recall of dietary intake and simple observations. According to Mouton (1996:156) triangulation, which refers to the use of multiple methods of data collection in a research project, is likely to increase the reliability of observations. The underlying assumption is that, because various methods complement each other, their respective shortcomings can be balanced out (Mouton, 1996:156). In order to ensure reliability, a competent, trustworthy and properly trained interviewer (in this case, the researcher herself) was used during data collection. In order to ensure reliability of the data, the interviewer followed appropriate methodological criteria such as suspension of personal prejudices and biases, systematic and accurate recording of the observations, establishment of trust and rapport with each respondent and creating optimal conditions in terms of location or setting for the collection of data.

3.8.3 Limitations and gaps in the data

The study was restricted to only one peri-urban community with a limited number of respondents (N=50). Although the respondents were from different cultural groups, the study was conducted at a particular geographical area (Olievenhoutbosch). The limitations of this study are due to limitations in time, budget and the nature of this study, which is a script.

The study would have yielded interesting results if different types of caregivers (other than the child's mother and the crèche caregivers) were included as key informants. Another limitation is the nutrition knowledge test that was used to test the nutrition knowledge of this particular group. A validated nutrition knowledge test that suited the respondents who had no nutritional background or nutrition education taught at school would have yielded more information.. The measuring instrument or the questionnaire used was limited to questions on resources for care, caring activities and/ or practices and nutrition knowledge, but touched very little on hygienic aspects which are also very important determinants of childcare.

CHAPTER 4: PRESENTATION AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This chapter documents the results of the study as obtained from the statistical analysis of the responses given by the respondents. The results are summarized in tables and graphs for easy interpretation and understanding. This chapter first presents the results and then the discussion thereof.

4.2 PRESENTATION OF RESULTS

This section presents the results of the data gathered from the mother-caregiver and the crèche caregivers. This is because both the mothers and the crèche caregivers were interviewed about how they cared for the pre-school-age child. The results are categorized into four main sections, namely, biographic information of caregivers; child information; resources for care and nutrition knowledge.

4.4.1 Biographic information of the caregivers

The word ‘caregivers’ in this case include both mothers and crèche caregivers unless otherwise specified. The various ages of the caregivers are given in Table 4.1. It is important to take note that ‘frequency’ in each table in this chapter refers to the number of times a certain choice was made or the number of respondents (caregivers) who made a certain choice.

TABLE 4.1: AGE OF CAREGIVERS IN YEARS

Age category (years)	Mothers		Crèche caregivers	
	Frequency n = 50	Percentage (%)	Caregiver one	Caregiver two
22 – 30	25	50%		
31 – 40	21	42%	**X**	**X**
41 – 50	3	6%		
51 – 54	1	2%		

X = both the crèche caregivers fall under the age category 31 – 40.

Almost all mothers (n=46, 92%) were younger than 40 years with the average age being 33 years. One respondent was 54 years old, however, she is the child's grandmother, and the child stays with her while she takes full responsibility like a mother would. Therefore, for the purpose of this study, this grandmother was regarded as the child's mother. The one caregiver was 31 years old (further referred to as caregiver one), whereas the other caregiver was 32 years old (further referred to as caregiver two).

A large proportion (n=30, 60%) of the mothers who participated in this study were not married but living with a partner. Few (n=11, 22%) of the mothers were married and the least of the mothers were unmarried or separated and without a partner. The highest educational level of the child's parents as well as the caregivers at the crèche is given in Table 4.2.

TABLE 4.2: EDUCATIONAL LEVEL OF THE CHILD'S PARENTS AND THE CRÈCHE CAREGIVERS

Highest educational level	Mothers (%) N = 50	Fathers (%) N = 50	Caregiver one	Caregiver two
Standard 1 – 5 (grade 3 – 7)	12%	2%		
Standard 6 – 8 (grade 8 – 10)	24%	12%	**X**	
Standard 9 – 10 (grade 11 – 12)	48%	38%		**X**
Standard 10+ (grade 12+)	16%	26%		
Do not know		22%		

X = highest educational level category of the caregivers

A majority of the mothers had completed secondary school education and had a matric certificate (standard 10) compared to most of the fathers who had a standard ten and higher education. Mothers did not always know the highest educational level of their children's fathers. It is therefore clear that in this community mothers were mostly less educated than the fathers. Caregiver two had a matric certificate whereas caregiver one had standard eight as her highest educational level.

A higher percentage (n=26, 52%) of the mothers worked outside the home (see Table 4.3).

TABLE 4.3: PARENT'S OCCUPATION

Type of job	Mothers Frequency (n= 26)	Fathers Frequency (n = 44)
Domestic work at other people's home	14	0
Work at a firm (private sector)	2	17
Cleaning services	3	1
Customer services (retail stores)	3	3
Security officer	0	8
Farm laborer	0	1
Construction work (building, painting etc.)	0	5
Other (specify)	4	9

Most of the employed (n=26, 52%) mothers did domestic work at other people's homes and least worked in the private sector. Only four mothers indicated that they did other formal jobs such as auxiliary nursing, community health work and accounting office work. A large number of the children's fathers worked in the private sector (i.e. at a firm) and the least did informal jobs such as cleaning services and farm laborers. Other jobs done by the children's fathers were taxi owner/drivers, cash loan services, mechanical work, motor vehicle repair, electrician, truck driver and advertising consultants. However, some mothers had no contact with the children's fathers anymore.

The mothers had other sources of income that came into the household (Table 4.4).

TABLE 4.4: OTHER SOURCES OF INCOME

Other source of income	Frequency (N = 50)	Percentage (100%)
Child support grants	36	72%
Grandparents' pension funds	1	2%
None	13	26%

Social security grants (child support grants and old age pension given by the government to those complying with guidelines) supplemented the mothers' income that contributed to child care. Only 26% (n=13) of the mothers did not have any additional source of income that came into the household except the income they earned. The control of household income that's allocated for child care is presented in Table 4.5.

TABLE 4.5: CONTROL OF HOUSEHOLD INCOME ALLOCATED FOR CHILD CARE

Person in control	Frequency (N = 50)	Percentage (100%)
Mother	35	70%
Father	4	8%
Grandparent (grandmother)	1	2%
Other (specify): joint control	10	20%

A higher percentage (n=35, 70%) of mothers controlled the household income that is allocated for child care. A joint control of household income that is allocated to child care by both parents was only apparent in a few households (n=10, 20%).

The number of children mothers cared for are presented in Table 4.6.

TABLE 4.6: NUMBER OF CHILDREN IN MOTHERS' AND CRÈCHE CAREGIVERS' CARE

Number of children	Number of caregivers	
	Mothers	Crèche caregivers'
	Frequency (N=50)	Frequency (N=45)
1	13	
2	17	
3	15	
4	5	
18		1
27		1

At household level, mothers cared for one to four children, with a mean of two to three children. The crèche caregivers initially cared for 56 children between three to five years of age since January 2006. However, during the time of the study, this number reduced to only 45 pre-school-age children being cared for at the crèche due to dropouts (11). Caregiver one indicated that she cared for 30 children whereas caregiver two cared for 26 children, but at the time of the study, the number of children was reduced from 30 to 27 (children of ages 36 to 54 months) and from 26 to 18 children (children of ages 55 to 70 months) with more females than males. The crèche operated from 06h30 to 17h30 for five weekdays only. Some children have been attending the crèche for a longer period (i.e. for 18 up to 41 months) whereas others attended only between five and sixteen months.

All the mothers (n=50, 100%) indicated that they needed child care facilities such as crèches or pre-schools for various reasons (see Table 4.7).

TABLE 4.7: REASONS FOR THE NEED FOR CHILD CARE FACILITIES

Reason	Frequency (N = 50)	Percentage (%)
Category 1: Educational		
To prepare the child for formal schooling or to teach the child to read and write	22	44%
To educate the child	10	20%
Category 2: Care & safety		
To take care of the child while the mother is at work or looking for a job	18	36%
To ensure that the child is safe and well cared for	4	8%
Category 3: Development		
To enable the child to develop with kids of his/her own age	4	8%
To enable the child to play with other children	2	4%
Category 4: Moral values		
To teach the child to respect other people and to differentiate between right and wrong	1	2%

Most mothers needed child care facilities for educational reasons (n=32, 64%) and proper care and safety (n=22, 44%). It is surprising that one mother needed child care facilities so that her child could learn respect and moral behaviour. A child should rather learn respect and moral behaviour from his/her parent(s).

4.2.2 Child information

Both genders were fairly equally distributed in this sample (see Figure 4.1). All the children in the study were between three (3) and five (5) years old.

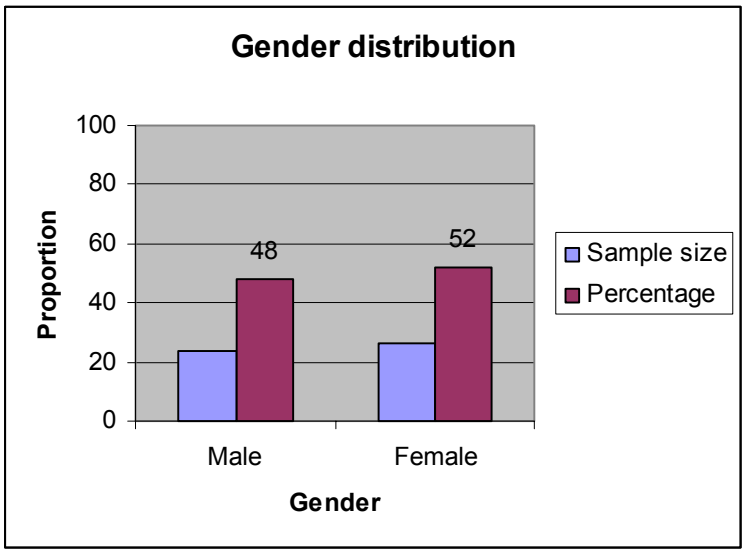


FIGURE 4.1: GENDER DISTRIBUTION

The ages of the children ranged from 37 to 68 months and the average age was 51 - 52 months. The child's position in the household ranged from being the only child to being the eldest child (see Table 4.8).

TABLE 4.8: CHILD'S POSITION IN THE HOUSEHOLD

Child's position	Frequency (N = 50)	Percentage (100%)
Eldest	3	6%
In-between	11	22%
Youngest	26	52%
Only	10	20%

Most of the children (n=26, 52%) involved in the study were the youngest in their households and few (n=3, 6%) children were the eldest, indicating more families with several children. The total number of children under six years of age in the child's household (excluding the child involved in the study) ranged from zero to four (see Table 4.9).

TABLE 4.9: TOTAL NUMBER OF CHILDREN UNDER 6 YEARS

Total number of children	Frequency (N = 50)	Percentage (100%)
0	35	70%
1	13	26%
3	1	2%
4	1	2%

Most mothers (n=35, 70%) did not have any child under the age of six excluding the one involved in the study. Several (n=13, 26%) mothers had one child under the age of six excluding the one involved in the study.

The mothers indicated several activities (Table 4.10) that the child does in a normal day.

TABLE 4.10: ACTIVITIES OF THE CHILD AT HOME

Activities	Frequency (N = 50)*	Percentage (100%)*
Play – free play	50	100%
Eat	49	98%
Sleep	49	98%
Write	12	24%
Draw and/or color pictures	10	20%
Read	7	14%
Do poems	7	14%
Singing and dancing	6	12%
Watch television	4	8%
Count numbers	1	2%

*Respondents had more than one choice

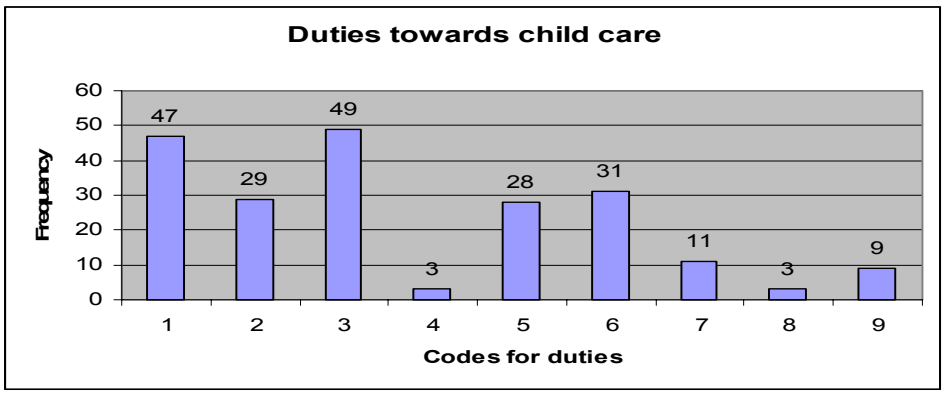
Three activities were mostly mentioned as those the child does in a normal day, namely, playing (100%), eating (98%) and sleeping (98%). Several mothers

(58%) mentioned educational activities such as writing, reading, drawing and/or coloring pictures as part of a child's activities or care on a daily basis. Few children (8%) watched television, probably due to the fact that very few households had electricity or a television set.

The crèche caregivers indicated similar activities for pre-school-age children attending the crèche namely: eating, playing, sleeping, drawing and colouring-in pictures. In addition to these activities, the crèche caregivers' duties towards caring for the younger child (37 – 60 months) included teaching the child to read; pronounce alphabets; count days and months; draw and colour pictures; story telling; self presentation and toilet-training. The older children (61 – 68 months)'s activities included reading, writing, painting and differentiating colours, building puzzles, differentiating body parts, singing, doing traditional dances, and doing traditional poetry.

4.2.3 Resources for care

The mothers had various duties or responsibilities towards caring for the pre-school-age child (see Figure 4.2). The code is the number which was assigned to each duty to facilitate data capturing and analysis.



1= Buy/ provide/ cook food for the child
2= Feed the child/ Supervise the child while eating
3= Bathe and/ or clothe the child/ Wash or change the child's clothes
4= Pay the child's school fees
5= Clean the environment in which the child stays/ Provide a clean and safe
environment (shelter) for the child
6= Play with the child/ Supervise the child while playing
7= Teach the child good behaviour and respect for others
8= Do educational activities with the child (e.g. teach reading, counting & drawing)
9= Do educational activities with the child (e.g. teach reading, writing and poems)

FIGURE 4.2: DUTIES TOWARDS CHILD CARE

Most mothers performed psychosocial care practices such as the provision of food, feeding, cleanliness (i.e. the child's cleanliness; cleanliness and safety of the environment in which the child stays and supervision while the child is eating and playing). Other duties and responsibilities for several mothers included teaching the child good behaviour and respect for others, as well as doing educational activities with the child. If the child got ill, the mother would take him/her to the clinic or to the doctor. At the crèche a sick child was kept in the sick room and the child's parent (s) were informed so that they would attend to the child properly (e.g. take the child to the doctor). Few mothers and the two crèche caregivers treated minor injuries such as small cuts from falling and mothers would also give the child *motswako*, which is a home-made oral rehydration therapy to treat diarrhea.

As part of caring activities, an elderly member of the household, which was in most cases the mother (at home) and the crèche caregiver (at the crèche), supervised the child during meal times to ensure that the child is eating properly. There was no communal sharing of meals (this means that each child ate from his/her own plate) (n=49, 98%), except for one child who usually ate from a communal dish with siblings at home. All the children ate in a room (i.e. in a classroom or a kitchen) which was cleaned daily before and after meal times, with very few (n=2, 4%) children who usually ate in an open space outside the house.

In addition to caring for the child, the mothers also had other responsibilities (see Table 4.11).

TABLE 4.11: RESPONSIBILITIES IN ADDITION TO CHILD CARE

Responsibility	Frequency (N = 50)	Percentage (100%)*
Cleaning the house	50	100%
Cooking food for other household members	49	98%
Washing dishes	36	72%
Washing and ironing clothes	50	100%
Go to work (outside home)	26	52%
Buy groceries (go shopping)	36	72%
Look for a job	2	4%
Look after a small baby (other than the pre-schooler)	2	4%

*Respondents had more than one choice

Despite caring for the preschoolers, mothers had other responsibilities for which they did not get any assistance in doing. Several mothers (n=14, 28%) got some

help in activities such as washing dishes, and buying groceries. The crèche caregivers' other responsibilities included cleaning the crèche, ordering food, washing dishes and doing administrative work.

Several mothers and the crèche caregivers had resources in the households that could help them to care for the pre-school-age child – including electricity (n=17, 34%) as well as household electrical appliances that could simplify their household chores. Most mothers (n=33, 66%) did not have electricity or household electrical appliances. The various uses of electricity in the household are presented in Figure 4.3.

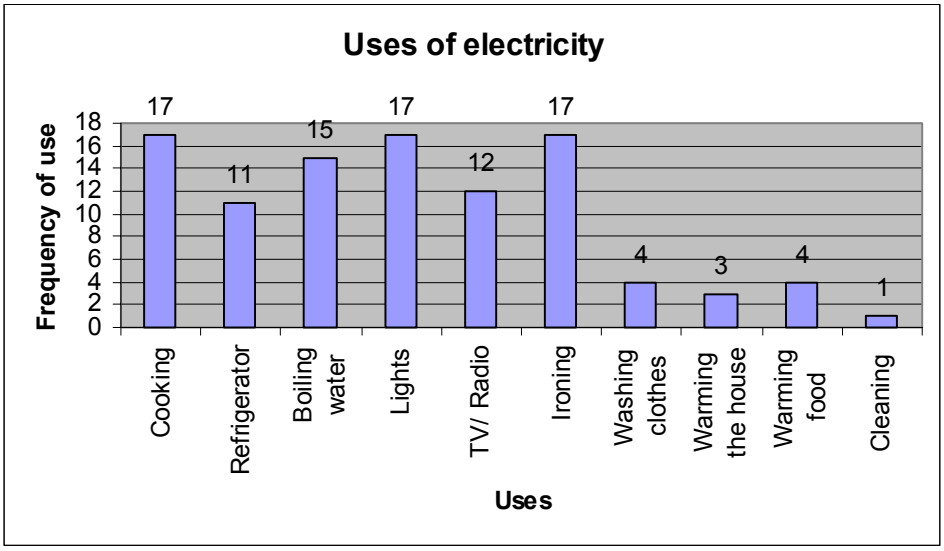


FIGURE 4.3: USES OF ELECTRICITY IN THE HOUSEHOLD

The mothers who had electricity in their households used it mainly for cooking, lights, ironing, boiling water, to operate the refrigerator, television set and / or radio. At the crèche, electricity was used for similar purposes except for ironing clothes. Household electrical appliances that were used by several mothers and the two crèche caregivers to simplify their household chores are presented below (see Table 4.12).

TABLE 4.12: HOUSEHOLD ELECTRICAL APPLIANCES OWNED AND USED

Households		Crèche	How often used
Electrical appliance	**Frequency (N=50)***	**Electrical appliance**	
Stove (1, 2 or 4 plate)	17	X	Daily
Kettle	15		Daily
Iron	17		Weekly
Refrigerator	12	X	Daily
Television set or radio	12	X	Daily
Microwave oven	4		Daily
Washing machine	4		Weekly
Heater	3	X	Seasonally
Vacuum cleaner (Hoover)	1		Weekly

X indicates the type of electrical appliances owned and used at the crèche
* respondents used more than one electrical appliance

Some household electrical appliances were commonly owned and used by the mothers as well as the crèche caregivers. Most of these appliances were used on a daily basis and some were used weekly or seasonally. For example, a heater was mostly used in winter to warm the room (both at home and at the crèche). It is important to take note that although twelve mothers (24%) owned refrigerators, one of them could not use her refrigerator due to the fact that she did not have electricity. This explains the number of mothers (n=11, 22%) in figure 4.3 who used electricity to operate a refrigerator.

The mothers used the following sources of fuel for cooking: paraffin (n=36, 72%), electricity (n=17, 34%), gas (n=2, 4%) and firewood (n=2, 4%). It is important to take note that some mothers used more than one source of fuel for cooking, for

example, some (n=3, 6%) used both electricity and paraffin, others (n=2, 4%) used gas and paraffin while others (n=2, 4%) used paraffin and firewood. The two main sources of fuel that were used at the crèche were electricity, which was used more often and gas, which was used only in case of electricity failure.

4.2.4 Nutrition knowledge

In order to test the nutrition knowledge of the respondents (mothers and the two crèche caregivers), two sets of questions were used. The first set of questions had ten statements where respondents had to indicate agreement; and the second set consisted of ten multiple-choice questions with only one correct answer. The scores for the nutrition knowledge test of the mothers and the interpretation thereof are presented in Table 4.13.

TABLE 4.13: NUTRITION KNOWLEDGE TEST SCORES FOR MOTHERS

Statement scores	Interpretation	Frequency (n=50, 100%)
5	Average	1 (2%)
6	Good	1 (2 %)
7		7 (14 %)
8		8 (16%)
9		21 (42%)
10	Very good	12 (24%)
Multiple choice scores		
4	Fair	2 (4%)
5	Average	7 (14%)
6	Good	3 (6%)
7		20 (40%)
8		15 (30%)
9		3 (6%)

10 = Very good; 6 – 9 = Good; 5 = Average; 3 – 4 = Fair; 1 – 2 = Poor; 0 = Very poor.

None of the mothers managed to get all the ten multiple-choice questions correct as compared to few mothers (n=12, 24%) who got all the 'yes' or 'no' statements correct. Most (n=41, 82%) mothers scored better for the multiple choice questions than 74% mothers who scored better for the 'yes' or 'no' statements, both indicating good nutrition knowledge. The crèche caregivers scored higher on the statements as compared to the multiple-choice questions (see Figure 4.4). The mean score for the two nutrition knowledge tests were eight (8) and six (6) respectively.

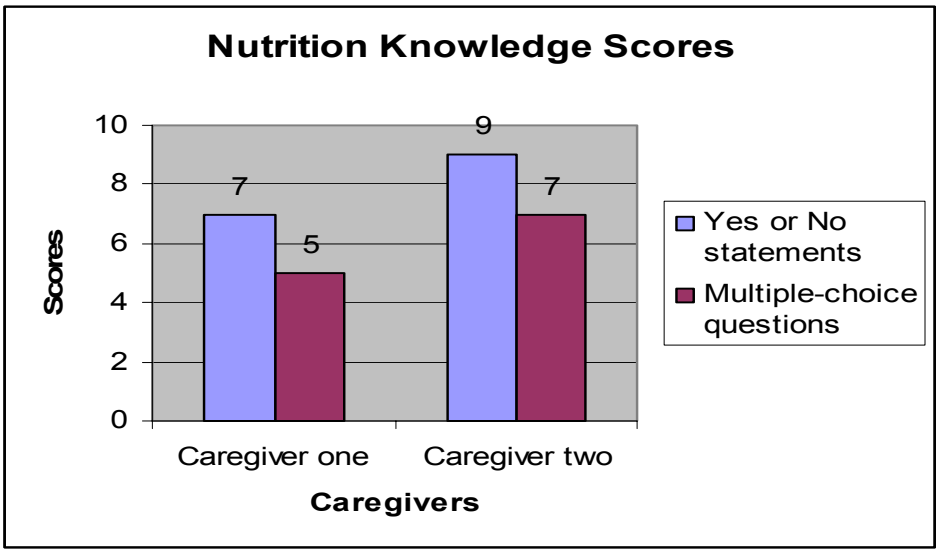


FIGURE 4.4: NUTRITION KNOWLEDGE SCORES OF THE CRÈCHE CAREGIVERS

Caregiver two, who has the highest educational level (standard 10), scored higher in both tests as compared to caregiver one, who has standard 8 as the highest educational level, but they both had a good nutrition knowledge.

The nutrition knowledge of mothers and the crèche caregivers was also tested using open-ended questions regarding components of a nutritious diet; appropriate food choices; food storage and food preparation methods.

4.2.4.1 Components of a nutritious diet

The mothers and crèche caregivers listed the types of food that were good for the child's optimal growth and development (see Table 4.14).

TABLE 4.14: TYPES OF FOOD GOOD FOR THE CHILD'S OPTIMAL GROWTH AND DEVELOPMENT

Food groups	Types of food listed by Mothers	Frequency (N= 50, 100%)*	Types of food listed by caregiver one	Types of food listed by caregiver two
Grains & grain Products	Maize porridge, samp, mealie rice, spaghetti, rice, bread, potato	50	Sorghum meal soft porridge & porridge, brown bread	Maize or sorghum meal porridge, samp, rice
Milk & Milk Products	Fresh milk, powdered milk, cheese, yoghurt	49	Milk	Powdered full cream milk
Meat & meat Substitutes	Red meat, chicken, eggs, fish, peanut butter, beans	48	Peanut butter, eggs	Sugar beans, tinned fish
Fruits	Banana, apple, orange, pear	43	Apple, banana, pear, orange	Apple, banana, orange
Vegetables	Pumpkin, butternut, cabbage, beetroot, carrot,	49		Carrot, potato, Cabbage

Food groups	Types of food listed by Mothers	Frequency (N= 50, 100%)*	Types of food listed by caregiver one	Types of food listed by caregiver two
	sweetpotato, gem squash			

TABLE 4.14 CONTINUED

Food groups	Types of food listed by Mothers	Frequency (N= 50, 100%)*	Types of food listed by caregiver one	Types of food listed by caregiver two
Fats & oils	Margarine, cooking oil	2		
Water		14	Water	
Rooibos tea		1		
Powder soup (e.g. royco, knorrox)		6		
Twiggles cheese snacks		1		

* respondents gave more than one type of food

All mothers (n=50, 100%) and the two crèche caregivers mentioned foods from the grain and grain products as good food for the optimal growth and development of the child. Fewer mothers and both crèche caregivers mentioned foods from the other three food groups and very few (n=2, 4%) mothers mentioned food from the fats and oils food group as good food for the child's optimal growth and development. Caregiver one (with the lowest educational level) did not mention vegetables as good food for the child's optimal growth and development.

The majority of the mothers (n=44, 88%) and the two crèche caregivers thought it was important that the child eats meat. The remaining mothers (n=6, 12%) did

not see the importance of giving the child meat and they opted to give the child the following food instead of meat: full cream powdered milk such as Nespray (n=5, 10%); fresh full cream milk (n=10, 20%); spinach (n=15, 30%); powder soup (n=15, 30%) and potatoes (n=5, 10%). The frequency of intake of these foods was also reported. All the caregivers however, confirmed the importance of milk and maize porridge consumption by the child, but the frequency of consumption differed between the mothers and crèche caregivers (Table 4.15). This difference is due to strongly held cultural believes regarding these food by the mothers and the crèche caregivers' exposure to information regarding the consumption of certain types of food.

TABLE 4.15: FREQUENCY OF MEAT, MILK AND PORRIDGE CONSUMPTION

How frequent per week	Meat consumption		Milk consumption		Maize porridge consumption	
	Frequency (N = 44)	Percentage (100%)	Frequency (N = 50)	Percentage (100%)	Frequency (N = 50)	Percentage (100%)
1	2	4.5%	1	2%	0	0
2	17	39%	2	4%	1	2%
3	24	54.5%	9	18%	1	2%
4	0	0	3	6%	0	0
5	0	0	4	8%	1	2%
6	0	0	1	2%	5	10%
7	1	2%	29	58%	6	12%
8	0	0	0	0	2	4%
10	0	0	1	2%	0	0
12	0	0	0	0	2	4%
14	0	0	0	0	32	64%

The most frequently consumed food in a week was maize porridge (64%) followed by milk (58%) and then meat (54.5%). Although most mothers (58%) recommended that a child should consume milk and maize porridge everyday as

these foods are culturally believed as healthy food good for the child's growth and development, the crèche caregivers preferred that milk and porridge be consumed twice a week to allow variety in the child's diet. Various reasons were put forward to explain meat; milk, and porridge consumption (see Table 4.16).

TABLE 4.16: REASONS FOR CONSUMING MEAT, MILK AND PORRIDGE

Reason	Mothers		Others
	Frequency	Percentage	
Meat:			
Valid reasons: To get important nutrients to help the child to grow healthy and stronger	13	28.26%	
Meat is good for the child's optimal growth and development	13	28.26%	
Meat has proteins which are good for the child's growth	3	6.52%	
Meat has vitamins & other nutrients for the child's growth	3	6.52%	
Chicken is healthier than red meat & supply important nutrients	0	0	Crèche caregivers
Invalid reasons: To add variety to the child's diet / to avoid eating the same relish everyday	6	13.04%	
Meat gives energy	4	8.69%	
Meat has proteins for strong bones and teeth	3	6.52%	
Minced meat is easy to digest	0	0	Crèche caregivers
Meat will make the child strong	1	2.17%	
Milk:			

Reason	Mothers		Others
	Frequency	Percentage	
Valid reasons: Milk is healthier for developing strong bones	18	30.51%	Caregiver two
Milk strengthens bones and teeth	9	15.25%	

TABLE 4.16 CONTINUED

Reason	Mothers		Others
	Frequency	Percentage	
Milk has calcium which helps to strengthen bones and teeth	4	6.78%	
Milk has proteins and calcium to help the child to grow healthy and stronger	2	3.39%	
Milk is good for the child's growth	2	3.39%	Caregiver one
Milk has vitamins for strengthening the bones	1	1.69%	
Milk fills the child's stomach and helps the child to grow healthy	9	15.25%	
Milk has vitamins required for the child's optimal growth	1	1.69%	
Milk supplies nutrients that build the body	1	1.69%	
Invalid reasons: Milk strengthens the child	4	6.78%	
Milk helps the child to grow bigger and stronger	3	5.08%	
Milk cleans the stomach	3	5.08%	Caregiver two
Milk gives energy	2	3.39%	
Porridge:			

Valid reasons: Porridge helps the child to grow well or healthy	11	17.74%	
Porridge is the staple food that provides energy	42	67.74%	Caregiver one
Porridge has carbohydrates to give strength	6	9.67%	
Porridge makes the child to be strong	5	8.06%	

TABLE 4.16 CONTINUED

Reason	**Mothers**		**Others**
	Frequency	**Percentage**	
Porridge fills the child's stomach	2	3.23%	
Porridge has carbohydrates to give strength	1	1.61%	
Invalid reasons: Porridge gives proteins to build bones	1	1.61%	
Porridge provides energy and proteins			Caregiver two

Most mothers and the two crèche caregivers gave valid reasons to explain the consumption of meat, milk and porridge as compared to few who gave invalid reasons.

All caregivers indicated that they gave the child snacks to eat (see Table 4.17).

TABLE 4.17: SNACKS GIVEN TO THE CHILD

Kind of snack	**Mothers**		**Other caregivers**
	Frequency	**Percentage**	
Twiggles cheese snacks (chips)	47	30.92%	
Fruits (banana, apple, orange, pear)	37	24.34%	Caregiver one & two
Shortbread biscuits	27	17.76%	

Kind of snack	Mothers		Other caregivers
	Frequency	Percentage	
Sweets (lollipop, toffees, smoothies)	18	11.84%	
Yoghurt (clover, danone)	13	8.55%	
Mayo drinking yoghurt	3	1.97%	
Concentrated fruit drinks (Oros or Sweeto)	4	2.63%	
Ready-to-drink fruit drinks (Bibo)	1	0.66%	

TABLE 4.17 CONTINUED

Kind of snack	Mothers		Other caregivers
	Frequency	Percentage	
Cornflakes	1	0.66%	
Fresh full cream milk	1	0.66%	
Brown bread with peanut butter	27	100%	Caregiver one
Apple juice	27	100%	Caregiver one

The consumption of unhealthy snacks was much higher (66%) than that of healthy snacks (34%) such as fresh fruits, yoghurt, cornflakes and fresh full cream milk. Among the unhealthy snacks, chips (twiggles cheese snacks) were the most popular kinds of snacks given to children. The children were given healthy types of snacks (fresh fruits, peanut butter sandwich and pure fruit juice) at the crèche rather than at home.

4.2.4.2 Appropriate food choices

Mothers could indicate which kinds of food items they would give their children for a healthy breakfast, lunch, dinner and snack, should they have a lot of money and access to any or all kinds of foods (see Table 4.18). The kinds of food items

mentioned are listed according to the five food groups, with an addition of the sixth food group to include the miscellaneous food items.

TABLE 4.18: HEALTHY KINDS OF FOODS FOR A CHILD

Food Group Kind of food	**Breakfast** **Frequency**	**Lunch** **Frequency**	**Dinner** **Frequency**	**Snack** **Frequency**
Milk & Milk Products				
Fresh full cream milk	35	1	3	1
Cheese, Melrose cheese spread	22	7	2	9
Feta cheese			1	
Yoghurt (clover, danone)		1		22
Custard (vanilla)			2	16
Ice cream				21
Meat & Meat Substitutes				
Eggs	20	4	2	
Polony	7	7		1
Peanut butter	1			
Viennas	1			
Chicken		22	27	
Beans (baked/ sugar beans)		18	10	

Food Group Kind of food	Breakfast Frequency	Lunch Frequency	Dinner Frequency	Snack Frequency
Beef (cuts or mince)		12	16	
Tinned fish		1		
Corned beef		1		
Fish, frozen			3	
Bacon			1	
Peanuts				1
Fruits & Vegetables				
Vitamin A-rich (pineapple, cabbage, spinach, carrot, pumpkin, butternut, yellow pepper, green beans)		50	50	

TABLE 4.18 CONTINUED

Food Group Kind of food	Breakfast Frequency	Lunch Frequency	Dinner Frequency	Snack Frequency
Fruits & Vegetables				
Vitamin C-rich (orange, strawberry, potato, tomatoes, green pepper, cabbage)	2	32	32	9
Other (banana, apple, pear, beetroot, onion, lettuce, cucumber, olives)	8	40	27	38
Canned vegetables		2		
Canned fruits in syrup				4
Fruit juices	21	15	5	4
Frozen vegetables			3	
French fried potato chips	1	3	3	

Food Group Kind of food	Breakfast Frequency	Lunch Frequency	Dinner Frequency	Snack Frequency
Grain & Grain Products				
Breakfast cereals including Kellogg's corn flakes, Jungle oats, Weetbix, Morvite cereal (enriched, maltabella porridge)	31			1
Brown Bread	19	10	3	10
White bread/ bread rolls	9	2	1	
Stiff maize meal porridge	1	14	28	
Pasta (noodles, spaghetti)	1	2	1	2
Rice		21	14	
Samp		1		
Cake		1		20
Dumpling			1	

TABLE 4.18 CONTINUED

Food Group Kind of food	Breakfast Frequency	Lunch Frequency	Dinner Frequency	Snack Frequency
Fats & Oils				
Margarine (Rama)	14	3		
Non-dairy creamer (Cremora)	1			
Mayonnaise		20	12	
Cooking oil (Sunflower)		12	9	
Salad dressing, Greek (knorrox)			1	
Chocolate bar				6
Miscellaneous Miscellaneous				
Rooibos tea	4			

Sugar	3			
Salt (fine)		10	9	
Soup powder (Royco or Knorrox)		6	10	
Beef stock cubes		4	5	
Rajah curry (mild)		3	1	
Mustard sauce		1		
Jelly			2	1
Twiggles cheese snacks				9

Foods from all the six food groups would be given to a child for a healthy breakfast, lunch and dinner with some foods dominating at certain mealtimes than others. For example, foods from the milk and milk products, grain and grain products and fruits and vegetables groups (preferably fruits) would mostly be given for a healthy breakfast. For a healthy lunch and dinner foods from the meat and meat products, fruits and vegetables (most preferably vitamin A-rich vegetables) and grains and grain products food groups would be mostly preferred as compared to foods from the remaining food groups. Foods that would be given to a child for a healthy snack were mostly from the milk and milk products, grain and grain products and fruits and vegetables food groups. The crèche caregivers would give a child fresh fruits such as banana, apple, orange and pear as healthy snacks. Although foods from the different food groups were mentioned, not all the foods were healthy food choices (e.g. ice cream, feta cheese, bacon, polony, viennas, non-dairy creamer, twiggles cheese snacks, chocolate bar etc.).

4.2.4.3 Food storage

All the mothers stored their food in the kitchen. Food items such as maize meal were kept in a sealed container or a bin. Most mothers (n=45, 90% and n=46, 92%) stored bread in a bread container and vegetables on a vegetable rack or in

a bowl which was then placed on top of a kitchen cupboard. Cooked foods were stored in pots or in airtight containers. Few mothers (n=11, 22%) who had refrigerators could refrigerate left-over cooked food. The crèche caregivers stored the food in a storeroom, specifically for storing food, e.g. maize meal in a big airtight container and non-perishable vegetables and other food items were stored as is.

The mothers (n=11, 22%) who had and used refrigerators in their households stored certain types of foods in refrigerators (see Table 4.19).

TABLE 4.19: FOOD STORED IN A REFRIGERATOR

Types of food	Frequency
Dairy (e.g. fresh milk, yoghurt, cheese)	11
Meat (chicken, sausage, beef)	11
Vegetables (tomato, carrot, cabbage)	11
Fruit (apple, pear)	11
Beverages (fruit juice)	5

Perishable food items such as dairy products, meat, fruit and vegetables were mostly refrigerated both at home and at the crèche. The crèche caregivers used full cream powdered milk which does not require refrigeration (if not diluted with water).

4.2.4.4 Food preparation methods

The food preparation methods that were used to prepare food for the child aged 3 to 5 years were: boiling, steaming and frying (see Table 4.20).

TABLE 4.20: FOOD PREPARATION METHODS USED

Food preparation method	Frequency (N=50)*	Percentage (N=100%)

Boiling (using little water)	30	42.25%
Steaming	12	16.90%
Frying in oil	29	40.85%

*respondents used more than one method

Most of the mothers and the two crèche caregivers used boiling (in little water) and frying (in oil) as food preparation methods to prepare food for the preschooler. Foods such as rice, macaroni, potatoes, pumpkin, carrots and spinach were boiled by adding little water to the food and boil it until cooked whereas onion, cabbage, meat (chicken, beef, sausages) were fried by coating a frying pan or pot with oil, add the food and then fry the food. The reason for frying in oil was to improve the taste of food. Few mothers would steam foods such as rice and macaroni.

In order to enhance the flavour of food, certain condiments were added to the food while the food is being cooked (see Table 4.21).

TABLE 4.21: FOOD ITEMS ADDED TO FOOD DURING COOKING

Condiments	Frequency
Cooking oil	49
Salt	50
Spices (mild)	40
Herbs	1

Amongst the condiments added, salt and cooking oil were highly used (by both mothers and crèche caregivers) whereas herbs were seldom added to food.

4.2.5 Food intake pattern

The 24 hour recall form, which asks each participant to mention everything he/she ate and drank the previous day, was used to find out about all the food

and drinks the child ate and drank in the previous day. In this case the mothers and the two crèche caregivers were asked to mention everything the child ate and drank from the time he/she woke up till the time he/she went to sleep. The food that the child ate in the previous day was typical of his/her habitual food intake. The children had five meal times while they were at home (see Figure 4.5).

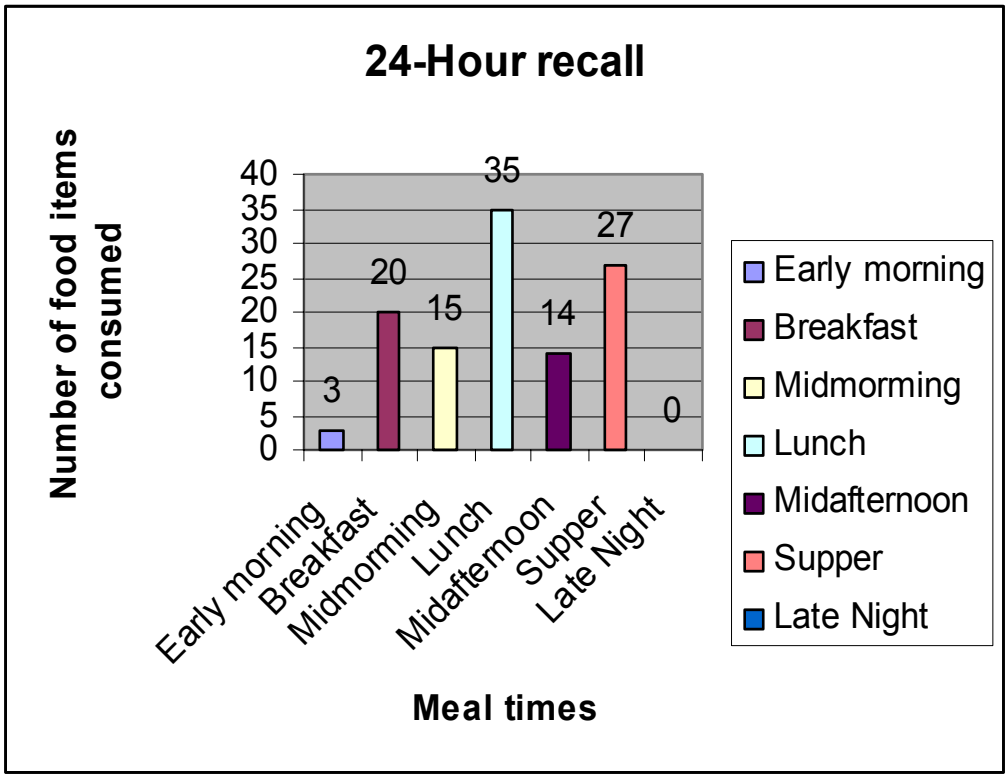


FIGURE 4.5: TOTAL NUMBER OF FOOD ITEMS PER MEAL INTERVAL

Most food items were consumed during lunch (35), supper (27) and breakfast (20). Several food items were consumed as snacks (mid-morning and mid-afternoon). No food was eaten for the late night meal. The children had four mealtimes at the crèche starting with breakfast and ending with the mid-afternoon snack because the crèche operated until 17:30 and did not cater for the early morning meal and supper, which was consumed at home (see Table 4.22).

TABLE 4.22: FOODS CONSUMED AT THE CRECHE

Mealtimes	**Food groups**				
	Milk & Milk Products:	**Meat & meat substitutes:**	**Grains & grain products**	**Fruit & Vegetables**	**Other**
Breakfast:					
	- Full cream powdered milk (Numel)		- Sorghum meal soft porridge		- Sugar - Water
Mid-morning:					
Caregiver 1		- Peanut butter	- Brown bread	- Fruit juice - Apple	
Caregiver 2	- Yoghurt (Clover danone)			- Orange	
Lunch:					
Caregiver 1			- Spaghetti	- Pumpkin	- Soup (Soya mince)
Caregiver 2		- Tinned fish	- Samp	- Potatoes	- Soup (Soya mince) - Water
Mid-afternoon:					
Caregiver 1		- Peanut butter	- Brown bread	- Fruit juice	
Caregiver 2	- Full cream powdered milk (Numel)	- Peanut butter	- Brown bread		

* these foods were consumed on two different days

Breakfast was the first meal that the children received at the crèche and this meant that no food was given prior to breakfast at the crèche. The foods that were consumed for breakfast were the same for all children being cared for by the two different caregivers. However, the two caregivers provided different types of food for the mid-morning meal and lunch, as well as the different types of drinks for the mid-afternoon meal. The main differences were that children under caregiver one's care consumed foods from three food groups for the mid-morning meal as compared to children from caregiver two who consumed foods from two food groups for the same meal time. The different types of foods consumed for lunch were from three similar food groups, but caregiver two's children had an additional food from the meat and meat substitute food group. Since the crèche operated only on weekdays, the caregivers indicated that they did not know whether the children's eating patterns on weekends were different or not.

At home, the majority (n=48, 96%) of the children had five meal times and very few (n=2, 4%) children had six meal times with some food being consumed more frequently than others (see Table 4.23).

TABLE 4.23: FOODS CONSUMED AT HOME

Food groups & types of food	**Frequency of consumption per meal interval**					
	Early morning	**Breakfast**	**Mid-morning**	**Lunch**	**Mid-afternoon**	**Supper**
Milk & Milk Products:						
Fresh, full cream milk		11*		8*		5
Nespray		4		3		
Yoghurt (Clover danone)			2		6	
Inkomazi (full cream sour milk)				8*		6
Mayo drinking yoghurt					1	
Meat & Meat Substitutes:						
Peanut butter		15*	1		1	

Food groups & types of food	Frequency of consumption per meal interval					
	Early morning	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Chicken feet		1				1
Eggs		1		1		
Chicken				5		12*
Beef				5		5
Tinned fish				2		3

TABLE 4.23 CONTINUED

Food groups & types of food	Frequency of consumption per meal interval					
	Early morning	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Polony				1		
Baked beans (tinned)				1		
Chicken gizzards						4
Sausage						1
Chicken livers						1
Grains & Grain Products:						
Sorghum meal soft porridge	1	9				
Brown bread		33*	8	4	3	1
Jungle oats		4				
Kellogg's corn flakes		3				
Biscuits, short bread			12		12	
Maize porridge		1		43*		46*
Morvite		1				
White bread		1				
Rice				3		3
Macaroni				1		
Fruit & Vegetables:						
Banana			13*		16*	

Food groups & types of food	Frequency of consumption per meal interval					
	Early morning	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Apple			6	1	10	1
Strawberry					1	
Cabbage				8*		11*
Onion				6		10
Tomato				6		6
Spinach				6		5
Pumpkin				1		1
Beetroot				1		1
Green pepper				1		1
Potatoes						4

TABLE 4.23 CONTINUED

Food groups & types of food	Frequency of consumption per meal interval					
	Early morning	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Fats and Oils:						
Rama margarine		10	2	2	1	
Non-dairy creamer (Cremora)		10*	1	1		
Rondo margarine		2				
Sunflower cooking oil				20*		24*
Miscellaneous & others:						
Water		4	38*	18*	27*	8
Salt, fine		1		23*		34*
Rajah curry, mild		1		11*		19*
Twiggles cheese snacks (chips)			31*		31*	
Sweets (lollipop, toffees)			5		11	
Five roses tea			1			

Food groups & types of food	Frequency of consumption per meal interval					
	Early morning	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Oros (concentrated drink)			2	1	3	
Sweeto (concentrated drink)				2	2	
Soup powder (Royco or Knorrox)				3		7
Beef stock cubes				1		
Tomato sauce				1		
Aromat				1		1
Sugar	2	42*	4	1		
Rooibos tea	1	34*	3	1		

* Most commonly consumed foods in each meal category

Hardly any children (n=2, 4%) consumed anything for the early morning meal. For breakfast fresh full cream milk (calcium-rich food), peanut butter (protein-rich food) and brown bread (starchy food), Rooibos tea, sugar and non-dairy creamer were used most often. The same breakfast foods consumed at the crèche were also consumed at home. The mid-morning and mid-afternoon meals mostly used biscuits (short bread), twiggles cheese snacks (chips), banana (fruit) and water. Starchy food such as maize porridge, vegetables such as cabbage and condiments such as sunflower cooking oil, salt and curry powder were mostly used for lunch and supper meals. These condiments were mostly added when cooking foods like cabbage, spinach, onion, potatoes, beef, chicken, fish and eggs, to give them flavour. Dairy products such as fresh full cream and sour milk were mostly used as calcium-rich foods for lunch (consumed together with maize porridge), whereas chicken as a protein-rich food was mostly consumed for the supper meal.

4.2.6 Association of care practices and nutrition knowledge

The strong linkage between resources for care, nutrition knowledge and caring activities (as reported in Chapter 2 of this script) cannot be ignored. The relationship between nutrition knowledge and certain aspects of care such as the mother's educational level; the mothers' employment status; control of household income; the use of electrical household appliances; food preparation methods used and storage of certain food items such as maize meal; bread, vegetables and cooked foods were investigated. This was done to find out whether nutrition knowledge and these aspects of care influenced each other (see Table 4.24).

TABLE 4.24: RELATIONSHIP BETWEEN ASPECTS OF CARE AND NUTRITION KNOWLEDGE OF MOTHERS

Variable name	**Nutrition knowledge score: 10 – 14 N=16 (%)**	**Nutrition knowledge score: 15 – 19 N=34 (%)**	**Probability (P) value Fisher's Exact Test**
Educational level:			
<Standard 8	50.00	29.41	0.2106
Standard 9+	50.00	70.59	
Employment status:			
Working	62.50	47.06	0.3723
Not working	37.50	52.94	
Control of household income:			
Mother	56.25	85.29	Numbers too

Variable name	Nutrition knowledge score: 10 – 14 N=16 (%)	Nutrition knowledge score: 15 – 19 N=34 (%)	Probability (P) value Fisher's Exact Test
Father	18.75	2.94	small
Grandparent	12.50	0.00	
Other (both mother & father)	12.50	11.76	
Use of household electrical appliances:			
Yes	37.50	32.35	0.7568
No	62.50	67.65	
Food preparation methods:			
Boiling (in little water)	56.52	35.42	0.0820*
Steaming	4.35	22.92	
Frying (in oil)	39.13	41.67	
Food storage:			
Maize meal – Bucket / bin	100.00	100.00	
Bread – Container	12.50	0.00	
- Bread bin	75.00	88.24	
- Kitchen cupboard	12.50	11.76	
Vegetables – Kitchen cupboard	0.00	2.94	
- Vegetable rack	75.00	88.24	
- Refrigerator	12.50	5.88	
- Bowl	12.50	2.94	

TABLE 4.24 CONTINUED

Variable name	Nutrition knowledge score: 10 – 14 N=16 (%)	Nutrition knowledge score: 15 – 19 N=34 (%)	Probability (P) value Fisher's Exact Test
Cooked foods – Container	6.25	6.06	Numbers too small
- Refrigerated In containers	31.25	15.15	
- Pots	56.25	57.58	
- Airtight containers	6.25	15.15	

*Significant on the 10% level

The data shows that there were no statistical significant differences between the two nutrition knowledge score groups with regard to the various aspects of care. For example, the mother's level of education did not make a significant difference on her nutrition knowledge. The only statistical significant difference (on the 10% level) was that more (22.92%) mothers with a higher nutrition knowledge score used steaming as a good food preparation method as compared to very few (4.35%) mothers who used steaming.

4.3 DISCUSSION OF RESULTS

The aim of this study was to investigate the caring capacity of caregivers of pre-school-age children (aged three to five years). A questionnaire based on all the aspects of care was used to collect data including biographic information of the caregivers; child information; resources for care and nutrition knowledge of caregivers. The data were analysed by a statistician from the University of Pretoria using appropriate statistical methods such as descriptive statistics, using the SAS computer program. Correlations were done on some variables. This section presents a discussion of the results in terms of the sub-sections and objectives of the study.

4.3.7 Biographic information

Many research studies conducted by various researchers in the field of child nutrition emphasized the important role played by women as primary caregivers of children. Researchers such as Kerr *et* al (2007:91); Kulwa *et al* (2006:242); Macharia *et al* (2005:404); Kruger and Gericke (2002:218; 2001:61); Faber and Benadé (2002:2); Bouis and Hunt (1999:168); Ruel *et al* (1999:1); Krige and Senekal (1997:20); Dannhauser *et* al (1996:15) and many others emphasized the role of women in caring for children. Similarly, in this study, all the caregivers of

children were women of various age groups (between 22 and 40 years). In this study the majority of mothers were unmarried and living with a partner. Krige and Senekal's 1997 study of the preschool children of farm workers in the Stellenbosch district, revealed that the mothers' marital status influenced the child's nutritional status in the sense that undernourished children belonged to mothers who were unmarried and living with a man, whereas well-nourished children belonged to mothers who were married and living with the husband. For the purpose of this study, the influence of the mothers' marital status on the type of care the child received was not investigated.

However, all the caregivers in this study had access to formal schooling, with the majority of mothers and the two crèche caregivers having obtained educational levels from standard six to beyond standard ten as their highest educational levels. This could be closely linked with the fact that they were still young and therefore more likely to have acquired secondary school education and higher. Several studies revealed that the mothers' educational level (formal schooling) had a significant effect on children's nutritional status and therefore associated higher education with a better nutritional status (Kerr *et al,* 2007:93; Macharia *et al,* 2005:7; Krige & Senekal, 1997:20; Dannhauser *et* al, 1996:21). However, Ruel *et al* (1999:19) and Engle *et al* (2000:31) found that mothers with low levels of schooling were able to perform good care practices. This means that performing good care practices would not necessarily depend on the mother's educational level. Kumar-Range, Naved & Bhattarai's 1997 study conducted in rural Bangladesh revealed that a mother's access to information on nutrition and child care, primarily through radio programs, clearly raised the level of her children's nutritional status and this factor was far more important than her level of formal education. The importance of informal education regarding good child care practices should be emphasized in this community so as to raise the level of awareness and to promote good care practices among the caregivers which would ultimately contribute positively to the well-being of children.

The educational level of the mothers may determine the types of job one would hold as well as the level of income earned as is the case in this study. Macharia *et al* (2004:406) reported that low educational levels may have accounted for the high ranking of casual labour (which pays less money) as a source of income compared to salaried income in their study conducted in Kenya. Most mothers in this study attended school up to standard 10, but were doing informal jobs (mostly domestic work at other people's homes), which are more likely to pay them less money to be able to take care of their households. Most children in the study were the youngest and this meant that most households had several children to feed. This explains the high percentage of mothers who relied on government's social security grants to aid in providing needs for child care. However, having attended formal schooling, being employed and unmarried gave most mothers the autonomy and control of the income to make decisions regarding childcare, which is a positive thing for proper child growth and development. This is similar to what Engle *et al* (1997:21) reported regarding the fact that in female-headed households where women generally enjoy greater autonomy and control of resources, children were cared for much better than expected even if incomes were lower because women would allocate larger amounts of resources such as money and food to children. Kassier, Maunder and Senekal (2003:30) also confirmed that a child's nutritional status is often better in female-headed households where mothers are more likely to have a say in income expenditure more especially for childcare.

The mothers in this community, both employed and unemployed, needed the crèche for various reasons such as educational, development, care and safety. The actual care practices as perceived by caregivers in this community involved more than just the provision of food (i.e. preparing food and feeding the child) for the child, but also included activities such as bathing the child, dressing the child, playing with the child, healing the child (preparing and giving the child *motswako* and taking the child to a clinic or doctor), cleaning the environment in which the child plays and stays, and finally performing educational activities with the child.

These caring activities compare very well with what Kulwa *et al* (2006:240) and Van Esterik (1995:2 of 9) listed as caring activities, namely: preparing meals, feeding the child, dressing the child, healing (taking the child to a clinic or doctor), body cleaning, comforting, playing with the child, and generally nurturing others. In addition to feeding, Kruger and Gericke (2002:219) also reported that mothers would prepare and give the child *motswako*, which is a home-made oral replacement therapy to treat diarrhea and this is in agreement with what caregivers did in this study, as part of their caring activities. According to Coutsoudis, Maunder, Ross, Ntuli, Taylor, Marcus, Dladla and Coovadia (2000:23)'s study of food security and caring patterns of vulnerable young children in South Africa, food, which is integral to care-giving was not used by women as a way of showing and giving care due to limited food choices, but was used to teach children about other things such as status in the family and community. Studies conducted by Macharia *et al,* (2005:6); Kruger and Gericke (2002:222; 2001:69) emphasized proper feeding practices or dietary intake as important determinants of childcare, which was also the case for this study.

4.3.8 Resources for care

Care ultimately depends on the availability, accessibility, and use of resources (Kulwa *et al,* 2006:237; Engle *et al*, 2000:27; Engle *et al*, 1997:3; Jonsson, 1995:2 of 7). A study conducted by Kassier *et al* (2003:24) also emphasized the availability of resources such as time, money, infant care support, access to safe, clean drinking water and access to health care facilities as important resources that influence infant feeding practices. According to Macharia *et al* (2005:3) community-based activities aimed at changing care practices and improving the nutritional status of children requires substantial resources in the form of time and funds. This corresponds with what Coutsoudis *et al* (2000:23) reported that improved care-giving practices would have little impact on nutritional status, unless accompanied by an increase in the amount and variety of resources available to the family. This explains why most mothers worked to earn income

so that they could provide for their children (e.g. pay alternative caregivers, buy food for the child etc.).

In this study most mothers were working outside the home, but they were doing informal jobs which would probably not pay very well and they did not receive any money from the children's fathers. The fact that there were more families with several children presents another problem as this means more mouths to be fed with the limited income. This explains why most mothers used government or social security grants to supplement their income to assist in childcare. Despite the limited income mothers earned, they still managed to pay for the crèche (alternative caregivers) and provided the child with basic needs they could afford. This clearly indicates that if these mothers could get well-paying jobs and have access to resources such as electricity, they could provide more for the child. For example, they could buy labour-saving electrical appliances such as stoves; washing machines; microwave ovens that will help simplify their household chores and refrigerators to be able to store perishable foods like dairy products for the child. In this study, both employed and unemployed mothers left their children in the care of alternative caregivers (i.e. crèche caregivers) who were left to perform important care behaviours (e.g. preparing and cooking the children's food, feeding or supervision during meals) when they were working or out looking for a job to be able to take proper care of the child (work to earn income to be able to buy food and clothes for the child and pay the crèche). Bouis and Hunt (1999:169) and Engle *et al* (1997:37) state that when women control household resources including income, a higher proportion of that income is spent on food and other inputs that improve nutrition and health and that they direct more resources to children than when men are in control. In this study, most mothers controlled the household's economic resource (income) allocated for childcare (because most were unmarried and working), which, if used properly and coupled with proper nutrition knowledge, would contribute positively towards good childcare practices. Of most importance is to make the mothers aware of the fact that they should spend their money effectively (irrespective of the

amount), for example, buying nutritious foods and other things that will contribute to the child's optimal growth and development.

According to Kulwa *et al* (2006:242) the benefits of having an alternative caregiver may be outweighed by the quality of childcare he or she can provide, considering that most caregivers do not have experience and their level of education is low. Given the caregivers' (including the mothers) workload, there is not sufficient time to do everything and get enough rest, and of most importance, is to take proper care of oneself to be able to take proper care of the child. According to Engle *et al* (1997:3) the provision of resources such as time (and education as well as social support) by family or society can be considered to form part of care for the caregiver, which may contribute significantly to children's nutritional status. Bouis and Hunt (1999:169) state that in order for women to take their responsibilities towards childcare effectively, they need to maintain their own nutrition status. Therefore, time demands on women affect the amount and type of care given. In this study most mothers were working outside the home and had other responsibilities in addition to caring for the pre-school-age child; the crèche caregivers worked for a maximum of 11 hours per day, taking care of a large number of children (18 and 27) and doing other tasks. Therefore, this may compromise the quality (amount and type) of care given to each child. For example, if one child dirtied himself/herself during meal times or needed help during meals (e.g. to be fed), the crèche caregiver had to clean up or to attend to that individual child so that she could help him/her. This would be more difficult if several children needed attention at the same time as the caregiver could only attend to one child at a time.

Sayed (2002:7) state that care is facilitated when, for example, women have access to labour-saving devices. In this study, the majority (n=33; 66%) of mothers did not have electricity and household electrical appliances, but used other sources of fuel such as gas, paraffin and firewood for cooking. Few mothers (n=17; 34%) and the two crèche caregivers had electricity and used it

mainly for cooking, lighting the house and ironing clothes. This contradicts with the results of Faber, Jogessar and Benade (2001:404) in KwaZulu-Natal (Ndunakazi) where large numbers of households had electricity but preferred wood as an energy source for food preparation. The difference might be the fact that this study was conducted in a peri-urban informal settlement with limited resources and the mothers were still very young and more likely to adapt quicker to changing circumstances than older women in a rural area as is the case with women in Ndunakazi. If these mothers had access to electricity, they used it for cooking, boiling water and refrigeration, as was clear from the total use of electricity by 34% mothers in Olievenhoutbosch. It is evident that if all women can have access to electricity, they would move away from using other sources of fuel and therefore use electricity and household electrical appliances to simplify their lives. The women also had labour-saving devices such as two-plate electrical stoves, kettles, refrigerators, irons, microwave ovens and washing machines to simplify their household chores and would therefore enable them to perform their child caring activities with greater ease when they were at home.

Although 34% of mothers had electricity, only 22% had a refrigerator. The refrigerators (at the crèche as well as at home) stored perishable food items and beverages which must be chilled. According to Krige and Senekal (1997:22) access to cooling facilities such as a refrigerator or deep freezer is positively associated with good nutritional status because most of the well nourished children in their study came from households with cooling facilities as compared to few under-nourished children from households with such cooling facilities. In this study, only a few children could benefit from the positive effects of having a refrigerator in the household including the availability of certain types of foods (e.g. meat, dairy products such as yoghurt, cheese, fresh milk etc.) that require refrigeration. Only those with refrigerators could buy and give these types of food to the children. The storage facilities that the mothers and the crèche caregivers used for storing other foods such as maize meal, bread and non-perishable vegetables were considered to be proper storage methods. The question

remains on the storage of cooked foods as prolonged storage of cooked foods (beyond 24 hours) has negative effects on the nutritional status of the child. A study conducted by Abate, Kogi-Makau and Muroki (2001:6 of 10) in urban slums of Ethiopia revealed that poor personal and household hygiene practices (e.g. prolonged storage of cooked foods, i.e. beyond 24 hours coupled with feeding the child with unwashed hands, storage of food and water in uncovered receptacles, child waste inside the house) were associated with high prevalence of infections which in turn were associated with nutritional insecurity. The biggest problem identified in this community was the lack of access (76%) to cooling facilities (e.g. a refrigerator) for storage of perishable foods. Faber *et al* (2001:408) state that a lack of cold storage facilities can have a major influence on the consumption of dairy products. Therefore, the lack of cooling facilities by most mothers in this study would limit the consumption of perishable food to small quantities that can be consumed in one day (see table 4.24 for the limited consumption of milk and milk products). Buying smaller quantities of certain food items is also more expensive, resulting in limited access to these kinds of foods for the child specifically, as the working adult would be given first choice of the expensive food items.

4.3.9 Nutrition knowledge

Having proper nutrition knowledge and the application thereof is crucial for improving the nutritional status of children and if coupled with the availability, access and use of resources for care, would contribute significantly to the growth and development of children. Research conducted by Kruger and Gericke (2002222; 2001:69), Coutsoudis *et al* (2000:23) and Bouis and Hunt (1999:199) also emphasized that proper nutrition knowledge is required, irrespective of the mothers' educational level, to improve the level of care-giving and consequently

the nutritional status of children. Therefore, higher educational levels of the caregivers in this study would not necessarily translate to good care practices on the child and lower educational levels of caregivers would not necessarily mean that they would not perform good care practices towards the child. For example, most mothers and the two crèche caregivers mentioned foods from the four food groups as good for the child's optimal growth and development, eliminating foods from the fats and oils group. The caregiver with highest educational level also believed that giving a child apple would help to strengthen his/her teeth. This makes it clear that good care practices are not necessarily dependent on the educational level of the caregivers, but on whether the caregivers received proper education towards childcare, for example, the right kind of information with regard to healthy food choices.

The caregivers in this study scored higher in the two sets of nutrition knowledge test used, and therefore indicated good nutrition knowledge, but this would not necessarily mean that they had good nutrition knowledge in general and that they applied the knowledge in caring for the pre-school-aged child. For example, most caregivers agreed that the child should consume milk to have strong bones, but when they had to choose a food that the child should eat to strengthen bones and teeth, they chose apple over milk. The same happens to protein-rich foods whereby several mothers chose foods such as orange and maize meal as the best sources of protein over eggs. This clearly indicates lack of knowledge with regard to specific foods and their functions as was found by Kruger and Gericke (2002:222). Although the caregivers did not have knowledge of certain foods and their functions, almost all of them knew that carrot is an essential food to maintain healthy eyes and good vision. Therefore the caregivers in this community knew the basic broad nutrition concepts, but did not have detailed knowledge to enable them to improve the nutritional status of the children and to improve the diversity of their diets.

Although this study did not use a validated nutrition knowledge test due to the literacy level of community members, there was not such a big difference on the mothers' educational level to really differentiate between general nutrition knowledge. The test given was really not that tough and could not differentiate good nutrition knowledge from general. It is important to note that caregiver two with the highest educational level (standard 10) scored higher (7 and 9) than caregiver one (5 and 7) who had standard 8 as the highest educational level in both nutrition knowledge tests used in this study. Therefore, there seems to be a trend that the higher the educational level (formal education) the better the nutrition knowledge. However, this could not be verified due to the fact that this was a comparison only between two individuals and are therefore not generalizable, which is apparent as this contradicts with other researchers' findings regarding formal education and the level of nutrition knowledge. It is however in agreement with what Peltzer (2002:7) found in his study of investigating the relationship between nutrition knowledge and dietary behaviour and assessing the perceived influences on food selection among black students in South Africa. The findings revealed that university students had significantly more nutrition knowledge than secondary school students on all the four nutrition knowledge subscales he used. He therefore came to a conclusion that nutrition knowledge may increase with higher educational levels (Peltzer, 2002:7). The question of whether the level of formal education increases one's nutrition knowledge remains arguable as it is the case with the two crèche caregivers in this study, but there was no difference between the mothers' educational level and nutrition knowledge. However, it should be kept in mind that Pelzer used a validated questionnaire which asked different questions as compared to the ones used in this study.

Most caregivers in this study had knowledge of the types of foods that are good for the child's optimal growth and development because most of them mentioned foods from four of the five food groups (grains & grain products, milk & milk products, meat & meat substitutes and fruits and vegetables) - fats and oils were

not always mentioned (see the types of foods in Table 4.15). Most mothers indicated that foods from the grain and grain products (more especially porridge) were the most important in a meal and if combined with either foods from the remaining three food groups they complete a meal which will enable the child to grow and develop optimally (for example, porridge with milk or tinned fish or cabbage). All caregivers learned that porridge and milk are important foods for the child's growth and development from their mothers and grandmothers as part of socialization. When rice was consumed, other types of foods from the three or four food groups were combined in one meal, which added more variety. This is similar to what Kruger and Gericke (2001:67) found in their Hammanskraal study whereby cereals (mostly soft porridge) were commonly added to a baby's diet and some mothers of older children sometimes added milk or a thin watery gravy in which meat has boiled to give to the child. Researchers such as Kamudoni, Maleta, Shi and Holmboe-Ottesen (2007:328) and MacIntyre, De Villiers and Baloyi (2005:73) also confirmed the use of maize meal porridges (i.e. maize-flour based porridges and thin maize meal porridge respectively) for infant feeding as the first complementary food for physiological reasons (to satisfy the needs of a hungry baby). In this study, porridge was the most frequently consumed food given to a child mainly for health reasons and physiological reasons ("it fills the child's stomach"). These reasons are more or less the same as those found by Kruger and Gericke (2001:67). As Kruger and Gericke (2001:67) found some misconceptions (such as "soft porridge builds the body", "it keeps the bones strong") regarding the reasons for the consumption of porridge by children (0 – 36 months), the following misconceptions were found in this study:

- "porridge gives proteins to build bones" and
- "porridge provides proteins".

Most caregivers regarded milk consumption by a child as important, but the actual intake was not known. Several mothers (29) believed that a child should consume milk everyday whereas the crèche caregivers mentioned twice a week, which is inadequate for the growing child who needs to strengthen bones and

teeth. Although milk is considered important, there were few misconceptions such as:

- "milk gives energy" and
- "milk cleans the stomach".

Kruger and Gericke (2002:221) also found that milk consumption was considered important, but reported a similar misconception regarding milk consumption, namely "milk gives the baby energy". It is surprising to see that several mothers and caregiver two indicated that milk cleans the stomach and therefore should be consumed by the child. These misconceptions prove the fact that although the mothers knew something about nutrition (e.g. that it is important to consume certain foods), they lacked detailed knowledge regarding functions of certain foods and how they could include certain types of foods in the child's diet to improve the nutritional status.

Although most mothers would allow the child to consume meat, the intake was very low since most mothers would give meat thrice a week. The reason for the low intake of meat is related to strong cultural beliefs as those found by Kruger and Gericke (2002:221) whereby meat was considered unsuitable for children as it would cause worms. The other important reason that explained the infrequent or low consumption of meat was that meat is expensive and therefore, cheaper types of meat such as chicken and minced beef were more preferred than the most expensive types (e.g. beef, mutton, pork). The caregivers were uninformed about the reasons for meat consumption as the following misconceptions existed:

- "meat gives energy";
- "meat has proteins for strong bones and teeth"; and
- "meat will make the child strong"
- "minced meat is easy to digest".

A few mothers indicated that they would give the child alternative foods such as soup (commercial soup powder), spinach, full cream milk and potatoes instead of meat because these foods were more affordable than meat. Replacing meat with

commercial soups as a meat substitute has also been reported by Kruger and Gericke (2002:221), but the problem was that a soup would only be a flavouring agent rather than a protein. Although the caregivers had knowledge of certain foods good for the child's growth and development, it was clear that they could not really defend their food choices with regard to nutrition. Therefore, the mothers did not have knowledge regarding good meat alternatives or substitutes that would provide the amount and quality of proteins as would be found in meat except for full cream milk which has proteins.

Several caregivers (14 mothers and one crèche caregiver) mentioned that water was also good for the child's optimal growth and development. Water is also an important fluid required by the human body, therefore, adequate amounts of water must be taken daily for the child's optimal growth and development. These caregivers indicated that water was needed to quench the child's thirst, which was the same reason given in studies by Kruger and Gericke (2001:67) and MacIntyre *et al* (2005:72). Furthermore they also believed that water had to be consumed after every meal to aid digestion and to help pass the food through the digestive system. This scientifically sound reason (to quench thirst) and misconceptions (to aid digestion and to pass the food) is in agreement with Kruger and Gericke (2001:67)'s findings in their Hammanskraal study. MacIntyre *et al* (2005:72) also reported misconceptions such as water must be consumed to prevent constipation, to loosen the stools, to relieve stomach cramps as reasons for giving infants water. Kamudoni *et al* (2007:331) also reported the importance of common cultural values surrounding infant feeding (i.e. giving herbal water for cleansing the child's stomach within 2 weeks of birth) which were still held and practiced by mothers in some parts of Malawi. These reasons proved that cultural beliefs are still adhered to and they are a very strong driver for caring practices. Cultural practices determine who eats what and when (Wenhold, Faber, van Averbeke, Oelofse, van Jaarsveld, Jansen van Rensburg, van Heerden and Slabbert, 2007:330) and to a certain extend the reasons

thereof which would determine the actual dietary intake of the individual and therefore the individual's nutritional status.

Non-nutritious foods (e.g. powdered soup and twiggles cheese snacks) that do not contribute to health were mentioned by some mothers as good food for the child's optimal growth and development, thus indicating their limited knowledge on healthy food choices for a growing child. Rolfes, Pinna and Whitney (2006:533) emphasized the importance of providing snacks that are as nutritious as foods served at mealtimes so that children who snack frequently and are not hungry at mealtimes could also benefit nutritionally from snacking. Although snacking was not frequently done by children in this community, it is still important that they get nutritious snacks that would contribute to their growth and development. Caregivers must be able to choose snacks that contribute to the nutritional requirements of the child to enable the child to grow and develop optimally. In this study, the crèche caregivers gave children healthier snacks such as fresh fruit, fruit juice, bread and peanut butter whereas most mothers gave unhealthy snacks such as chips (twiggles cheese snacks), shortbread biscuits, sweets, and concentrated cold drinks (such as Oros, Sweeto and Bibo). Only a few mothers (24.34%) gave their children healthy snacks such as fresh fruit, yoghurt and fresh full cream milk. Having a lot of money would not negatively influence the crèche caregivers' food choices in terms of healthy snacks as they would still give children fresh fruit as snacks. The crèche fees that mothers pay automatically included meals and snacks as part of the services, therefore children benefited from this as they were given healthier snacks at the crèche which was seldom the case at home. If a mother would not make a crèche payment and take the money home, she would probably be reluctant to spend that amount of money only on the child and would rather spend it on something else than special foods for the child.

In general, the caregivers believed that having a lot of money would enable them to buy healthy foods for the child and this is similar to what Kruger and Gericke

(2002:222) found in their study as most mothers considered money as important to eat healthily. All caregivers mentioned both healthy and unhealthy types of foods as the foods that would be given to the child for a healthy breakfast, lunch, dinner and snacks should they have a lot of money. For example, mothers would give a child food from the five food groups for a healthy breakfast and the choices made were mostly good ones with few bad choices. Breakfast foods included breakfast cereal or brown bread, fresh full cream milk, cheese or Melrose cheese spread, eggs (fried), polony, fruit juice, fresh fruit (apple, banana, pear), margarine, rooibos tea with sugar. Although some of the foods mentioned for a healthy breakfast are healthy foods, some should be taken in moderation. For example egg yolks should be limited to four per week due to their cholesterol content; and the intake of margarine should be limited. It is surprising to see foods such as porridge; potatoes and cabbage that are normally consumed at lunch or dinner appear on the list of foods mentioned as suitable for a healthy breakfast. This clearly shows lack of knowledge regarding suitable nutritious food choices for children at various meals of the day. The crèche caregivers however, mentioned several healthy foods (brown bread with peanut butter, rooibos tea with sugar and Cremora added, and a banana or jungle oats porridge or Kellogg's corn flakes or matabella porridge with fresh full cream milk) that could be given to the child for a healthy breakfast. Therefore, the crèche caregivers made good choices except for Cremora, which is a non-dairy creamer and therefore not recommended for children. Cremora cannot replace full cream milk as it does not supply the same amounts of nutrients as milk, therefore it should not be given to any child. The caregivers would rather be advised on using full cream powdered milk such as Nespray or Numel.

A healthy lunch would include rice or stiff maize meal porridge, chicken, baked beans, vitamin-A rich vegetables (cabbage, spinach, pumpkin, carrot, butternut, yellow pepper, green beans), Vitamin C-rich vegetables (potato, tomatoes, green pepper, cabbage) and mayonnaise. Condiments such as salt and cooking oil were commonly added when cooking foods like cabbage and spinach. Soup

powder was also commonly used for lunch and dinner. A healthy dinner would include similar foods as those included for a healthy lunch, but beef (cuts or mince) would also be included. In general, the caregivers made good food choices to be consumed by the child for a healthy breakfast, lunch and dinner. Although the consumption of certain food such as vitamin-A rich and vitamin-C rich vegetables, stiff maize porridge and rice was high at more than one meal time (e.g. lunch and dinner) it would be advisable for the caregivers to include variety in the child's food so that the child does not eat the same types of food repeatedly. Therefore, the importance of including good alternative types of food from the same food group to provide the same types of nutrients should be emphasized to attain good health and nutrition for the child. The mothers also included unhealthy types of snacks such as ice cream, cake, chocolate bar and twiggles cheese snacks indicating a serious need of imparting knowledge regarding appropriate food choices. Therefore the consumption of healthy snacks such as those mentioned by some mothers (e.g. yoghurt and fresh fruits) should be encouraged.

In order to attain good health and nutritional status, people need sufficient knowledge and skills to grow, purchase, process, prepare, eat and feed their families a variety of foods in the right quantities and combinations (Department of Health, 2002a:4; FAO, 1997:5 of 28). This requires a basic knowledge of what constitutes a nutritious diet and how people can best meet their nutritional needs from available resources. Therefore, the mothers in this community must use their existing resources (i.e. nutrition knowledge, which need to be improved, the income they control and the support they get from the crèche caregivers) to take proper care of their children. According to a study conducted by Sharma and Nagar (2006:141) in two rural villages of India, giving proper education (on aspects of childcare) to mothers enabled the majority of the mothers to negate their wrong beliefs and poor care practices. Therefore, it is important to emphasize that the child should consume adequate amounts of nutritious foods

(including drinks and snacks) from all the five food groups on a daily basis to ensure optimal growth and development.

4.3.10 Caring activities

Supervision of the child during meal times remained the responsibility of the mothers and the two crèche caregivers. This would be a challenge for the two crèche caregivers who cared for so many children as they would not be able to devote enough time to care for each child. The lack of time in itself is a major constraint to good child-care practices. Kulwa *et al* (2006:242) is of the opinion that important caregiver behaviours such as the level of encouragement provided to the child during feeding, the frequency of feeding, the quality of child-caregiver interaction and the environment in which feeding takes place influence children's intake of complementary foods. In this study, a caregiver looking after 18 or 27 children would not be able to pay full attention to each child during meal times or to ensure her involvement in feeding the child or assisting the child to eat. This is a serious problem for those children who require the caregiver's encouragement during feeding so that they can eat properly as this would affect their nutrition and health status. Both caregivers (the mothers and the crèche caregivers) generally served food in a hygienic environment as they cleaned regularly before and after mealtimes. However, in some instances mothers did not pay proper attention to the cleanliness of the environment in which the child ate as was the case with few children (n=2, 4%) who had their meals in an open space outside the house where there might have been many distractions to unable the child to consume the required amounts of food or where dirt particles could get into the food. Therefore, children should be fed in environments which are more conducive to optimal eating. According to Kulwa *et al* (2006:237; 240) hygienic practices should be assessed by spot-check observations using predetermined hygiene-related features such as the cleanliness of the caregiver, the child, the house compound and the latrine. This was not the case in this study as most mothers were interviewed at the crèche and therefore, the researcher did not

have the opportunity to observe such hygiene-related features in the child's home setting. The other shortcoming was that the researcher could not observe the crèche's environment during meal preparation, serving and consumption, but only relied on what the caregivers mentioned and observations during data collection.

4.3.11 Food preparation

Most of the mothers as well as the two crèche caregivers used boiling (in little water; e.g. rice, pumpkin, potatoes) and frying (in oil e.g. cabbage, onion, meat) as food preparation methods to prepare food for the child aged 3 to 5 years. Although rice, pumpkin and potatoes were boiled, sunflower oil was added towards the end of the cooking process to enhance the taste of these foods. Boiling in water as a food preparation method which could result in vitamin losses was the most frequently used method for preparing foods such as rice and different sauces in a study conducted by Avallone, Brault, Mouquet and Treche (2007:114) and the caregivers in this study only mentioned that they added little water – the question is how much water they really added and whether the amount of water added resulted in the loss of nutrients or not. Although steaming and boiling are food preparation methods that should be given preference over frying (in fat or oil), only a few mothers (16.90%) reported to have used steaming to prepare food for the preschooler. Therefore there is a need to impart knowledge regarding appropriate food preparation practices. According to Rolfes *et al* (2006:532) children seem to like raw vegetables better than cooked ones; therefore it would be wise to offer them slightly undercooked vegetables. For example, when boiling vegetables, it is important to use small amounts of water and not boiling for a long time so as to preserve the nutrients in the food. The knowledge on food preparation is important since Kruger and Gericke (2002:220) found that food prepared for children were generally overcooked, usually with a lot of water to achieve a soft texture. All caregivers added salt and cooking oil (mainly sunflower) when preparing the child's food (e.g. potatoes, pumpkin,

cabbage, carrots, rice and meat) to improve taste. The addition of these condiments during the preparation of certain foods such as potatoes, pumpkin, cabbage, carrots, rice and meat (prepared for the child) has also been reported by Faber, Smuts and Benadé (1999:59) to improve the taste of foods. A majority (n=39, 78%) of the mothers also added a mild spice (e.g. mild curry powder) when preparing the child's food because children do not like spicy foods. This spice was also added to improve the taste of food. Rolfes *et al* (2006:532) state that the flavor of children's food should be mild because they have more taste buds.

4.3.12 Food intake pattern

The 24-hour recall was administered to determine the pattern of food intake as well as the types of food generally consumed by these children. Most of the children in this study had five meal times per day with exception of two children who had six meal times per day for reasons of hunger and satiety, stomach capacity and adequate growth as was found by Kruger and Gericke (2002:222). These children did not consume any food or drink in the early morning, but had breakfast as their first meal. It is surprising because children of this age group would normally cry when they wake up due to hunger or thirst and would want something to eat or drink. Although this was the case, there could have been some underreporting from the mothers because the researcher only used a single 24-hour recall. The food intake pattern of the children in this study is shown below (see Table 4.25).

TABLE 4.25: FOOD INTAKE PATTERN

Food groups & types of food	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Fresh, full cream milk	11*		8*		5
Nespray	4		3		

Food groups & types of food	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Yoghurt (Clover danone)		2		6	
Inkomazi			8*		6
Mayo drinking yoghurt				1	
Peanut butter	15*	1		1	
Chicken feet	1				1
Eggs	1		1		
Chicken			5		12*
Beef			5		5
Tinned fish			2		3
Polony			1		
Baked beans (tinned)			1		
Chicken gizzards					4
Wors					1
Chicken livers					1
Sorghum meal soft porridge	9				
Brown bread	33*	8	4	3	1
Jungle oats	4				
Kellog's corn flakes	3				
Biscuits, short bread		12		12	
Maize porridge	1		43*		46*
Morvite	1				

TABLE 4.25 CONTINUED

Food groups & types of food	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
White bread	1				
Rice			3		3

Food groups & types of food	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Macaroni			1		
Banana		13		16*	
Apple		6	1	10	1
Strawberry				1	
Cabbage			8*		11*
Onion			6		10
Tomato			6		6
Spinach			6		5
Pumpkin			1		1
Beetroot			1		1
Green pepper			1		1
Potatoes					4
Rama margarine	10	2	2	1	
Non-dairy creamer (Cremora)	10*	1	1		
Rondo margarine	2				
Sunflower cooking oil			20*		24*
Water	4	38*	18	27*	8
Salt, fine	1		23*		34*
Rajah curry, mild	1		11		19
Twiggles cheese snacks (chips)		31*		31*	
Sweets (lollipop, choc éclairs)		5		11	

TABLE 4.25 CONTINUED

Food groups & types of

	Breakfast	Mid-morning	Lunch	Mid-afternoon	Supper
Five roses tea		1			
Oros (concentrated drink)		2	1	3	
Sweeto (concentrated drink)			2	2	
Soup powder (royco or knorrox)			3		7
Beef stock cubes			1		
Tomato sauce			1		
Aromat			1		1
Sugar	42*	4	1		
Rooibos tea	34*	3	1		

* Most commonly consumed foods in each meal category

There was a wide variety of food items that the mothers gave to their children for breakfast, lunch and supper. This may be due to the fact that these were the main meals of the day whereby the child had to eat for satiety or to fill his/her stomach. The children in this study consumed a cereal-based diet with maize meal porridge and bread (brown) as staple foods. Similar findings were reported by Vähätalo, Mikkilä and Räsänen (2005:369; 370) in their study of schoolchildren's food consumption and dietary intake in Namibia whereby maize meal porridge and bread formed the foundation of the diet for most of the children living in town; Faber *et al* (2001:406-408) in their study conducted in KwaZulu-Natal; (Ndunakazi) whereby children consumed maize meal stiff porridge (*Phutu*), bread and rice and beans as staple foods. In this study, maize porridge was consumed during lunch and dinner and was consumed in combination with other foods such as cabbage, meat (chicken or beef) and milk (fresh or sour). Poor between-meal snacking (commercial crisps such as twiggles cheese snacks) was reported in this study as was the case in Kruger and Gericke's (2002:222), and Faber *et al* (1999:59) studies. Bread was consumed spread mainly with margarine or peanut butter together with tea with sugar and

non dairy creamer, which mothers regarded as milk. Sugar was highly consumed because it was added in tea, sorghum meal soft porridge and sometimes in jungle oats porridge. Therefore, nutrition education in terms of healthy food choices and the promotion of their uses is highly recommended for this community.

There was greater variety of foods consumed at the crèche than at home. Although the 24-hour recall for the children at the crèche shows that they ate different types of foods, it should be kept in mind that the data from the two caregivers was collected in two different days and under normal circumstances, the children ate the same kinds of foods. The 24-hour recall administered at the crèche showed that the children's breakfast lacked foods from the fats and oils food group and protein-rich foods (no food from the meat and meat substitute food group) whereas their lunch did not always include protein-rich foods from the same food group. The implications of the diet deficit in protein would have a negative effect on the nutritional status of children as they require adequate amounts of nutrients supplied by foods from all the five food groups to maintain good health and nutrition. An important point to keep in mind is that these caregivers did not receive any nutrition courses; therefore, they do not have the necessary nutrition background that they can translate into healthy food choices to give to a child.

Most children's eating patterns were the same during the week and on weekends, supporting the finding that there was little variation in their diets which could predispose them to low micronutrient intakes as was reported by Faber *et al* (1999:63). Very few mothers indicated that their children had less than five meals on weekends with the mid-morning and afternoon snacks being missed. Therefore, the eating pattern at the crèche was introducing the snacking system, which was not practiced at home. If the mothers could all adopt this eating pattern and be influenced to give children healthy snacks as those consumed at the crèche, then this would be good for children's nutritional status. Obviously,

mothers did not have the knowledge about the importance of snacks in the child's diet. Although the caregivers reported the consumption of certain food items, the likelihood of underreporting or over reporting during a single 24-h recall cannot be ignored (Faber *et al,* 2001:408) as might be the case in this study. A single 24-h recall only assesses one day of the subject's life, and therefore, intra-individual (day-to-day or season-to-season) variation in food consumption is not captured (Vähätalo *et al,* 2005:373). Therefore, it would have been good to have a record of food intake over the weekends to see whether similar foods consumed during the week were also consumed over weekends, which might not be the case. However, it should be kept in mind that the purpose of the 24-hour recall for this study was to capture habitual food intake but not to assess dietary intake.

4.3.7 Association of care practices and nutrition knowledge

The results of the Fisher's Exact Test showed that there were no statistical significant differences between the two nutrition knowledge score groups with regard to the various aspects of care such as the mother's educational level; the mother's employment status; control of household income; access to and use of household electrical appliances; and storage of certain food items such as maize meal; bread, vegetables and cooked foods. For example, the mother's level of education or employment status or control of household income did not make a significant difference to her nutrition knowledge. Kulwa *et al* (2003:242) did not find any significant association between the mother's educational level and the likelihood of exclusive breastfeeding (which determines the mother's nutrition knowledge with regard to child feeding practices), but reported a significant positive association between the number of years a mother spent at school and the age at which she introduced complementary foods to the child (also part of nutrition knowledge). In other words, the number of years mothers spend at school may raise her level of nutrition knowledge a bit, depending on what she is taught and whether that relates to nutrition knowledge. This contradicts with the

findings of Räsänen, Niinikoski, Keskinen, Helenius, Talvia, Rönnemaa, Viikari and Simell (2003:73; 75) whereby the parents' level of basic education had an impact on their nutrition knowledge (i.e. parents with academic education had the highest nutrition knowledge scores). It should be kept in mind that the nutrition knowledge test they used was different (asked in-depth nutrition concepts) from the one used for this study. The parents' income level was not related to nutrition knowledge (Räsänen *et al,* 2003:75) as was the case with the mothers' employment status in this study. The only statistical significant difference (on the 10% level) for this study was that more (22.92%) mothers with a higher nutrition knowledge score used steaming as a good food preparation method as compared to very few (4.35%) mothers who used steaming.

CHAPTER 5: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

The aim of this study was to investigate the caring capacity of caregivers of pre-school-age children (between 3 and 5 years old) in a resource-poor peri-urban community (Olievenhoutbosch) situated in the Gauteng province of South Africa. The word 'caregiver' in this study refers to the child's mother and/ or crèche caregiver who provide appropriate care to the child unless otherwise specified. The conclusions will give answers to the following research problem: "What are the caring capacities of caregivers of pre-school-age children aged three to five years?" This chapter is divided into the following sections:

- Significance of the study,
- Measurements,
- General summary of the sample,
- Summary of results,
- Association of care practices and nutrition knowledge,
- Conclusions, and
- Recommendations.

5.2 SIGNIFICANCE OF THE STUDY

The literature reviewed in the first two chapters of this script revealed that malnutrition is a major problem worldwide as well as in South Africa and is most prevalent in vulnerable groups such as pre-school-age children. Although malnutrition is the outcome of many complex and interrelated factors such as food insecurity, lack of health services, sanitation, knowledge, education and care (FAO, 1997:5 of 28), most literature has in the past focused more on food security to address malnutrition. The importance of other aspects such as cultural and behavioural factors (including **care-giving** behaviour for good nutrition) in children's nutrition, particularly with regard to feeding, has only recently been recognized (Engle *et al*, 2000:25). It is important, therefore, to address the

problem of malnutrition in all areas simultaneously, so as to improve the nutritional status of vulnerable and affected groups, and to ensure optimal nutrition for all. Therefore, this study which investigated the nutrition-related caring capacity of caregivers of pre-school-age children to help address malnutrition as a nutrition-related problem, is of great significance, since it would help to identify and correct poor caring practices (such as lack of proper nutrition knowledge by the caregivers) and to promote good caring practices which would contribute to the child's optimal growth and development.

Several studies proved that good care practices could compensate for the negative effects of poverty and low maternal schooling on children's nutritional status. Although care is a multidimensional concept, the focus of this study was only on nutrition-related aspects of care. Cognitive or psychological aspects of care were not addressed in this study due to limitations in time, budget and the nature of this study, which is a script. The study was restricted to only one resource-poor peri-urban community with a limited number of respondents (N= 50).

5.3 MEASUREMENTS

A cross-sectional research design, using a quantitative research approach with qualitative aspects was implemented to attempt to answer the research question. A pilot study was conducted to test and refine the questionnaire used for data collection. The questionnaire covered the following aspects: biographic information of both the caregivers (mothers and crèche caregivers) and children, resources for care available to and used by caregivers, and caring activities performed towards the child. The nutrition knowledge of the caregivers was assessed with a nutrition knowledge test consisting of components of a nutritious diet, appropriate food choices, and hygienic handling, preparation and storage of

food. Finally a 24-hour recall of food intake was conducted to assess the children's eating patterns.

The questionnaire was administered to a sample of caregivers (50 mothers and two crèche caregivers) of pre-school-age children as key informants for this study. Observations were also used to gather certain information. A non-probability sampling technique, namely, convenience or accidental sampling was used to select the sample for this study. A sample of fifty mothers and two crèche caregivers was interviewed on how they cared for their pre-school-aged children at home as well as at the crèche. Direct informed consent was given by all respondents to participate in the research. The data were analysed by a statistician from the University of Pretoria using appropriate statistical methods such as descriptive statistics, using the SAS computer program. Combined frequencies were done on all variables and the Fishers's Exact test was used to test the relationship between the mothers' nutrition knowledge and the following aspects of care: educational level, employment status, control of household income, use of household electrical appliances, food preparation and food storage methods used.

5.4 GENERAL SUMMARY OF THE SAMPLE

All the caregivers in this study were women from different age groups, educational backgrounds, income groups and social classes. The majority (n=46, 92%) of mothers were still young (below 40 years of age) and have completed secondary school education (n=44, 88%). Most mothers (n=30, 60%) were unmarried, but lived with a partner and were employed (n=26, 52%) outside the home. Although the majority of mothers were employed, a high proportion (n=36, 72%) also relied on social security grants (mainly child support grants which was R190 in 2006) as additional income to help care for the child. These women, irrespective of their different backgrounds, played different roles that would contribute towards caring for their children.

All the children included in the study were aged from 37 to 68 months, which were appropriate age groups for this study. There was a fairly equal distribution of both genders – 24 male and 26 female preschoolers. The majority of the preschoolers (n=45) were attending crèche. Most children (n=35) in this study were the youngest (under the age of six years) in their households.

5.5 SUMMARY OF RESULTS

The findings of this study attempted to answer the main research problem, namely: "What are the caring capacities of caregivers of pre-school-age children aged three to five years?" The answers to this research problem would be given under each of the following sub-problems which addressed the components of care:

- What are the resources for care that caregivers of pre-school-age children use as part of caring capacity?
- What is the nutrition knowledge of caregivers of pre-school-age children as part of caring capacity?
- What are the caring activities that caregivers of pre-school-age children use as part of caring capacity?

5.5.1 Resources for care

The mothers had human, economic and organizational resources that would help in child caring practices. The human resources available to the caregivers were formal education, time (although not enough) and social support. Although all caregivers in this study had access to formal education, their education could not help them to fully perform good care practices towards their children, for example, they were not taught to choose and give healthy types of food to the child because nutrition was never part of their educational curriculum. This issue

has been addressed in the South African school system where schooling is now focused on an outcomes-based approach and includes subjects like Life Orientation which is compulsory for all students up to grade 12 where amongst others basic life skills (including nutrition and dietary behaviours as one of the categories of risk behaviours) are taught (Department of Education, 2006:35 & 57). However, those who would have finished school before 2006 (grade 9) or 2009 (grade 12) would still have the gap in their basic education.

Time as part of the human resources was another factor that could impact negatively towards child care. The caregivers' workload was unreasonable, making it impossible for them to properly care for the preschoolers. This is based on the fact that most mothers were employed outside the home and had other additional responsibilities (e.g. cleaning the house, cooking food for other household members, washing dishes, washing and ironing clothes, buying groceries); and the crèche caregivers cared for a huge number of children. Most mothers lacked access to electricity and household electrical appliances (such as stoves, refrigerators, kettles or microwave ovens) that could simplify household chores and give them plenty of time to take proper care of themselves and the child. This is another time constraint that could have a negative effect on proper childcare.

The mothers had social support from crèche caregivers as most children (except five) were left under their care while mothers were working or out looking for work. Although the mothers used crèche caregivers as alternative caregivers, the quality of care the child received at the crèche could be affected due to the number of children (18 and 27) being cared for by each of the two caregivers. Therefore, the children would not receive the same quality of care as compared to the full attention from a mother at home. With all the constraints mentioned, the caregivers merely looked after the children.

The majority of mothers (n=26) worked outside the home to earn income (economic resource) to help them provide for child care needs (e.g. buy food and clothes for the child, pay the child's school fees). These mothers were doing informal jobs (i.e. mostly domestic work at other people's homes) which paid them little and hence they did not receive any money from the children's fathers. Most (n=36, 72%) mothers, both employed and unemployed, relied on the government's social security grants, mainly on child support grants (R190 per month in 2006) and less on old age pension to supplement their income to contribute to child care. Most mothers had control over the household income (economic resource) that was allocated for childcare, and therefore it was possible to direct most of the income and other resources towards caring for the child or perhaps even the household.

The crèche served as an alternative child care facility for the mothers as it was the place where the majority of mothers (n=45) left their children to be cared for in their absence. The crèche caregivers provided social support as alternative caregivers when the mothers were not available to care for their children. Therefore, the crèche served as an organizational resource whereas crèche caregivers served as human resources in times of need (only during weekdays). Although the caregivers had access to resources for care, the resources were limited (as discussed above) to enable them to take proper care of the preschoolers.

5.5.2 Nutrition knowledge

The caregivers' nutrition knowledge plays a crucial role in the child's optimal growth and development as having proper nutrition knowledge and the application thereof would improve the child's nutritional status. In order to investigate the caregivers' nutrition knowledge, questions were asked on the basic components of a nutritious diet, appropriate food choices for preschoolers and hygienic food handling, preparation and storage.

(i) Components of a nutritious diet

The caregivers knew something about nutrition because they had knowledge of certain foods known to be good for the child's growth and development. For example, most of them mentioned foods from four of the five food groups (grains & grain products, milk & milk products, meat & meat substitutes and fruits and vegetables) - fats and oils were not always mentioned. Socialization played an important role in imparting knowledge to mothers, as all caregivers learned from their mothers and grandmothers that porridge and milk are important foods for the child's growth and development. Maize porridge was the most popular and frequently consumed food, and it was usually served with a vegetable or milk (fresh and/or sour) or cheaper types of food from the meat and meat substitute group such as tinned fish. The consumption of meat was very low due to strong cultural beliefs that meat was unsuitable for children as it would cause worms. The high cost of meat was another reason to explain its infrequent consumption, as cheaper types of meat such as chicken and minced beef were more preferred than the most expensive types such as beef, mutton and pork. Since meat consumption was low, the caregivers did not have adequate knowledge regarding good meat substitutes that would provide the amount and quality of proteins necessary for child growth as would be found in meat. Their substitution choices included commercial soup powders (which is only a flavouring agent rather than a protein), spinach and potatoes (which are vegetables) and orange over eggs or legumes. The diets usually lacked variety since the most frequently consumed staple food, maize porridge was served with only one relish from the milk and milk products or meat and meat substitute food groups or a vegetable. The situation was different when rice was consumed (mostly on Sundays) as it was served with other types of foods from the three or four food groups combined in one meal, which added more variety.

Although the caregivers knew the basic broad nutrition concepts, they lacked detailed knowledge regarding functions of certain foods and how they could include certain types of foods in the child's diet to improve the nutritional status and to improve the diversity of their diets. The caregivers knew that it was important that the child consume porridge, milk, meat and water, but they could not provide any nutritionally sound reasons to support their choices. The following misconceptions were reported:

- "porridge gives proteins to build bones";
- "porridge provides proteins";
- "milk gives energy";
- "milk cleans the stomach";
- "meat gives energy";
- "meat has proteins for strong bones and teeth";
- "meat will make the child strong";
- "minced meat is easy to digest"; and
- Water should be consumed to aid digestion and to pass the food.

(ii) Appropriate food choices

The caregivers (more especially the child's mother) lacked knowledge regarding appropriate food choices for the children. This was clearly indicated in their choices of non-nutritious foods and snacks (e.g. commercial soup powder, chips or twiggles cheese snacks, shortbread biscuits, sweets, chocolate, cake, ice cream and concentrated cold drinks such as Oros, Sweeto and Bibo) that do not contribute to health as good food for the child's optimal growth and development, thus indicating their limited knowledge on healthy food choices for a growing child. The crèche caregivers had better knowledge regarding healthy food choices as they gave children healthier snacks such as fresh fruit; fruit juice, bread and peanut butter which was seldom the case at home. Although the crèche caregivers had better knowledge regarding healthy food choices, they believed that giving a child an apple would help to strengthen his/her teeth and

that cremora (a non-dairy creamer) could replace fresh full cream milk in the child's diet, just like mo, because they associated healthy eating with expensive types of foods like polony, beef, cake, ice cream – of which are not the most nutritious foods. The caregivers mentioned mostly healthy types of food as compared to unhealthy types of food to be given to the child for a healthy breakfast, lunch and supper, but there was no diversity in the diet, as the same types of food were consumed over and over for lunch and supper. This indicates a serious need of nutrition education regarding healthy food choices (including drinks and snacks) and good alternative types of food from the same food group, to provide the same types of nutrients and to add variety to the child's diet, so as to attain good health and nutrition for the child.

(iii) Hygienic food handling, preparation and storage

The caregivers mentioned that they handled food with clean hands and would not allow a child to eat without washing hands. One limitation of this study was that it did not probe more on hygienic food handling, preparation and storage, but focused on food preparation and storage methods used. There were no spot-checks to assess hygienic practices regarding food handling, preparation and storage. Researchers such as Kulwa *et al* (2006:237; 240) recommended that hygienic practices should be assessed by spot-check observations using predetermined hygiene-related features such as the cleanliness of the caregiver, the child, the house compound and the latrine. Abate *et al* (2001:7 of 10) also emphasized the importance of good personal and household hygiene practices that are necessary for optimal child care practices. This was not the case in this study, as most mothers were interviewed at the crèche, and therefore the researcher did not have the opportunity to observe such hygiene-related features in the child's home setting. The other shortcoming was that the researcher could not observe the crèche's environment during meal preparation, serving and consumption, but only relied on what the caregivers mentioned, and on observations during data collection, such as the crèche's surroundings,

classrooms and cooking facilities. From observations during data collection, pieces of rubbish were spotted in the crèche's surroundings, and this could be improved by encouraging the use of rubbish bins or plastic bags rather than littering. The floors in the classrooms and kitchen were not scrubbed. Some dirt was spotted and this has serious hygiene implications. It is of great importance to improve the hygiene in the classrooms and kitchen (e.g. floors should be scrubbed on a daily basis with warm soapy water) as these were the places where food preparation, serving and consumption took place.

5.5.3 Caring activities

(i) Foods consumed by the child for nourishment

The children in this study consumed five meals daily, for reasons of hunger and satiety, stomach capacity and adequate growth. Breakfast, lunch and supper formed the three main meals of the day where there was a wide variety of food items to give to the child. The children consumed a cereal-based diet with maize porridge and bread (brown) as staple foods. Porridge was eaten in combination with other foods, such as cabbage, meat (chicken or beef) and milk (fresh or sour). Bread was consumed spread mainly with margarine or peanut butter, together with tea with sugar and non dairy creamer, which mothers regarded as milk. Children in this study were given non-nutritious snacks (commercial crisps such as twiggles cheese snacks) at home, as compared to nutritious snacks (such as yoghurt or a peanut butter sandwich with full cream milk and fresh fruit) consumed at the crèche for in-between meals. There was little variation in the children's diets, since most mothers would give the child the same kinds of foods during the week and over weekends. Some mothers did not have the knowledge regarding the importance of snacks in the child's diet as they allowed their children to miss the mid-morning and afternoon snacks during weekends.

(ii) Food preparation methods used

The most commonly used food preparation methods were boiling (in little water; e.g. rice, pumpkin, potatoes) and frying (in oil e.g. cabbage, onion, meat). Although rice, pumpkin and potatoes were boiled, sunflower oil, salt and/ or mild spices were added towards the end of the cooking process to enhance the taste of these foods. Most caregivers preferred boiling as a food preparation method, but there was no exact indication of the amount of water used, except that they used little water – the question is whether the cooking time and this small amount of water added did not result in overcooking of food and the loss of nutrients. The amount of oil used for frying was not mentioned. Although steaming or boiling are food preparation methods that should be given preference over frying (in fat or oil), only a few mothers (16.90%) reported to have used steaming to prepare food for the preschooler.

(iii) Food storage methods used

All foods were stored in the kitchen (at home) and in a store room for food (at the crèche). Foods such as maize meal and bread were stored properly in airtight containers in a cool place, but the storage of perishable vegetables and cooked food (left-over food) remained a problem for those mothers who did not have cooling facilities. The question here is how long cooked foods were stored as prolonged storage (beyond 24 hours) is one of the significant risk factors for malnutrition (Abate *et al*, 2001:6 of 10). Lack of access to electricity and certain electrical appliances, such as cooling facilities, could limit the consumption of perishable foods (e.g. meat and dairy products such as fresh milk, cheese, yoghurt) that requires refrigeration. The 24-hour recall for food consumed at home showed a limited consumption of milk (and other dairy products) and meat, with a maximum of eleven preschoolers who consumed fresh full cream milk (and very little of the dairy products) and only twelve who consumed chicken in a particular day. This could be related to children from households who owned and used a refrigerator or maybe milk and chicken were consumed only on that

particular day. It would have been better to have a 24-hour recall of the whole week or month, so as to determine the frequency of dairy products and meat.

(iv) Feeding practices undertaken

In most cases, children fed themselves under the supervision of mothers and the two crèche caregivers, but those who required help were assisted. This was a challenge for the two crèche caregivers who looked after so many children, as they were not able to devote enough time to assist each child. The lack of time in itself is a major constraint to good child-care practices. In this study, a caregiver looking after 18 or 27 children was not able to pay full attention to each child during meal times, or to ensure her involvement in feeding the child or assisting the child to eat. This is a serious problem for those children who require the caregiver's encouragement during feeding, so that they can eat properly, as this would affect their nutrition and health status. Both types of caregivers (mothers and crèche caregivers) generally served food in a hygienic environment, as they cleaned regularly before and after mealtimes. The limitation here was that the researcher was never present during meal times to observe the environment in terms of hygienic practices and actual serving of the food.

(v) Child care activities undertaken

Caring activities involved more than just food choices, food preparation, and feeding practices (giving the child food to eat or ensuring that the child eats). In addition to providing food for the child (buying food, cooking, feeding the child or supervision during meals), the caregivers' other responsibilities towards caring for the child included the following: ensuring that the child is safe when sleeping, playing with the child or supervising group play, and performing educational activities with the child. The child's personal hygiene also formed part of the caregivers' caring responsibilities (these could include bathing the child, washing the child's clothes, cleaning the place where the child stays etc.), all of the above

would contribute to the child's growth and development. The caregivers undertook other activities that indirectly contributed to the child's growth and development, for example, a mother would work outside the home to earn income that will pay for the child's crèche, buy the child's food and clothes. They would all strive to have their child in the crèche, in an attempt to improve the caring and education of the child.

5.6 Association of care practices and nutrition knowledge

Although the literature reviewed indicated a close association between care practices and nutrition knowledge, the results of the Fisher's Exact Test for this study showed no statistically significant differences between the two nutrition knowledge score groups with regard to the various aspects of care, such as the mother's educational level, the mother's employment status, control of household income, access to and use of household electrical appliances, and storage of certain food items such as maize meal, bread, vegetables and cooked foods. For example, the mother's level of education or employment status or control of household income did not make a significant difference to her nutrition knowledge. The only statistical significant difference (on the 10% level) found for this study was that more (22.92%) mothers with a higher nutrition knowledge score used steaming as a good food preparation method, as compared to very few (4.35%) mothers with a low nutrition knowledge score who used steaming.

5.7 CONCLUSIONS

From the findings of this study, it is concluded that the caring capacities of caregivers of pre-school-age children in this community highly depended on the availability and use of certain resources such as human resources (education, time and social support in terms of the availability of alternative caregivers), economic resources (having a job or any source of income) and organizational resources (e.g. child care facilities such as crèches). Having access to all or

some of these resources would enable caregivers to perform caring activities towards the child with ease. It is important to note that caring activities in this study involved more than just the provision of food (i.e. food choices, food preparation and feeding practices), but involved other important aspects such as allowing the child time to sleep and play (and sometimes play with the child), ensuring the child's hygiene (i.e. bathing the child, dressing the child, washing the child's clothes, cleaning the place where the child stays, plays, eats and sleeps) and performing educational activities with the child. All of these activities would contribute to the child's optimal growth and development. In order to properly perform these caring activities, there is a need for proper nutrition education which will impart knowledge in terms of the components of a nutritious diet, appropriate food (including drinks and snacks) choices that would enable caregivers to provide children with nutritious types of food in adequate amounts, to prepare (cook), handle and store food hygienically.

The mothers had limited resources such as human, economic and organizational resources that would help in childcare practices. Although human resources such as education, time and social support (having alternative caregivers) were available, they were not adequate to help the mothers to perform good care practices. For example, the type of education (formal education) that the mothers had could not help them in choosing and giving healthy types of foods to the child; the time they had was not sufficient for them to perform good care practices, and their workload was unreasonable since most of them were working, and had other additional responsibilities to take care of. Time was a serious constraint that could compromise the level of care provided by the two crèche caregivers.

Most women's control over the household income (economic resource) allocated for childcare could be directed towards caring for the child more efficiently if coupled with appropriate nutrition knowledge, for example, money could be spent in buying nutritious foods for the child if the caregiver has the knowledge about

appropriate food choices. The mothers had access to a crèche (organizational resource) and crèche caregivers who provided social support (human resource) by looking after their children (during weekdays) while the mothers were either at work; looking for a job, or at home doing other chores.

The caregivers in this study still adhered to some cultural values (good and harmful) in terms of foods given to the child. Although all the caregivers had basic nutrition knowledge, there is a serious need for proper nutrition education in terms of appropriate food choices; components of a nutritious diet (healthy types of foods, drinks and snacks); functions of foods in the child's body; hygienic food handling, preparation, and storage methods that would be translated into good care practices and contribute to the child's optimal growth and development. If the caregivers have and utilize this kind of knowledge coupled with access to resources (e.g. time, income; alternative caregivers) that would enable them to take proper care of the child, then they would be able to change their current limited nutrition knowledge, attitudes and practices for the benefit of the child's optimal growth and development. Wenhold *et al* (2007:331) emphasise that nutrition education can only change people's lives for the better if they had the means and opportunities to act on knowledge. It is through nutrition education that people (particularly caregivers of preschool-age children) would become aware that their care practices are strong determinants of children's nutritional status. According to the Department of Health (2002a:4) one of the broader strategies to improve the nutritional status of all South Africans is to improve nutrition knowledge, behaviour, perceptions and attitudes of the population through nutrition education.

Based on the above conclusions, it is critical to ensure that women, as the primary caregivers of children, have all the necessary resources to perform good care practices. The following should not be overlooked: enhancing women's decision-making power in the household, the time demands on women, and increasing women's education and nutrition knowledge to fill the gaps.

5.8 RECOMMENDATIONS

Based on the findings of this study as well as the problems and challenges (limitations) experienced when conducting this study, the following recommendations are made to the following target groups:

- Caregivers (crèche caregivers and mothers); and
- Researchers (for future research)

5.8.1 Recommendations to the caregivers

- If sufficient funds are available, the crèche caregivers should get more qualified staff to help them perform their care practices with ease, and therefore reduce the time constraints they are currently faced with, which limits the quality of care given to each individual child.

- The crèche caregivers should get relevant training with regards to proper childcare (e.g. informal nutrition education training that would enable them to choose, handle, prepare, store and give nutritious types of foods to preschoolers) in order to improve the quality of care given to each child.

- All caregivers (crèche caregivers and mothers) should improve their nutrition knowledge so that they can use the knowledge in choosing, preparing and giving nutritious foods to the child.

In order to improve the nutrition knowledge of caregivers in this study, a nutrition education guide should be formulated to address the following:

- **Guidelines for healthy eating habits** (healthy food choices, the nutritional value and functions of specific foods in the diets and the value of dietary diversification (including a variety of food from different groups).
- The importance of snacking for the child and encouraging the use of healthy types of snacks.
- Eating pattern or food intake pattern of toddlers or preschoolers.
- Encouraging the daily consumption of water and other liquids (e.g. fresh full cream milk, rooibos tea, pure fruit juices).
- Encouraging hygienic food handling, storage and preparation methods.

(i) Guidelines for healthy eating habits

In order to disseminate this kind of information, different workshops could be conducted with the caregivers. For example, a poster (with pictures of foods) of the food based dietary guidelines would be used as a nutrition education tool to educate the caregivers about the different issues such as healthy food choices including snacks and drinks, the nutritional value and functions of specific foods in the diets and the value of dietary diversity. The workshop should be participatory in nature whereby the caregivers would also ask questions, give suggestions etc. This nutrition education workshop would also incorporate good cultural values with regards to the consumption of foods by the child, and discourage harmful values which are detrimental to the child's optimal growth and development.

The following information regarding the importance of including a variety of foods in the child's diet and how that can be achieved would first be given at the beginning of the workshop:

- In order to meet a diet that is balanced a child should eat a variety of foods (that is different foods from different food groups) since there is no

single food which provides all the nutrients in the required quantities (Department of Health, Guide to healthy eating:2).

- To simplify the compilation of a balanced diet, foods are classified into five food groups, each group including a variety of foods from which the caregiver can choose for the child according to the child's requirements for optimal growth and development and affordability of those foods (Department of Health, Guide to healthy eating:2).

- Combining different types of foods from the different food groups would also improve the diversity of the child's diet.

- The food-based dietary guidelines consist of nutrition education messages (see table 5.1) that promote healthy eating for healthy lifestyles among people. These messages encourage the inclusion of certain types of foods that the child should consume; the nutritive value of these foods as well as their importance in the child's body. Some of the types of foods were mentioned by the caregivers as good foods for the child's optimal growth and development, and some were usually given to the pre-school-age children in this community. This would enable the caregivers to choose healthy types of foods for the child, and to clear their misconceptions regarding the functions of certain types of foods.

TABLE 5.1: NUTRITION EDUCATION MESSAGES FOR HEALTHY EATING

Message 1: Make starchy foods the basis of most meals Starchy food should make up the main part of the meal, and other food should be served with them to provide extra nutrients.		
Types of foods	**Nutrients**	**Functions in the body**
Maize meal (fortified) porridge, rice, samp, mealie rice, pasta (macaroni or spaghetti), soft sorghum meal porridge, brown or white bread, Jungle oats, Morvite, Kellogg's corn flakes.	Carbohydrates (starch, fibre)	Provides the body with energy
Message 2: Eat plenty of vegetables and fruit every day We should eat at least 5 portions of vegetables and/or fruit every day. Add vegetables to the starchy food as a relish.		
Cabbage, spinach, green beans, carrot, pumpkin, butternut, yellow pepper, pineapple, mangoes, pawpaws, apricots, yellow peaches	Vitamin A	Essential for: - good vision, - healthy skin
Strawberry, orange, guava, naartjie, pawpaws, litchis, cabbage, potato, tomato, green pepper	Vitamin C A variety of other vitamins and minerals	Essential for: - formation & maintenance of body tissue, - absorption of iron & calcium, - healing of wounds, - increasing the body's resistance to Infections.

TABLE 5.1 CONTINUED

Message 3: Eat dry beans, peas, lentils and soya regularly Eat these foods at least three times a week with starchy foods.		
Dried beans (sugar beans, soy beans, speckled beans, small white beans, large kidney beans), cowpeas, lentils and chickpeas, baked beans (canned)	Protein, minerals and vitamins	Needed to build, repair and maintain our body's muscles and tissues
Message 4: Meat, fish, chicken, milk or eggs could be eaten daily Eat small portions of these foods every day.		
Meat: beef/ mutton (cuts), polony, sausage, **Fish:** fresh, tinned **Chicken:** portions, feet, gizzards, livers **Eggs, peanut butter**	Protein, iron, zinc, B- Vitamins	- Growth and maintenance of tissues - Formation of essential body compounds
Milk: fresh, full cream milk, full cream sour milk (Inkomazi), full cream milk powder (e.g. Nespray, Numel), yoghurt (Clover, Danone), cheese	Calcium, protein, vitamin B12	- Promotes tooth and bone growth - Promotes tissue maintenance
Message 5: Use fats sparingly		
Rama margarine, sunflower cooking oil	Specific vitamins and essential fatty acids	- Source of energy
Message 6: Enjoy a variety of foods Eat different types of foods from different food groups because one type of food does not contain all the nutrients we need. (see types of foods in messages 1- 5) as part of the diet.		

TABLE 5.1 CONTINUED

Message 7: Use salt sparingly Add very little or no salt to foods at the table and during cooking of meals. Limit the intake of processed foods (e.g. French polony).
Message 8: Drink lots of clean, safe water Drink sufficient amounts of clean, safe water regularly every day. Other fluids such as rooibos tea, pure fruit juices and full cream milk can also be consumed but none should take the place of water.
Message 9: Use food and drinks containing sugar sparingly and not between meals Food and drinks containing sugar should not be taken instead of mixed meals, but can be enjoyed in small amounts on special occasions or as a treat after a mixed meal.

Department of Health (2006)

This table would also help the caregivers to choose cheap, but nutritious alternative food items from different food groups (e.g. cheaper alternative foods for meat are eggs, dried beans, chicken portion etc.). It is also important to note that some food items such as Cremora, which is a non-dairy creamer, should not replace full cream milk in the diet, and should therefore not be used as a substitute for full-cream milk. It is therefore advisable to use full-cream milk powder such as Nespray and Numel, which are nutritious. Rondo margarine contains unhealthy fats and should not be used in the child's diet, but one can use Rama margarine as it has poly-unsaturated fats. Although salt (iodised) should be used, it is important to use it moderately.

(ii) Snacking

Snacking plays a very important role in the child's diet (Rolfes, 2006:533), therefore, it should not be discouraged, but it is important that caregivers give children healthy types of snacks that will contribute to their optimal growth and development. It is therefore advisable and recommended to choose snacks from the five food groups (see Table 5.1 above for the types of foods from each food

group). The following are examples of the type of foods that could be consumed as healthy snacks:

- Peanut butter/ cheese sandwich,
- Cereal with fruit and milk (e.g. Oats porridge with banana and fresh milk),
- Yoghurt,
- Cheese (a piece),
- Boiled egg,
- Luncheon meat (e.g. polony) on brown bread,
- Fresh fruits (depending on availability as some are seasonal, e.g. apples, banana, pear, peaches, oranges, naartjies, apricots, pawpaws, litchis, mangoes),
- Fruit juices (100%, e.g. Tropika, Liqui fruit, Ceres), and
- Raw vegetables (e.g. carrot sticks).

The caregivers should avoid or limit the use of the following foods as snacks:

- crisps (e.g. Twiggles cheese snacks and others),
- Biscuits (short bread),
- Sweets (e.g. candy, éclairs, lollipop etc.),
- Cola/ cold drinks (e.g. coke etc.),
- Other concentrated fruit drinks such as Oros and Sweeto, ready-to-drink fruit drinks such as Bibo, and
- Coffee and tea (with the exception of rooibos tea).

The latter types of foods are of poor or no nutritive value and some may interfere with the child's appetite (e.g. cola, candy, concentrated fruit drinks) and therefore, would not benefit the child's optimal growth and development. Money used to buy these unhealthy snacks can be used healthy types of snacks.

(iii) Eating pattern/ food intake pattern

A table with different meal times (see table 5.2) would be used so that the caregivers could indicate the types of foods they would give to a child at each meal time of the day. By this time they already have gained knowledge of different types of foods from the five food groups. This would encourage them to adopt and follow the five to six meal time pattern which is an acceptable pattern (already followed at the crèche) to spread the child's meals in a day. This can be done repeatedly to enable the caregivers to plan menus (using nutritious foods as given in the food-based dietary guidelines of from the five food groups and taking into consideration the availability, acceptability and affordability of the food) for different days of the week to avoid monotonous diets.

TABLE 5.2: MEAL PLAN

Meal time	Food groups	Examples of foods to give
Early Morning	Fluids or milk group or fruit	Rooibos tea
Breakfast	Grain group Milk group Fruit	- Soft sorghum porridge - Milk - Apple slices
Mid-morning	Grain group Protein group Drink	- Slice of brown bread - Peanut butter - Fruit juice
Lunch	Grain group Meat group Vegetables/salad Vegetable group	- maize porridge - Chicken breast - mashed pumpkin - cabbage
Mid-afternoon	Fruit group Drink	- banana - Rooibos tea
Supper	Grain group Meat group Vegetable/salad Vegetable/ salad Dessert (optional, e.g. fruit salad, pudding, custard etc.)	- rice - minced meat - boiled carrot sticks - spinach - fruit salad
Late night (optional)	Light snack	- glass of milk

Adapted from Department of Health, Guide to healthy eating

(iv) Hygienic food handling, storage and preparation methods

Although hygiene checks with regard to food handling, storage and preparation were not done in this study, it would be important to investigate how the caregivers take hygienic aspects into consideration to a certain extent. For example, demonstrations may be done using the crèche facilities to prepare and

store certain types of foods. This might involve that the caregivers take turns in preparing certain types of foods (e.g. vegetables, eggs, meat etc.) and demonstrating the storage of certain types of foods while the researcher and other caregivers watches the whole process and comment on it afterwards. In other words, the researcher observes how tidy the person handling the food is, whether she washes fruits and vegetables first, whether she uses clean equipment, how much water is added when boiling vegetables, how long they are boiled etc. This would be the best way to educate them about proper food handling, preparation and storage. The following simple hygiene messages would also be sent to the caregivers:

(a) Personal hygiene (Abate et al, 2001:4 of 10)

Anyone who handles foods and cooking equipment should always be clean, e.g.

- Wash your body daily in the morning and before you sleep;
- Cover your hair during food preparation;
- Cut your nails short and keep them clean;
- Do not cough or sneeze around food;
- Always wash your hands with clean water and soap before handling food;
- Keep your surroundings clean and neat; and
- Bathe regularly.

(b) Hygienic food handling (Abate et al, 2001:4 of 10)

- Wash hands (with soap and clean water) before handling food;
- Wash fruits and vegetables before consumption, preparation and storage;
- Your kitchen should be clean at all times;
- Wash all utensils before and after using them; and
- Ensure that the child washes his/her hands before handling food.

(c) Hygienic food storage (Abate et al, 2001:4 of 10)

- Cover food (use fly screen for food) and drinking water;

- Store foods in a cool place;
- Refrigerate left-over foods; and
- Those without refrigerators should cook only enough food for the meal to ensure that no left-over foods are kept overnight.

(d) Hygienic food preparation (Abate et al, 2001:4 of 10)

- Wash hands before and during food preparation;
- Always prepare foods in a clean place; and
- Use clean equipment for food preparation.

5.8.2 RECOMMENDATIONS FOR FUTURE RESEARCH

- Based on the small sample size (n=50), which is not representative of the population in question (i.e. all caregivers of preschoolers), the external validity of the results is questioned, as these results cannot be generalised to the whole population. A study like this should include a bigger sample which would give the profile of preschoolers in the whole community so that care practices applicable to all preschoolers in the community are reported and observed to enable a researcher to come up with solutions that would be applicable to all preschoolers in the community. In other words, all types of caregivers should be explored to find out about their caring capacities and practices and to find out what resources they have, and whether this makes a difference between their caring capacities or not. This would allow comparisons between caregivers as it was not the case with this study (i.e. it was not statistically possible to compare fifty mothers against two crèche caregivers).

- In order to test the reliability of the results, it is recommended that the study be repeated to the same respondents using the same instruments to see whether similar results can be obtained.

- This study used a cross-sectional research design, whereby data was collected at a single point in time, and did not allow the researcher to measure change over time. For future research, a longitudinal study which involves examining the same respondents at different time intervals is recommended, as it would give a clear picture of actual events, e.g. what the child usually consumes during different times, days and seasons of the year. This type of a design would also give the researcher an opportunity to find out whether the intervention (e.g. nutrition education) did bring positive changes or not as far as child care is concerned.

- Further studies should include more observations in the settings of the children, that is, in their homes (which was not the case with this study). This would enable the researcher to obtain first-hand information by observing hygienic aspects (personal, household or environmental conditions) in terms of food preparation, handling, storage, serving and consumption practices.

- Further research in the field of testing nutrition knowledge (using a validated nutrition knowledge test) of different types of caregivers is required (taking into consideration their educational background which in most cases did not include nutrition) and this should ask enough questions about specific aspects of nutrition knowledge and whether the knowledge is applied or not. If the knowledge is applied, does it make a difference in terms of the nutritional status of children? Therefore, the use of suitable nutrition knowledge tests (to the target group) should be explored.

- Further research should focus on the use of informal educational methods such as the use of mass media (e.g. radio and/ or television) to impart nutrition knowledge in simple, understandable language.

LITERATURE REFERENCES

ABATE, G, KOGI-MAKAU, W & MUROKI, NM. 2001. Hygiene and health-seeking behaviours of households as predictors of nutritional insecurity among preschool children in urban slums in Ethiopia – the case of Addis Ababa. *S A J Clin Nutr* 14(2):56-61.

AVALLONE, S, BRAULT, S, MOUQUET, C & TRECHE, S. 2007. Home-processing of the dishes constituting the main sources of micronutrients in the diet of preschool children in rural Burkina Faso. *International Journal of Food Sciences and Nutrition* 58(2):108-115.

BABBIE, E & MOUTON, J. 2001. *The practice of social research.* Cape Town. Oxford University Press.

BLESS, C & HIGSON-SMITH, C. 2000. *Fundamentals of social research methods.* 3rd edition. Cape Town. Juta.

BOUIS, H & HUNT, J. 1999. Linking food and nutrition security: Past lessons and future opportunities. *Asian development Review* 17 (1 & 2):168-213.

CHEVASSUS-AGNES, S. 1999. *Anthropometric, health and demographic indicators in assessing nutritional status and food consumption.* [WWW document-26/1/03]. URL http://www.fao.org/sd/Wpre0125.htm

COUTSOUDIS, A, MAUNDER, EMW, ROSS, F, NTULI, S, TAYLOR, M, MARCUS, T, DLADLA, AN & COOVADIA, HM. 2000. *A qualitative study on food security and caring patterns of vulnerable young children in South Africa*. World Health Organization.

DANNHAUSER, A, JOUBERT, G & NEL, M. 1996. Nutritional status of preschool children in the Bloemfontein district. *S Afr J Food Sci Nutr* 1(8):14-21.

DEPARTMENT OF EDUCATION. 2006. *National curriculum statement Grade 10 – 12. Teacher Guide. Life Orientation.* South Africa. Department of Education.

DEPARTMENT OF HEALTH SERVICES AND WELFARE. Guide to healthy eating. Pretoria. Department of Health Services and Welfare.

DEPARTMENT OF HEALTH. 2000. *Integrated Nutrition Programme. A foundation for life.* Issue 2. South Africa. Department of Health.

DEPARTMENT OF HEALTH. 2002a. *Integrated Nutrition Programme. A foundation for life.* Issue 3. South Africa. Department of Health.

DEPARTMENT OF HEALTH. 2002b. *Integrated Nutrition Programme.* Strategic Plan 2002/03 to 2006/07. South Africa. Department of Health.

DEPARTMENT OF HEALTH. 2006. A guide to healthy eating. Pretoria. Department of Health. Directorate Nutrition.

ENGLE, PL, MENON, P & HADDAD, L. 1997. *Care and nutrition. Concepts and measurement.* Washington, D. C. International Food Policy Research Institute.

ENGLE, PL, BENTLEY, M & PELTO, G. 2000. *The role of care in nutrition programmes: current research and a research agenda.* Proceedings of the nutrition society. 59: 25-35.

FABER, M, SMUTS, CM & BENADÉ, AJS. 1999. Dietary intake of primary school children in relation to food production in a rural area in KwaZulu-Natal, South Africa. *International Journal of Food Sciences and Nutrition* 50(1): 57-64.

FABER, M & BENADÉ, AJS. 2002. *A household food-production programme to address vitamin A deficiency: A South African experience*. Tygerberg. Medical research Council.

FABER, M, JOGESSAR, VB & BENADE, AJS. 2001. Nutritional status and dietary intakes of children aged 2-5 years and their caregivers in a rural South African community. *International Journal of Food Sciences and Nutrition* 52:401-411.

Food and Agricultural Organization (FAO). 1997. *Agriculture Food and Nutrition for Africa – a resource book for teachers of agriculture.* [WWW document – 20/9/2001]. URL http://www.fao.org/docrep/woo78e/woo78e.htm

FAO. 2001. *Targeting for nutrition improvement: Resources for advancing nutritional well-being.* Rome. FAO.

GREEN, F. 2003. *A community based model for nutritional interventions.* Research proposal. Department of Consumer science. University of Pretoria.

HUYSAMEN, GK. 1998. *Descriptive Statistics for the social and behavioural sciences*. Pretoria. Van Schaik.

JONSSON, U. 1995. *Ethics and child nutrition.* [WWW document - 17/10/2005]. URL http://www.unu.edu/unupress/food/8F164e/8F164E03.htm

KAMUDONI, P & MALETA, K, SHI, Z & HOLMBOE-OTTESEN, G. 2007. Infant feeding practices in the first 6 months and associated factors in a rural and semiurban community in Mangochi District, Malawi. *J Hum Lact* 23(4):325-332.

KANDIAH, J & JONES, C. 2002. Nutrition knowledge and food choices of elementary school children. *Early Child Development and care* 172(3):269-273.

KASSIER, S, MAUNDER, E & SENEKAL, M. 2003. Infant feeding practices in KwaZulu-Natal. *An exploratory study of current infant feeding practices of mothers with 0-6 month old infants attending PMTCT and non-PMTCT clinics in Central Durban.* University of Kwa-Zulu-Natal. Health Systems Trust.

KERR, RB, BERTI, PR & CHIRWA, M. 2007. Breastfeeding and mixed feeding practices in Malawi: Timing, reasons, decision makers, and child health consequences. *Food and Nutrition Bulletin* 28(1):90-99.

KRIGE, MU & SENEKAL, M. 1997. Factors influencing the nutritional status of pre-school children of farmworkers in the Stellenbosch district. *S Afr J Food Sci Nutr* 1(9):14-23.

KRUGER, R & GERICKE, G. 2001. Breastfeeding practices of mothers with children (aged 0 – 36 months) in a rural area of South Africa. A qualitative approach. *Journal of Family Ecology and Consumer Sciences* 29: 60 – 71.

KRUGER, R & GERICKE, G. 2002. A qualitative exploration of rural feeding and weaning practices, knowledge and attitudes on nutrition. *Pub. Health Nutr.* 6(2):217-223.

KULWA, KBM, KINABO, JLD & MODEST, B. 2006. Constraints on good child-care practices and nutritional status in urban Dar-es-Salaam, Tanzania. *Food and Nutrition Bulletin* 27(3):236-244.

KUMAR, R. 1999. *Research methodology. A step-by-step guide for beginners.* London. Sage.

KUMAR-RANGE, SK, NAVED, R & BHATTARAI, S. 1997. *Child care practices associated with positive and negative nutritional outcomes for children in Bangladesh: a descriptive analysis.* [WWW document - 08/9/2004]. URL http://www.ifpri.org/divs/fcnd/dp/dp24.htm

LATHAM, MC. 1995. *UNICEF-Cornell colloquium on care and nutrition of the young child – Overview.* [WWW document – 17/10/2005]. http://www.unu.edu/unupress/food/8F164e/8F164E01.htm

LEE, RD & NIEMAN, DC. 2003. *Nutritional assessment.* 3rd edition. London. McGraw-Hill Publishers.

LEEDY, PD. 1993. *Practical research. Planning and design.* 5th edition. New York. Macmillan.

MACHARIA, CW, KOGI-MAKAU, W & MUROKI, NM. 2004. Dietary intake, feeding and care practices of children in Kathonzweni division, Makueni district, Kenya. *East African Medical Journal* 81(8):402-407.

MACHARIA, CW, KOGI-MAKAU, W & MUROKI, NM. 2005. A comparative study on the nutritional status of children (6-59 months) in a world vision project area and a non-project area in Kathonzweni division, Makueni district, Kenya. *African Journal of Food Agriculture and nutritional development* 5(1): 1-13.

MACINTYRE, UE, DE VILLIERS, FPR & BALOYI, PG. 2005. Early infant feeding practices of mothers attending a postnatal clinic in Ga-Rankuwa. *S Afr J Clin Nutr* 18(2): 70-75

MOUTON, J. 1996. *Understanding social research.* Pretoria. Van Schaik.

MOUTON, J. 2001. *How to succeed in your master's & doctoral studies. A South African guide and resource book.* Pretoria. Van Schaik.

PELTZER, K. 2002. Nutrition knowledge and food choice among black students in South Africa. *Cent Afr J Med* 48 (1/2): 4-8.

RAMAKRISHNAN, U. 1995. *UNICEF-Cornell colloquium on care and nutrition of the young child – Planning.* [WWW document – 17/10/2005]. http://www.unu.edu/unupress/food/8F164e/8F164E01.htm

RÄSÄNEN, M, NIINIKOSKI, H, KESKINEN, S, HELENIUS, H, TALVIA, S, RÖNNEMAA, T, VIIKARI, J & SIMELL, O. 2003. Parental nutrition knowledge and nutrient intake in an atherosclerosis prevention project : the impact of child-targeted nutrition counselling. *Appetite* 41 :69-77.

ROLFES, SR, PINNA, K & WHITNEY, E. 2006. *Understanding normal and clinical nutrition*. 7th edition. United States. Thomson Wadsworth.

RUEL, MT, LEVIN, CE, ARMAR-KLEMESU, M, MAXWELL, D & MORRIS, SS. 1999. *Good care practices can mitigate the negative effects of poverty and low maternal schooling on children's nutritional status: Evidence from ACCRA.* Washington, D. C. International Food Policy Research Institute.

SAYED, N. 2002. Graduate reading fundamentals of nutrition security in rural development. In Schonfeldt, H (Ed). *Nutrition security in rural communities.* Pretoria. Flemish Interuniversity Council.

SHARMA, S & NAGAR, S. 2006. Impact of educational intervention on knowledge of mothers regarding childcare and nutrition in Himachal Pradesh. *J Soc Sci* 12(2):139–142.

TERRE BLANCHE, M & DURRHEIM, K. 1999. *Research in practice. Applied methods for social sciences.* Cape Town. University of Cape Town Press.

THOMPSON, J & MANORE, M. 2005. *Nutrition: An applied approach.* San Francisco. Pearson.

UNITED NATIONS CHILDREN'S FUND (UNICEF). 2007. Progress for children. A world fit for children statistical review. Unicef.

VÄHÄTALO, L, MIKKILÄ, V & RÄSÄNEN, L. 2005. Schoolchildren's food consumption and dietary intake during the dry season in North-west Namibia. *International Journal of Food Sciences and Nutrition* 56(6):367-375.

VAN ESTERIK, P. 1995. *Factors influencing quality of care.* [WWW document – 17/10/2005]. http://www.unu.edu/unupress/food/8F164e/8F164E0f.htm

VORSTER, HH, OOSTHUIZEN, W, JERLING, JC, VELDMAN, FJ & BURGER, HM. 1997. The nutritional status of South Africans. A review of the literature from 1975-1996. Durban. Health Systems Trust.

WENHOLD, FAM, FABER, M, VAN AVERBEKE, W, OELOFSE, A, VAN JAARSVELD, P, JANSEN VAN RENSBURG, WS, VAN HEERDEN, I & SLABBERT, R. 2007. Linking smallholder agriculture and water to household food security and nutrition. *Water SA* 33(3):327-336.

ADDENDA

ADDENDUM A: QUESTIONNAIRE: NUTRITION-RELATED CARING CAPACITY

Child's Name: …… Respondent No.: ……. (100-200) V1 | | | |

Caregiver's Name: ……. Respondent No.:…. (01-99) V2 | | | |

INSTRUCTIONS:
Please indicate your details or the child's details where applicable by placing an X in the relevant block.

A1. MOTHER-CAREGIVER

This section is to be completed by the child's mother who is also a caregiver to the child and cares for the child at her home:

1. What is your age in years? V3 | | |

……..

2. What is your marital status? V4 | |

Married	1
Unmarried, not staying with a man	2
Unmarried, staying with a man	3
Divorced	4
Widowed	5
Separated	6

3. What is your highest educational level? V5 | |

No formal schooling	1

Sub A -B	2
Std. 1-5	3
Std. 6-8	4
Std. 9-10	5
Std. 10+	6

4. What is the highest educational level of the child's father? V6 ☐

No formal schooling	1
Sub A -B	2
Std. 1-5	3
Std. 6-8	4
Std. 9-10	5
Std. 10+	6
Do not know	7

5. Are you working? V7 ☐

Yes	1
No	2

6. If yes, what job do you do? V8 ☐

Domestic work at other people's home	1
Farm laborer	2
Work at a firm (private sector)	3
Cleaning services	4
Customer service (retail stores)	5
Other (specify) _____ _____	6

7. Is the child's father working? V9 ☐

Yes	1
No	2

8. If yes, what job does he do? V10 ☐

Gardening (at other people's home)	1
Farm laborer	2
Work at a firm (private sector)	3
Security officer	4
Construction work (building, painting)	5
Customer service (retail stores)	6
Other (specify) _____	7

9. What other source of income comes into the household?

Child grants	1	V11 ☐
Grandparent(s)'s pension funds	2	V12 ☐
Donations from relatives	3	V13 ☐
Other (specify) _____	4	V14 ☐

10. Who controls the household income that's allocated for child care? V15 ☐

Myself (mother)	1
Father	2
Grandparent	3
Other (specify) _____	4

11. How many children do you care for? V16 ☐

_____

12. Do you need child care facilities (e.g. crèches, pre-schools)? V17 ☐

Yes	1
No	2

13. If yes, why do you need them?

_____ V18 ☐

_____ V19 ☐

14. If no, why not?

_____ V20 ☐

_____ V21 ☐

A2. CAREGIVER OTHER THAN THE MOTHER

This section is to be completed by the child's full-time caregiver who is not the child's mother:

1. What is your age in years? V22 ☐☐

……

2. What is your highest educational level? V23 ☐

No formal schooling	1
Sub A -B	2
Std. 1-5	3
Std. 6-8	4
Std. 9-10	5
Std. 10+	6

3. How many children do you care for? V24 ☐

_____

4. What is your relationship with this child? V25 ☐

Caregiver	1
Sibling	2
Grandma	3
Aunt	4
Other (specify) _____	5

5. How long have you taken care of this child? V26 ☐☐

…… (answer in months)

6. Where do you care for the child? V27 ☐

At the child's home	1
At your own house	2
At a crèche/ pre-school	3
Other (specify) _____	4

7. How many days per week do you spend caring for the child?

…….. (days/week) V28 ☐☐

7.1 How many hours per day do you spend caring for the child?

…….(hours/day) V29 ☐☐

This section is to be completed by all types of caregivers (including the mother-caregiver)

A3. CHILD INFORMATION

Please indicate the child's details by placing an X in the relevant block.

1. What is the child's gender? V30 ☐

Male	1
Female	2

2. What is the child's age in months? V31 ☐

…… Months

Indicate the child's birthdate as follows: …… (Day/month/year)

3. What is the child's position in the household? V32 ☐

Eldest	1
In-between	2
Youngest	3
Only	4

4. What is the total number of children under 6 years in the child's household?

V33 ☐

…….. (other children excluding this child)

B. RESOURCES FOR CARE

Questions No. 1 – 6 & 10 – 13 must be completed by all types of caregivers (e.g. mother-caregiver, other caregiver at home or at a crèche).

1. Describe all your duties or responsibilities towards caring for this child.

_____ V34 ☐
_____ V35 ☐
_____ V36 ☐
_____ V37 ☐
_____ V38 ☐
_____ V39 ☐
_____ V40 ☐

2. What other responsibilities do you have in addition to caring for the child?

_____ V41 ☐
_____ V42 ☐
_____ V43 ☐
_____ V44 ☐
_____ V45 ☐

3. Do you have electricity? V46 ☐

Yes	1
No	2

4. If yes, what do you use it for?

_____ V47 ☐
_____ V48 ☐
_____ V49 ☐

5. What fuel or power source(s) do you use for cooking?

_____ V50 ☐
_____ V51 ☐
_____ V52 ☐

6. Do you use household electrical appliances that could simplify your household ☐

chores? V53

Yes	1
No	2

7. Use the table below to indicate the types of household electrical appliances that you have and use and how often do you use them.

Household electrical appliance	**How often is it used?**

V54
V55
V56
V57
V58

Questions No. 8 – 10 must be completed by all types of caregivers caring for the child at a place other than a crèche.

8. Who else looks after the child?

_____ V59
_____ V60

9. When does the person mentioned previously look after the child?

_____ V61
_____ V62

10. What does this alternative caregiver (in number 7) do for the child?

_____ V63
_____ V64
_____ V65
_____ V66

_____ V67 ☐
_____ V68 ☐

11. Describe the activities that the child does in a normal day.

_____ V69 ☐
_____ V70 ☐
_____ V71 ☐
_____ V72 ☐
_____ V73 ☐
_____ V74 ☐
_____ V75 ☐
_____ V76 ☐
_____ V77 ☐

12. What do you do if the child gets ill (e.g. diarrhea, coughs)?

_____ V78 ☐
_____ V79 ☐

C. NUTRITION KNOWLEDGE TEST

Must be completed by all types of caregivers

Please indicate your answer with an X under the column that represent the correct answer. V80 – V89

QUESTIONS	**Y**	**N**
1. Do you think that a child should eat different kinds of foods (variety) to be able to grow and develop properly?		
2. Do you think that eating fruits and vegetables will help to heal wounds?		
3. Do you think that the child should consume milk so that she can have strong bones?		
4. Do you think that dry beans can replace meat in a child's diet?		
5. Do you think that giving a child fruits and vegetables such as mangoes, yellow peaches, carrots, pumpkin, butternut and cabbage will help to improve the child's vision?		

6. Do you think that maize meal porridge is a good source of energy?		
7. Do you think that giving the child apples will help to strengthen his/her teeth?		
8. Do you think that it is good to cook vegetables in large amounts of water for a long time?		
9. Do you think that non-dairy creamers such as cremora can replace milk in the child's diet because they supply the same amounts of nutrients as milk?		
10. Do you think that the child may eat without washing hands?		

C2. MULTIPLE-CHOICE QUESTIONS: Choose one correct answer.

Indicate your answer by placing an X next to the correct answer.

1. Which of the following foods is the best source of energy? V90 ☐
   a. eggs
   b. potatoes
   c. apples
   d. maize meal porridge
   e. fresh milk
2. In order for the child to strengthen bones and teeth, she/he should eat… V91 ☐
   a. chicken livers
   b. brown bread
   c. milk
   d. apple
   e. cabbage
3. The following food is the best source of protein, which is required for the growth and maintenance of body tissues. V92 ☐
   a. maize meal
   b. orange
   c. eggs
4. What food is essential to maintain healthy eyes and good vision? V93 ☐
   a. apple
   b. carrot
   c. beetroot
   d. potatoes
5. What kinds of food will you choose for a child for a snack in the morning? V94 ☐

a. orange
b. cheese curls
c. sweets
d. jam sandwich

6. The development of holes in teeth (tooth decay) is associated with …. V95 ☐
   a. drinking too much cold drinks
   b. the eating of sweets (e.g. lollipops, Cadbury éclairs, marshmallows etc.)
   c. consumption of white sugar added to food
7. What kind of oil or fat will you use to fry vegetables? V96 ☐
   a. sunflower oil
   b. butter
   c. lard
   d. margarine in a tub
8. What kind of beverage is the best to give when a child is thirsty? V97 ☐
   a. cola (coke)
   b. concentrated cold drinks (oros, bibo, sweeto)
   c. water
   d. tea with sugar and creamer
9. Which of the following vegetables may be your first choice to buy and prepare for the child? V98 ☐
   a. frozen carrots
   b. fresh carrots
   c. tinned/ canned carrots
10. Which of the following food preparation methods should have preference when preparing healthy foods? V99 ☐
    a. frying in fat or oil
    b. grilling in the oven, and/ or baking
    c. boiling
    d. steaming

C3. OPEN-ENDED QUESTIONS:

1. What types of food are good for the child's optimal growth and development?
   …… V100 ☐☐

…… V101

…… V102

2. Do you have a refrigerator? V103

Yes	1
No	2

2.1 If yes, what kinds of food do you store in it?

Dairy: …….. V104

Meat: …….. V105

Vegetables: …….. V106

Fruit: …….. V107

Beverages: …… V108

3. Do you think that it is important that the child eat meat? V109

Yes	1
No	2

3.1 If yes, how often should a child eat meat in a week? V110

……..

……

3.2 If yes, give reasons to explain why a child should eat meat?

…….. V111

…….. V112

…….. V113

3.3 If no, what do you give the child instead of meat?

…….. V114

…….. V115

…….. V116

4. Do you think that it is important that the child consume milk? V117

Yes	1
No	2

4.1 If yes, how often should a child consume milk in a week? V118

……

……

4.2 If yes, give reasons to explain why a child should consume milk.

…… V119 ☐

…… V120 ☐

…… V121 ☐

4.3 If no, what do you give to the child to drink instead of milk?

…….. V122 ☐

…….. V123 ☐

…….. V124 ☐

5. Do you think that it is important that the child eat porridge? V125 ☐

Yes	1
No	2

5.1 If yes, how often should a child eat porridge in a week? V126 ☐

……

……

5.2 If yes, give reasons to explain why a child should eat porridge.

…… V127 ☐

…… V128 ☐

…… V129 ☐

5.3 If no, what do you give the child to eat instead of porridge?

…… V130 ☐

…… V131 ☐

…… V132 ☐

6. What kinds of snacks do you give to the child to eat?

…….. V133 ☐

…….. V134 ☐

…….. V135 ☐

7. What food preparation method do you use to prepare food for children aged 3 to 5 years? Explain.

…… V136 ☐

…… V137 ☐

☐

…… V138

8. What is added to the food while the food is being cooked?

Cooking oil	1	V139 ☐
Salt	2	V140 ☐
Spices	3	V141 ☐
Herbs	4	V142 ☐
Margarine	5	V143 ☐
Other (specify)……..	6	V144 ☐

9. Use the table below to indicate how and where and you store the types of foods listed below.

Type of food	**How and where do you store it**	
Mealie meal		V145 ☐
Bread		V146 ☐
Vegetables		V147 ☐
Cooked foods		V148 ☐
Other (state) ……		V149 ☐

10. If you had a lot of money and had access to any/ all kinds of foods, answer the following questions:

10.1 If you have to prepare a healthy breakfast for a child, what kinds of food will you give to the child?

…… V150 ☐
…… V151 ☐
…… V152 ☐

10.2 If you have to prepare a healthy lunch for a child, what kinds of food will you give to the child?

…… V153 ☐
…… V154 ☐
…… V155 ☐

10.3 If you have to prepare a healthy dinner for a child, what kinds of food will you give to the child?

…… V156 ☐

…… V157 ☐
…… V158 ☐

10.4 If you have to give a child healthy snacks, what kinds of food will you give?

…….. V159 ☐
…….. V160 ☐
…….. V161 ☐

D. CARING ACTIVITIES

D1. QUESTIONNAIRE

1. Who supervises the child during meal times to ensure that he/she is eating?

…….. V162 ☐
…….. V163 ☐

2. With whom does the child usually eat? V164 ☐

Alone	1
Sibling	2
Other (specify) ……..	3

3. Describe the environment in which the child usually eats.

…… V165 ☐
…… V166 ☐
…… V167 ☐
…… V168 ☐

D2. 24 HOUR RECALL: This section is to be filled by anyone who feeds the child regularly.

1. Tick what day was yesterday. V169 ☐

Sunday	1	Monday	2	Tuesday	3	Wednesday	4	Thursday	5	Friday	6	Saturday	7

2. Would you describe the food that the child ate yesterday as typical of his/her habitual food intake? V170 ☐

Yes	1
No	2

3. I want to find out about everything the child ate and drank yesterday, including water or food you pick from the bush. Please tell me everything the child ate from the time he/she woke up till the time he/she went to sleep. Please also tell me where (actual place) the child ate the food and how much.

DESCRIPTION OF FOOD AND PREPARATION METHOD	AMOUNT	GRAMS	CODE
EARLY MORNING TIME:			
BREAKFAST TIME:			
MIDMORNING (between breakfast and lunch) TIME:			
LUNCH TIME:			
MIDAFTERNOON (between lunch and supper) TIME:			

SUPPER TIME:			
LATE NIGHT (after supper) TIME:			

4. Is the child's eating pattern different on weekends? V171 ☐

Yes	1
No	2

If yes, please describe

THANK YOU FOR YOUR COOPERATION!

ADDENDUM B: CONSENT FORM

AN INVESTIGATION INTO THE CAPACITY OF CAREGIVERS TO PROVIDE NUTRITION-RELATED CARE TO PRE-SCHOOL-AGE CHILDREN

The above mentioned study will be conducted by Cate Molotja, a Masters student in Consumer Science who is currently studying at the University of Pretoria. This study aims to investigate the caring capacity of caregivers of pre-school age children (aged three to five years) in a poor peri-urban community in order to formulate community-based guidelines or strategies that may contribute to improved household food security for all age groups, but particularly for the children in such communities. Pre-school-age children have high nutrient needs because they are more physically active, but their playing can sometimes interfere with eating adequate food. Therefore, it is important that caregivers, who make all food choices for the preschool-age-child during this vital period of growth and development, ensure that they consume the required amounts of nutrients from foods so that they can grow and develop properly.

I (name) …… hereby give my permission to participate in the study.

I understand that

- My participation is voluntary, if I choose not to participate or to withdraw from the study at anytime, there will be no penalty.
- The questionnaire will be administered to me by an interviewer in my native language.
- The questions will be asked once.
- The amount of time to finish answering the questionnaire will be 1 ½ hours.
- Answers given by myself will be kept confidential to research staff and my identity will remain anonymous in the analysis of the study.
- The results of the study will be published and my name will not be used.

My participation in the study will generate information that will help in improving the quality of life of the pre-school children.

Signature (participant)……..
Date…...……

Signature (researcher)……..
Date……