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Professional nurses' perceptions of their ability to  
render effective nutritional care and support to people  
living with HIV/AIDS

**Daisy Chasauka**  
**(B.Sc. Nutrition)**

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**Supervisor: Prof. J.C. Jerling**

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## ACKNOWLEDGEMENTS

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God Almighty, who remembered me and brought me to South Africa for my studies, He is the One who says in Jeremiah 33: 3,

*Call unto me  
And I will answer thee  
And shew thee great and mighty things  
Which thou knowest not.*

My family in Zimbabwe for their continuous prayers which kept me focused and made me stronger day by day.

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**Abstract**

**Objective:** A neglected issue in literature on nutrition and HIV/AIDS is how other health professionals view their role in that area. The purpose of this study was to understand professional nurses' perception regarding their ability to render effective nutritional care to people living with HIV/AIDS (PLWHA).

**Design:** A qualitative approach was used. Twenty-three, in-depth, semi-structured interviews were conducted with nurses (mean age 38) working in eight (five rural and three urban) Wellness clinics within public hospitals providing antiretroviral therapy (ART) in North West Province, South Africa. Brief structured demographic questionnaires were also administered. All interviews and focus group discussions were recorded for transcription and open-coding. NVivo was used for open coding, whilst descriptive statistics were done using SPSS for windows (version 14, SPSS Inc., Chicago, IL). A research team of professionals and researchers collaboratively analysed data for emerging themes.

**Results:** All the hospitals that participated had at most three nurses, having at least one professional nurse working in the Wellness clinic for PLWHA. More than half of the participants interviewed were diploma holders, eight (35%) were degree holders and three (13%) had certificates in nursing. Five main themes (previously guided by the interview questions) emerged during the analysis of data and these portrayed participants' perceptions regarding their ability to render effective nutritional care to PLWHA. The themes were 1) *challenges faced by nurses dealing with PLWHA on a daily basis*, 2) *concerns of PLWHA*, 3) *nurses' perception on the importance of nutrition in HIV/AIDS care* 4) *nurses' perceived ability to deal with nutritional issues in HIV/AIDS*, 5) *the role of traditional healers, traditional medicine in HIV/AIDS*. Thirty five percent of participants mentioned poor socio-economic status of PLWHA as a barrier to the participants to talk about good nutrition to people that are food insecure. Furthermore, 13% of participants indicated that they are constantly facing the dilemma of PLWHA mixing traditional medicines and ART. Participants perceived the following skills to be important in the area of nutrition and HIV/AIDS: *communication, listening and knowledge*. Although knowledge could be debated as it is not a skill per se, the participants believed that one needs to acquire nutrition knowledge first and then improve

on the communication and listening skills with more exposure and training. Ten (44%) of the participants interviewed rated themselves as average, 11 (48%) participants as good whilst only 4%, representing one participant, felt they were very good at giving out nutrition education. Sixty one percent of participants said they would require more knowledge, whilst 39% said they would need to acquire communication and listening skills for them to be able to render effective nutritional care to PLWHA. In this study, participants perceived nutritional care to PLWHA as their responsibility and that lack of knowledge was influencing their inability to offer this service effectively. All the participants indicated a need for collaboration with nutrition professionals, in-service training as well as exposure to clear communication channels for nutrition and HIV/AIDS information. Participants were concerned with the lack of policy implementation regarding nutrition and policy documents. Of the 23 participants interviewed, only two (9%) confirmed having seen and read the South African Guidelines on Nutritional Care for People Living with TB, HIV/AIDS and other Chronic Debilitating Conditions.

**Conclusion:** All participants interviewed believed that nutrition knowledge in the area of HIV/AIDS can be improved if poor people who are infected and affected by HIV/AIDS are food secure. Concerning practice, it is recommended that nutrition and HIV/AIDS as a topic be introduced in both undergraduate and postgraduate training for nurses. The lack of policy implementation, level of qualification and years spent in the nursing profession may have influenced participants' perception regarding their ability, as well as confidence, to render nutritional care to PLWHA. Possible interventions to improve policy implementation could be the development of user-friendly information, education and communication materials for health institutions as these may serve as constant reminders to health care service providers. It was found that participants' perceptions regarding their ability to render effective nutritional care to PLWHA was affected by a complex number of factors which emerged as themes that need to be addressed. Participants' experience suggests that more research and inquiries are needed into traditional medicines and traditional healing, as the issue of ARVs and traditional medicine is becoming a public health dilemma, not only to the nurses, but to every stakeholder involved in the field of HIV/AIDS. Furthermore, a need exists for nurse-specific outreach, collaboratively done by nutrition professionals and other stakeholders.

This work thus provides a foundation for further exploring ways to improve the ability of other health care workers such as nurses in the nutritional care of PLWHA which will ultimately improve the quality of life of PLWHA.

**Keywords [MeSH]:** HIV infections, nutrition, acquired immunodeficiency syndrome, perceptions, nurses, qualitative research

**AUTHORS' CONTRIBUTION**

This study has been planned and carried out by two researchers from the Department of Nutrition and Consumer Sciences at the Potchefstroom Campus of the North West University. Each researcher's contribution is listed in the table below.

Ms. D. Chasauka	M.Sc. student, responsible for: <ul style="list-style-type: none"> <li>• proposal writing and ethical approval</li> <li>• gaining access to hospitals</li> <li>• conducting pilot study</li> <li>• volunteer work</li> <li>• interviewing/data collection</li> <li>• transcribing</li> <li>• coding, analysis and interpretation of results</li> <li>• writing the text</li> </ul>
Prof. Johann C. Jerling (Ph.D Nutrition)	Promoter, supervisor and critical reviewer of the study

The following statement is a declaration by the co-authors to confirm their role in the study and agree to its nature of being in a dissertation.

***A declaration:***

I hereby declare that I have approved this dissertation and that my role in this study and that of Ms. D. Chasauka complies with what is described above.

\_\_\_\_\_  
Prof. Johann C. Jerling

\_\_\_\_\_  
D. Chasauka

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## CHAPTER 1

INTRODUCTION

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*Like a pebble dropped in a pool, HIV sends ripples to the edges of society, affecting first the family, then the community, then the nation as a whole (Anon <a>, 2006)*

**1.1 Problem statement**

When Acquired Immune Deficiency Syndrome (AIDS) emerged from the shadows two decades ago, few people could predict how the epidemic would evolve, and fewer still could describe with any certainty the best ways to combat it. Now, at the start of a new millennium, we are past the stage of conjecture. We know from experience that AIDS can devastate whole regions, knock decades off national development, widen the gulf between rich and poor nations and push already-stigmatised groups closer to the margins of society. Just as clearly, experience shows that the right approaches, applied quickly enough with courage and resolve, can and do result in lower HIV infection rates and less suffering for those affected by the epidemic (Anon <b>, 2002).

South Africa has a population of 40 million people, of which 5.1 million people are living with HIV/AIDS (PLWHA) (Table 1.1). The importance of good nutrition in the prevention of and coping with HIV/ AIDS is well recognised (Allard *et al.*, 1998; Butensky, 2001; Gasparis & Tassiopoulos, 2001; Gil *et al.*, 2005; Piwoz & Preble, 2000). HIV-infected people who suffer from hunger and or malnutrition are more vulnerable to opportunistic infections and they are less likely to recover from them. This eventually renders the infected person to be unproductive, less likely to earn income or to produce food, which can lead to nutritional deficits for both the HIV-infected and for their dependants (Anon <c>, 2003).

Although printed information on nutrition as related to HIV/AIDS is readily available, studies on perception may help health professionals to formulate effective objectives for health programmes and also develop relevant techniques for health education.

**Table 1.1:** HIV/AIDS estimates for Sub-Saharan Africa December 2004  
(Anon <sup>d</sup>, 2004)

Country	Adults	Adult Rate (%)	Women	Children	AIDS deaths among adults and children	Orphans due to AIDS deaths
Swaziland	200,000	38,8	110,000	16,000	17,000	65,000
Botswana	330,000	37,3	190,000	25,000	33,000	120,000
Lesotho	300,000	28,9	170,000	22,000	29,000	100,000
Zimbabwe	1,600,000	24,6	930,000	120,000	170,000	980,000
South Africa	5,100,000	21,5	2,900,000	230,000	370,000	1,100,000

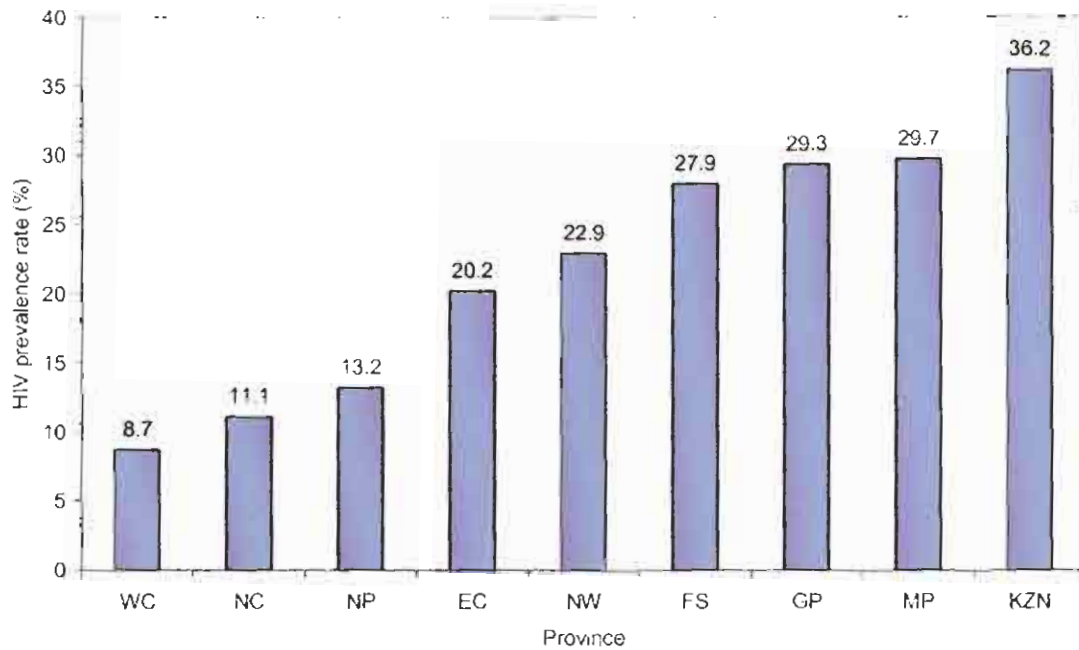
The nursing profession represents more than 50% of the total professional human resources of health services in South Africa (Van Rensburg, 2004:335). According to verbal communications with Mr. A. Rasekhala (2006), a member of the South African Professional Board for Dietetics, there is less than 2,000 dietitians to date registered with the Health Professions Council of South Africa and unfortunately the number of nutritionists is unknown as the register is in the process of being compiled. Hence it is reasonable to expect that the nursing profession has greater contact with the public on a daily basis and is possibly an important route of passing vital nutrition information.

## 1.2 HIV/AIDS prevalence rates in North West Province

The antenatal survey of pregnant women was used to estimate the national HIV prevalence for the whole population of South Africa in 2000. Pregnant women were selected as they are easily accessible especially when they come to hospitals/clinics for



routine medical check-up. In addition, they are sexually active and more likely than other groups to be representative of the general population (Ntsaluba, 2000). Figure 1.1 shows the HIV prevalence estimated by province, and North West province had a 22.9% HIV prevalence rate.



**Figure 1.1:** HIV prevalence rates by province (Ntsaluba, 2000)

(WC: Western Cape; NC: Northern Cape; NP: Northern Province; EC: Eastern Cape; NW: North West; FS: Free State; GP: Gauteng Province; MP: Mpumalanga Province; KZN: KwaZulu Natal)

As observed in Figure 1.1, HIV infections are clearly seen across the nine provinces despite differing geographical variations. In this particular study North West province was purposefully selected mainly because of logistical considerations such as the geographical location of the researcher’s institution to the hospitals. In addition to complement other HIV/AIDS research such as the THUSA study (Oosthuizen *et al.*, 2006) which had been done in the province by the North West University’s Department of Nutrition (Potchefstroom Campus).

### 1.3 Aim of the study

The main aim of this study was to understand and describe the perceptions of professional nurses working with PLWHA in hospitals regarding their ability to render effective nutritional care to PLWHA.

The specific objectives were as follows:

- x To explore and describe the perceptions of professional nurses pertaining their ability and confidence in rendering effective nutritional care and support to PLWHA.

The proposed outcomes were:

- x better understanding of nurses' insight on nutrition and HIV/AIDS issues and,
- x nurses' sense of empowerment to deal with HIV-related nutrition issues.

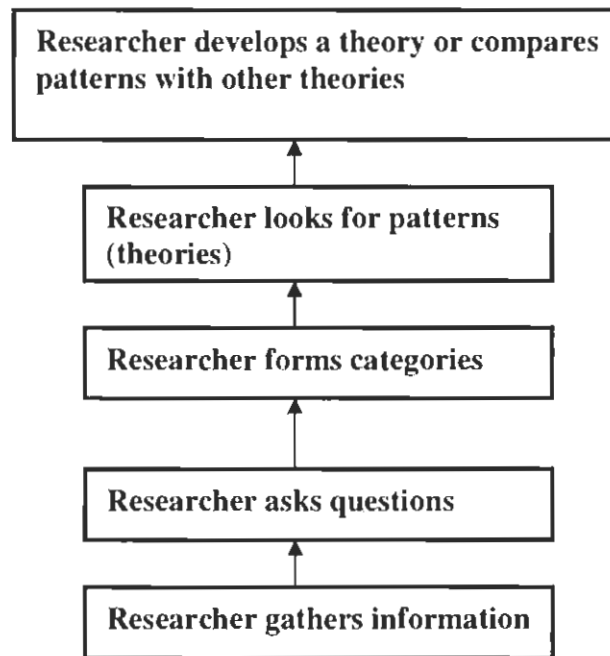
The proposed applications of results were to:

- x recommend continued professional development of nurses on nutrition and HIV/AIDS (e.g. further training of nurses has a ripple effect on the society as a whole),
- x inform policymakers about the situation on the ground e.g. South African Department of Health and,
- x ensure a consistent and coordinated dissemination of nutrition education messages to professional nurses.

### 1.4 Overall paradigm and the qualitative approach

The qualitative paradigm which has been termed the constructivist approach or naturalistic or the interpretative approach was used (Creswell, 1994:4). This is an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting (Creswell, 1994:2). Qualitative design was particularly selected for this study as it focuses on gaining more detailed information from a smaller sample group (Denzin & Lincoln, 1994:1). Consequently, this method was used to generate information that is not easily quantifiable, such as changes in perceptions (Anon <j>, 2006). Tools normally used include interviews, focus groups and case studies. The information gathered is richer and more detailed than that gained from quantitative

research (Denzin & Lincoln, 1994:4-6). In addition the information has the added benefit of allowing the researcher to place people's experiences in context. Creswell's (1994:96) inductive model of thinking or logic (Figure 1.2) was adopted and modified for this study.



**Figure 1.2:** The inductive mode of research in a qualitative study (Creswell, 1994:96)

On a personal level, this type of approach enabled the researcher to gain a better insight and an appreciation of the life experiences of professional nurses dealing with HIV/AIDS on a daily basis in South Africa.

### **1.5 Theoretical assumptions**

The theoretical assumptions of the research were centred on the theoretical definitions of key concepts applicable to this research.

#### ***1.5.1 Theoretical definitions***

The following definitions outlined the key concepts applicable to this study:

➤ **Professional nurse**

A professional nurse is one that has undergone training under various disciplines regulated and licensed by the South African Nursing Council (SANC) according to Section 16 of the Nursing Act 50/1978, as amended and obtained varying qualifications in:

- ⇒ General Nursing
- ⇒ Midwifery
- ⇒ Community Nursing
- ⇒ Psychiatric Nursing
- ⇒ Nursing (General, Psychiatry and Community) and Midwifery
- ⇒ Clinical Nursing Science, Health Assessment, Treatment and Care.

#### ➤ **Nursing**

Nursing is a discipline focused on assisting individuals, families and communities in attaining, re-attaining and maintaining optimal health and functioning (Anon <e>, 2006). In this research the focus is on nursing skills required by a professional nurse in rendering effective nutritional care for PLWHA.

#### ➤ **Skill**

Skill is an ability that has been acquired by training and it is also the talent to do something (Anon <f>, 2006).

In this research, skills are learned activities by professional nurses working in HIV/AIDS care.

#### ➤ **Perception**

Perception is the process of acquiring, interpreting, selecting and organizing sensory information (Anon <g>, 2006). It is also an act of being aware of the world, of people and events (Corsini & Auerbach, 1996:660).

### **1.6 Organisation of the dissertation**

The preface and acknowledgements marked the beginning of the dissertation. An abstract in English and Afrikaans is given, followed by a list of tables, figures, abbreviations and table of contents. This was then followed by Chapter 1 which acted as the introduction and included the problem statement as well as aims of the study. The rest of the chapters are outlined as follows:

- Chapter 2: Gives a review of literature in relation to HIV/AIDS and nutrition. It also covers South Africa's nursing structure.
- Chapter 3: Describes the research methodology.
- Chapter 4: An outline of results and discussion thereof.
- Chapter 5: Acts as a closing chapter, in which a summary of the most important aspects of the study including shortcomings and recommendations are given.

All letters of authorisation and questionnaires used during the study are attached as Appendices. The references used for all the chapters are listed at the end of the dissertation (as bibliography), according to the guidelines of the North West University.

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**CHAPTER 2****LITERATURE STUDY**

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*“The voice of nutrition needs to be heard loudly and clearly in the HIV/AIDS community, where innovative partnerships can serve to move the agenda forward”, (Dr. Peter Piot, UNAIDS, 2004).*

**2.1 Introduction**

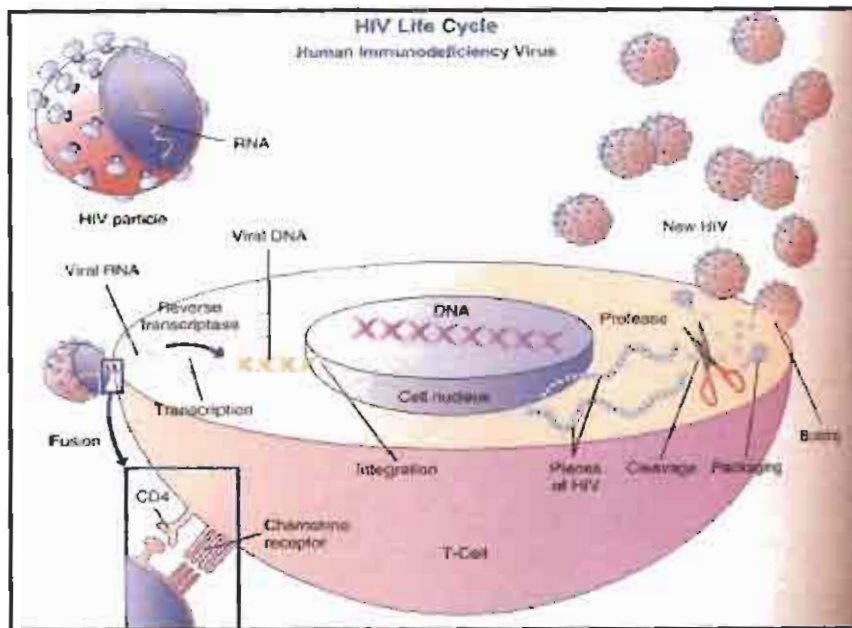
The previous chapter dealt with the motivation and problem statement which led to the research aims and objectives of the study and in brief the main reasons for selecting the qualitative approach. This chapter illustrates a review of literature from 1998 to 2005 on nutrition and HIV/AIDS specifically looking at the role of micronutrients in HIV disease progression in detail. Included is an insight into the role of macronutrients and in brief the relationship between antiretroviral drugs and nutrition. The basis for concentrating mostly on micronutrients for this particular literature review is that HIV/AIDS and nutrition is a very broad topic hence the need for focusing on a certain aspect which is pertinent in that area. In addition, micronutrient deficiencies as well as interventions to increase micronutrient intake may be determinants of susceptibility to HIV infection, transmission and progression, including risk of opportunistic and other infections. Accordingly the literature review consists of observational studies as well studies from randomised controlled trials (RCTs). For the reason that observational studies may provide information about dose-response relationships that can not be obtained from a RCT, on the other hand observational studies alone can not provide the evidence on which recommendations should be based. Included are highlights of the global prevalence of the HIV epidemic as well as a summary of nutrition and HIV/AIDS policies produced by the South African department of Health and other relevant international non-governmental agencies.

*Keywords: MeSH terms: HIV infection, AIDS, nutrition, malnutrition, micronutrients, oxidative stress, macronutrients, protein deficiency, energy deficiency*

## 2.2 HIV infection and AIDS

HIV is an acronym for Human Immunodeficiency Virus, the aetiologic agent of AIDS (Holden, 2003:4). There are two types of HIV: HIV-1 and HIV-2 (Jackson, 2002:41). HIV-1 is responsible for the vast majority of AIDS in the United States of America (USA) and most parts in Sub-Saharan Africa (Jackson, 2002:42). HIV-2, seen more often in western Africa, has a slower course than HIV-1 (Holden, 2003:12). There are many strains of both types and the virus mutates rapidly, a trait that has made it especially difficult for researchers to find an effective treatment or vaccine (Jackson, 2002:42). Most people have HIV-1, and unless specified, HIV-1 generally is the type to which discussions refer. This literature review will also be referring to HIV-1.

HIV is especially lethal because it attacks the immune system cells (variously called T4, CD4, or T-helper lymphocytes) that would ordinarily fight off such a viral infection (Jackson, 2002:42-43). CD4 in particular means cluster of differentiation and it is also a primary receptor used by HIV-1 to gain entry into host T cells. The CD4 positive (CD4+) T-lymphocyte coordinates a number of important immunologic functions, and a loss of these functions result in progressive impairment of the immune response (Mahan & Stump, 2004:1033-1034). Receptors on these cells appear to enable the viral ribonucleic acid (RNA) to enter the cell (Figure 2.1). Hence the CD4 cell is the target for HIV and is now programmed to be an 'HIV factory'. As with all retroviruses, once the RNA is inside the cell, an enzyme called reverse transcriptase allows it to act as the template for its own RNA to deoxyribonucleic acid (DNA) transcription. The resultant viral DNA inserts itself into the cell's DNA and is reproduced along with the cell and its daughters (Figure 2.1). The viral protease enzyme is responsible for cutting the long viral protein chains into the necessary pieces to produce more HIV. The viral cells then invade other immune system cells and the cycle is repeated. Without treatment, HIV replicates and produces about 800 billion virus particles a day. CD4 cells replicate 100 million times a day (Mahan & Stump, 2004:1034).



**Figure 2.1:** HIV life cycle (*Mahan & Stump, 2004: 1030*)

The Center of Disease Control (2005) defines AIDS as a condition whereby there is:

- HIV seropositivity,
- weight loss greater than 10 percent over 2 months,
- a CD4+ count of less than 200 T-lymphocytes/ $\mu$ L or a CD4-positive T-lymphocyte percentage of total lymphocytes of less than 14 percent and/or,
- 3 clinical conditions i.e. pulmonary tuberculosis, recurrent pneumonia and cervical cancer.

According to Holden (2003:4), progression from HIV infection to AIDS is commonly thought of in terms of four stages outlined below.

### Stage 1: Acute Phase

In the first stage, when someone is infected with HIV, the body produces antibodies to fight the infection (seroconversion). After a 'window period' lasting from three weeks to three months (depending on the test used), the presence of these antibodies to HIV can be detected by a test which, if positive, indicates that the person has HIV. Hence, people

who are infected with HIV are often referred to as being 'HIV-infected'. Individuals are particularly infectious during this stage, and often have an illness resembling influenza.

### **Stage 2: Asymptomatic Period**

Following the initial HIV infection, there is a second stage: an 'asymptomatic' period, with no visible signs of the presence of HIV, except swollen glands. However, the HIV in someone's body is in the process of attacking and destroying the immune system. This weakens the system, and creates an opportunity for the body to be attacked by various infections. This process leads to the third stage known as the symptomatic stage.

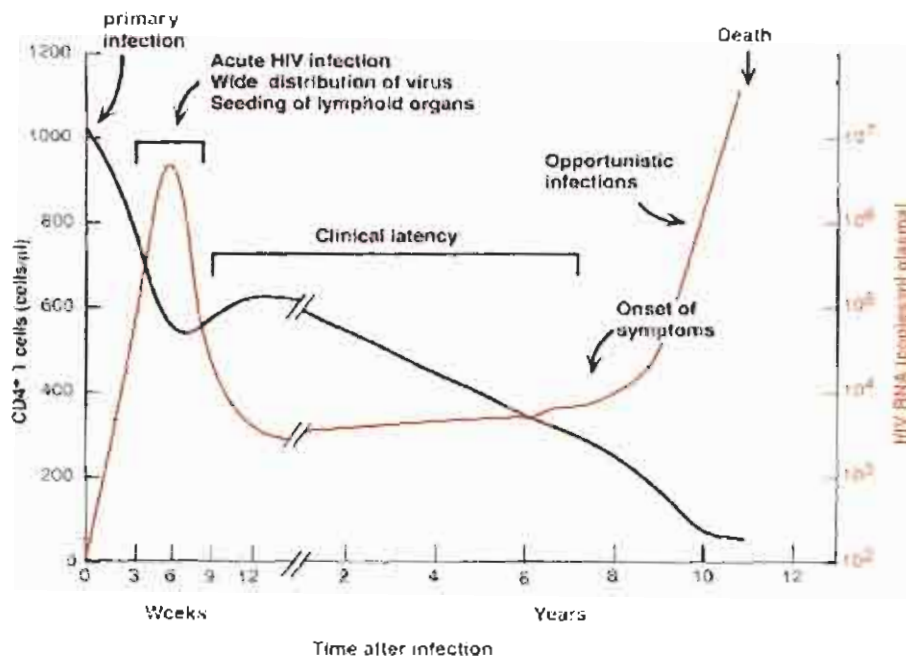
### **Stage 3: Symptomatic Period**

At this stage an individual starts to show visible signs and symptoms of opportunistic infections. Many of the opportunistic infections are rarely seen in people with normal immune systems; if it does occur, it does not cause much harm. For someone with HIV, however, these opportunistic infections may be severe. It includes parasitic, bacterial, viral, and fungal infections and malignancies, and commonly results in diseases such as tuberculosis, thrush, shingles, meningitis, pneumonia and certain cancers such as Kaposi's sarcoma, cervical cancer, and cancers of the immune system. Other symptoms of HIV infection include lack of energy, weight loss, and loss of short-term memory.

However, when the 'symptomatic period' of HIV infection is severe, the person is said to have AIDS.

### **Stage 4: AIDS**

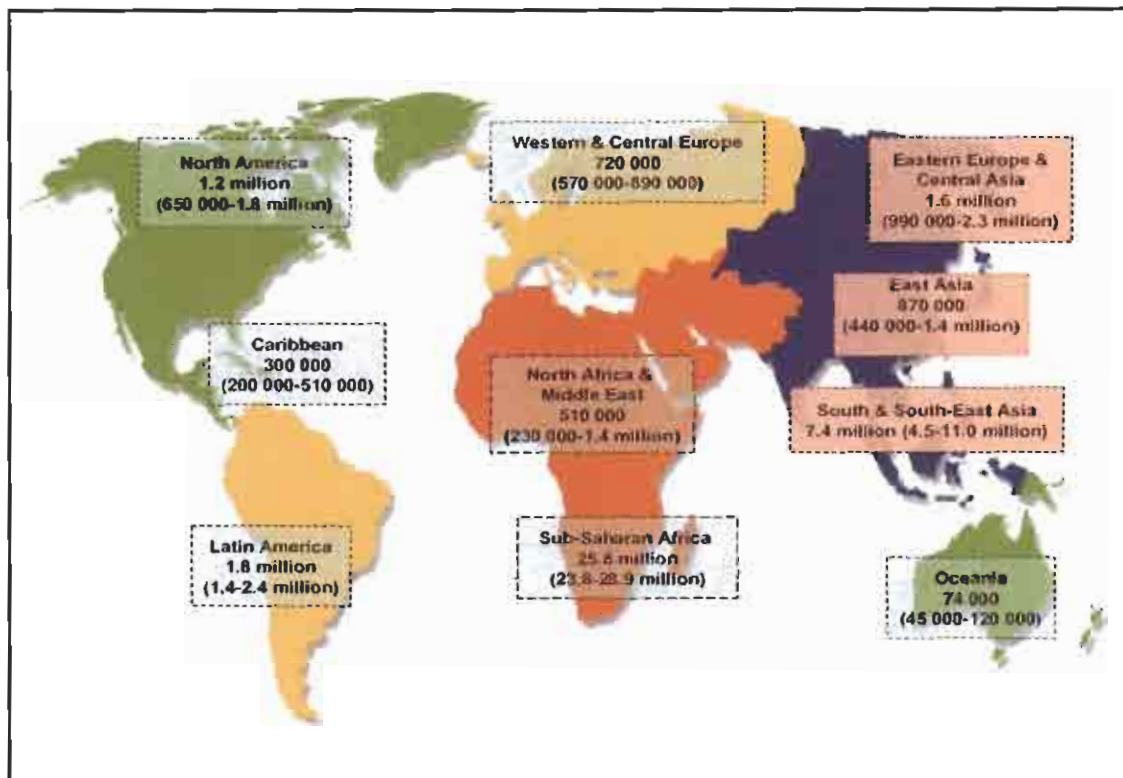
This is the final stage of HIV infection which ultimately leads to death (Figure 2.2). It may be diagnosed by tests of HIV antibodies in the blood, or clinically.



**Figure 2.2:** Natural history of HIV infection in an average patient without antiretroviral therapy from time of transmission to death (*Mahan & Stump, 2004:1034*)

### 2.3 Global HIV/AIDS prevalence rates

Although HIV/AIDS has now been identified in nearly all countries, the prevalence or scale of infection varies widely both between and within countries. Figure 2.3 shows the latest statistics on the world epidemic of HIV/AIDS as published by UNAIDS/WHO in December 2004.



**Figure 2.3:** Estimated number of adults and children living with HIV in 2005

[Total = 40.3 (36.7-45.3) million (UNAIDS/WHO, 2005)]

In some countries, particularly those in sub-Saharan Africa, the HIV epidemic is reversing all the developmental gains made before, hence making the attainment of the Millennium Development Goals (MDGs) a huge challenge (FAO, 2005:1-3). Goal six refers specifically to AIDS and it has been mentioned here as the HIV epidemic is hindering the attainment of several other goals shown in Figure 2.4.

- Goal 1:** Eradicate extreme hunger and poverty
- Goal 2:** Achieve universal primary education
- Goal 3:** Promote gender equality and empower women
- Goal 4:** Reduce child mortality
- Goal 5:** Improve maternal health
- Goal 6:** Combat HIV/AIDS, malaria and other diseases
- Goal 7:** Ensure environmental sustainability
- Goal 8:** Develop a global partnership for development

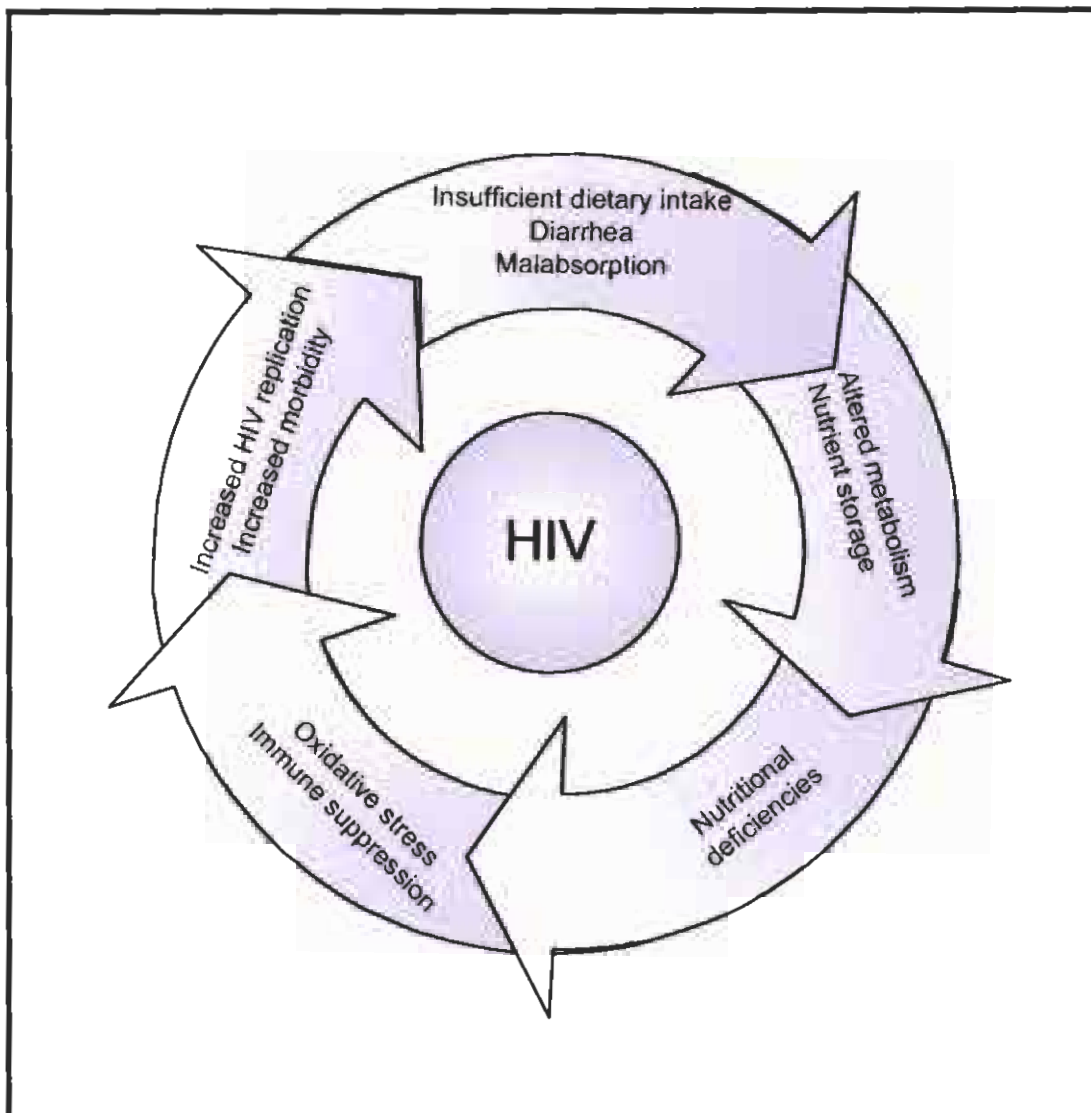
**Figure 2.4:** Millennium Development Goals (FAO, 2005:1)

## 2.4 Relationship between nutrition and HIV/AIDS

Malnutrition and food insecurity are endemic in Sub-Saharan Africa, where more than 23 million people are living with HIV/AIDS and with more than 2 million AIDS-related deaths in 2004 (UNAIDS, 2004). At the family level, illness and death from AIDS have profoundly affected family well-being, including caregivers' ability to ensure adequate food and nutrition for the family.

The importance of good nutrition in the prevention of and coping with HIV/AIDS is well recognised. HIV-infected people who suffer from hunger and/or malnutrition are more vulnerable to opportunistic infections and are less likely to recover from them (Figure 2.5). This eventually renders the infected person to be unproductive, less likely to earn income or to produce food, which can lead to nutritional deficits for both the HIV-infected and for their dependants (FAO, 2003).

Micronutrient deficiency is often common during HIV infection. Insufficient dietary intake, malabsorption, altered metabolism and increased nutrient requirements contribute to the development of micronutrient deficiency (Allard *et al.*, 1998; Butensky, 2001; Gasparis & Tassiopoulos, 2001; Gil *et al.*, 2005; Piwoz & Preble, 2000). Sepulveda and Watson (2002) state that adequate nourishment is critical for HIV-infected individuals as micronutrient deficiency accentuates immunodeficiency and lowers host defenses, leaving the host susceptible to a wide range of opportunistic infections.



**Figure 2.5:** Vicious cycle of micronutrient deficiencies and HIV pathogenesis (adapted from Piwoz & Preble, 2000:9).

Two theories have formed the basis that micronutrient deficiencies play a role in the pathogenesis of HIV/AIDS and they are oxidative stress (FANTA, 2001; Gil *et al.*, 2005) and nutritional immunology (Evans & Halliwell, 2001; Fawzi *et al.*, 2004 and 2003; Jiamton *et al.*, 2003; Lettow *et al.*, 2003).

### **2.4.1 Oxidative stress**

Oxidative stress in biological systems is caused by a relative overload of oxidants, i.e., reactive oxygen species (Pace & Leaf, 1995:523). Sustained oxidative stress disrupts cellular structures and functions, which are maintained and mediated by critical oxidation-reduction (redox) pathways. The resulting damage to cells and tissues contributes to the pathophysiology of many diseases including viral replication, inflammatory response, decreased immune cell proliferation, loss of immune function, apoptosis, chronic weight loss, and increased sensitivity to drug toxicities which are characteristic of increased HIV progression to AIDS. Elevated serum levels of hydroperoxides and malondialdehyde also have been noted and are indicative of oxidative stress during HIV infection (Pace & Leaf, 1995:523).

### **2.4.2 Nutritional immunology**

The impaired immune functions resulting from lack of essential micronutrients have been called nutritionally acquired immune deficiency syndrome, or NAIDS (Beisel, 2001:23-42). NAIDS may contribute to the depletion and dysfunction of CD4-positive cells but also makes the host susceptible to other infections which may increase viral replication and hence quicken HIV progression (Piwoz & Preble, 2000:8-9).

## **2.5 Role of macronutrients in HIV disease progression**

Severe or chronic infections such as tuberculosis (TB), HIV and AIDS cause children and adults to lose weight. At the start of the epidemic in Africa, AIDS was commonly known as the “slim disease” as so many people with AIDS had severe wasting and muscle loss (Piwoz & Preble, 2000:9). This section will look at the effects of HIV/AIDS on the three key factors that contribute to malnutrition in PLWHA in line with the vicious cycle of infection and malnutrition alluded to in Figure 2.5 and they are:

- ⌘ intake
- ⌘ absorption and,
- ⌘ metabolism,

In addition the effect of HIV/AIDS on energy and protein requirements will be included.

### 2.5.1 Changes in intake

PLWHA often eat less mostly because of a loss in appetite (Macallan *et al.*, 1995; Piwoz & Preble, 2000:11). This may be due to opportunistic infections that cause the malaise, fever and nausea (Macallan, 1999). Apart from changes in the mental state and other psychosocial factors, HIV/AIDS redirects resources away from food to care (Anon «c», 2004). In some settings, people may have to choose between paying for medicine and paying for food. At the household level, the loss of a breadwinner to AIDS impacts negatively in the family's stable supply and access to food (Mensah & Tomkins, 2003:125).

Reductions in dietary intake leads to growth failure in HIV-positive children (Arpadi *et al.*, 2000) and wasting in HIV-positive adults (Macallan, 1999). Systemic infections such as TB and intestinal infections including *Cryptosporidium* and oesophageal candidiasis also contribute to reductions in dietary intake (Amadi *et al.*, 2001). Therefore, opportunistic infections need to be treated first and foremost as it is a challenge to encourage children or adults who are HIV-positive to eat (Amadi *et al.*, 2001 & 2002).

### 2.5.2 Changes in absorption

Malabsorption of fats and carbohydrates is common at all stages of HIV infection (Figure 2.2) in adults as a result of increased intestinal permeability and other intestinal defects (Amadi *et al.*, 2001). On the other hand, the virus has been shown to damage the intestinal villi, and inflammation can damage gut tissue and reduce absorption (Amadi *et al.*, 2001). A study by Semba and Tang (1999) reported that people with HIV have high levels of faecal fat that is unrelated to fat intake. Fat malabsorption, in turn affects the absorption and utilisation of fat-soluble vitamins such as vitamins A and E, thus further compromising nutrition and immune status (Piwoz & Preble, 2000:11).

Studies by Canani *et al.* (1999) have shown that carbohydrate malabsorption is especially severe among children with immune depression. Arpadi (2000) has also shown that those people with more severe malabsorption have lower body mass indices. The Zambian study by Amadi and colleagues (2001) clearly shows that children with HIV/AIDS can

have devastating severity of diarrhoea, which makes it a huge challenge to keep pace with rehydration therapy. The impact of HIV on villi, specific enzyme deficiencies in intestinal mucosa, the effect of opportunistic infections and altered intestinal transit could be possible mechanisms responsible for malabsorption in HIV/AIDS.

Loss of body protein during HIV/AIDS is therefore caused by poor diet, malabsorption, endogenous intestinal losses and altered metabolism; all are more striking during opportunistic infection (Macallan *et al.*, 1995).

### 2.5.3 Changes in metabolism

Production of cytokines as a result of HIV infection and replication affects metabolism (Tomkins, 2003). Cytokines are chemical messengers and growth factors produced by lymphocytes in the blood to help direct the inflammatory immune process (Jahoor *et al.*, 1999). These inflammatory responses begin as soon as a person is infected with HIV and are important as they increase the nutrient requirements of the host (Macallan, 1999; Tomkins & Watson, 1989).

There are also endocrine/hormonal changes in patients with HIV and AIDS - such as hypogonadism, (reduced or absent secretion of hormones from the sex glands). Testosterone levels in particular may be depressed accompanied by a substantial loss of muscle or lean body mass (Tomkins & Watson, 1989). The preferential depletion of protein has led some to suggest that people with HIV should include more protein in their diets. However, there is no clinical evidence to support increasing the proportion of protein above the levels required in a normal balanced diet (12 to 15% of the total energy intake) (Tomkins as quoted by Smart, 2005).

Underlying malnutrition is a major contributor to death from an illness, particularly for children under 5. Recent data demonstrates that this holds true in HIV disease and AIDS as well. A cotrimoxazole prophylaxis study done in Zambia showed that low weight for age or low weight for height were independently associated with a substantially increased risk of mortality from malnutrition in children less than 15 years of age (Grimwade & Swingler, 2006).

#### 2.5.4. The effects of protein/energy supplementation on HIV infection

Karsegard and colleagues (2004) conducted a 12 week randomised controlled trial (RCT) on the effect of L-ornithine  $\alpha$ -ketoglutarate (OKG) in 46 HIV-infected patients. They found that there was an increase in the following as compared to the baseline values: body mass index-BMI ( $p = 0.02$ ) and triceps skin-fold thickness ( $p < 0.05$ ). However, oral OKG failed to improve the nutritional, immunologic status in weight-losing HIV-infected patients. They concluded that food supplementation and diet counseling improved patients' BMI and triceps skin-fold thickness.

A shorter 7 week RCT study by Rochon *et al.* (2003) on 12 HIV-infected men using tonexis HP with methionine and medroxyprogesterone failed to show a significant benefit in terms of body weight ( $p < 0.05$ ) for all patients.

Another 14 day RCT study by Swanson and colleagues (2002) on 11 clinically stable HIV-infected adults using arginine showed an increase in mean natural killer cytotoxicity of 18.9 lytic units (treatment) as compared to 0.3 lytic units in the control group. It should be noted that the difference was not statistically significant ( $p = 0.79$ ).

De Luis Roman *et al.* (2001) gave an enterotopic peptide-based formula enriched with n-3 fatty acids (3 cans/day) to 74 HIV-infected patients in a RCT for 3 months. The subjects gained weight (3.2 % in control vs. 3.1 % in treatment group). In addition the fat mass of subjects also increased (12.8 % in control vs. 7.5 % in treatment group). They concluded that oral nutritional supplements for a 3 month period were well tolerated and increased CD4 count in treatment group ( $576 \pm 403$  vs.  $642 \pm 394$  cells/mm<sup>3</sup>,  $p < 0.05$ ).

A 6 month RCT study by Pichard *et al.* (1998) involving 64 HIV-infected patients using arginine with omega-3 fatty acids and a nutritional supplement providing 606 kcal/day found a no significant change in CD4 and CD8 lymphocyte counts, viraemia and tumor necrosis factor. However there was an increase in body weight (by 2 kg) and fat (by 1 kg) in both groups.

A 2.5 hour cross-sectional study by Laurichesse *et al.* (1998) involving 7 male AIDS patients sought to demonstrate the rate-limiting amino acids for protein synthesis by looking for a lack of rise in plasma level when amino acids were administered as part of a complete amino acid glucose mixture. The researchers concluded that threonine and methionine may be rate limiting for whole body protein synthesis in AIDS patients. There was a decrease in basal levels for threonine, valine and lysine ( $p < 0.05$ ) and methionine ( $p < 0.073$ ) in AIDS patients than in control subjects.

All the results show that where dietary intake is already satisfactory, supplements are unlikely to be beneficial; in addition supplements can restore lean body mass where the patients are relatively free from opportunistic infections. Hence adequate nutritional intake as well as dietary counselling is very crucial during the early stages of HIV infection. Table 2.1 is a summary of studies on macronutrients and HIV outlined above.

**Table 2.1:** Effect of protein/energy supplementation on HIV disease progression

Author, year	Country	Target	Study design	Macro-nutrient	Duration	Outcome
Karsegard <i>et al.</i> (2004)	Switzerland	46 HIV+ patients	RCT	10 g/d of L-ornithine $\alpha$ -ketoglutarate (OKG)	12 wks	↑ BMI ( $p = 0.02$ vs. baseline) ↑ TSFT ( $p < 0.05$ vs. baseline) ↑ frequency of gastrointestinal symptoms in the OKG group (86 % vs. 54 % in control, $p = 0.025$ )
Rechon <i>et al.</i> (2003)	France	12 HIV+ men	RCT	Tonexis HP (0.7 g protein/kgBW/d); L-threonine (0.018 g/kgBW/d); L-methionine (0.013 g/kgBW/d) Medroxyprogesterone (0.4 g/d) on the last 3 wks of the experiment period	7 wks	↑ BW ( $p < 0.05$ ) for all patients Treatment group tended to show a higher but not significant weight gain (+1.3 $\pm$ 1.0 kg in treatment group, and +1.9 $\pm$ 0.3 kg in control group)
Swanson <i>et al.</i> (2002)	USA	11 clinically stable HIV+ adults	RCT	Arginine (19.6 g/d)	14 d	↑ mean natural killer cytotoxicity of 18.9 lytic units (treatment group), and 0.3 lytic units (control group) The difference was not statistically significant ( $p = 0.79$ )

HIV+ = HIV infected; RCT = randomized double-blind placebo controlled trial, g/d = grams/day; wks = weeks; mo = months; BMI = body mass index; TSFT = triceps skin-fold thickness; BW = body weight; TBW = total body weight; FFM = fat free mass; ↑ = increase; ↓ = decrease; kcal = kilocalories

**Table 2.1:** Effect of protein/energy supplementation on HIV disease progression

Author, year	Country	Target	Study design	Macro-nutrient	Duration	Outcome
De Luis Romain <i>et al.</i> , (2001)	Spain	74 HIV+ patients	RCT	Enterotopic peptide-based formula enriched with n-3 fatty acids (3 cans/d, 236 ml/can)	3 mo	↑ weight (3.2 % in control vs. 3.1 % in treatment group) ↑ fat mass (12.8 % in control vs. 7.5 % in treatment group) NS effect on TBW and FFM, CD4 count the same in control group ↑CD4 count in treatment group (576 ± 403 vs. 642 ± 394 cells/mm <sup>3</sup> , p < 0.05) ↓ hospitalizations in treatment group but not statistically significant
Pichard <i>et al.</i> , (2000)	Switzerland	64 HIV+ patients	RCT	7.4 g arginine plus 1.7 g omega-3 fatty acids; nutritional supplement (606 kcal with vitamins, trace elements and minerals)/d	6 mo	NS in CD4 and CD8 lymphocyte counts, viraemia, tumour necrosis factor soluble receptors ↑ BW (2 kg) in both groups ↑ fat (1 kg) in both groups
Lauchess <i>et al.</i> , (1998)	France	7 male AIDS patients	Cross-sectional	Amino-acid glucose mixture	2.5 hours	↓ basal levels for threonine, valine, lysine (p < 0.05) and methionine (p < 0.073) in AIDS patients than in control subjects

HIV+ = HIV infected; RCT = randomized double-blind placebo controlled trial, g/d = grams/day; wks = weeks; mo = months; BMI = body mass index; TSFT = triceps skin-fold thickness; BW = body weight; TBW = total body weight; FFM = fat free mass; ↑ = increase; ↓ = decrease; kcal = kilocalories

## 2.6 Role of micronutrients in HIV disease progression

Over the last few years, several studies have been carried out to investigate the role of micronutrient supplements on the course of HIV/AIDS, yet results of these studies have not been conclusive.

Micronutrients play important roles in maintaining immune function and neutralising the reactive oxygen intermediates produced by activated macrophages and neutrophils in their response to micro-organisms (Evans & Halliwell, 2001; Whitney & Rolfes, 2005:321). Serum and plasma measurements of vitamins and trace elements have shown that deficiencies are common among HIV-infected persons, especially those who are underprivileged, such as women in developing countries, and injection-drug users (Allard *et al.*, 1998; FANTA, 2001).

Friis and Michaelsen (1998), state that micronutrient deficiencies may affect replication of the invading virus. Micronutrient deficiencies, existing prior to HIV infection, precipitated by symptomatic primary infection or caused by established HIV infection, may affect transmission as well as clinical course of HIV infection. It should be noted that mechanisms of how micronutrient deficiencies affecting HIV progression to AIDS are not yet known.

According to Lewis *et al.* (2005) micronutrient deficiencies may exacerbate the oxidative stress induced by HIV. Lewis and colleagues (2005) followed 40 relatively healthy, institutionalized HIV-infected individuals aged between 20-47 years in Italy for assessment before or three months after fresh fruit and vegetable supply were increased due to seasonal supply. They found that HIV infection and its progression led to an increased requirement for nutritional micronutrients, especially antioxidants. They found increases in vitamin A ( $655.8 \pm 123.3 \mu\text{g/day}$  to  $787.4 \pm 178.3 \mu\text{g/day}$ ;  $p = 0.002$ ), vitamin C ( $69.8 \pm 27.6 \text{ mg/day}$  to  $115.5 \pm 39.3 \text{ mg/day}$ ;  $p = 0.009$ ), and vitamin E ( $7.75 \pm 1.27 \text{ mg/day}$  to  $8.71 \pm 1.22 \text{ mg/day}$ ;  $p = 0.004$ ) intakes, and no significant differences in protein and energy intake. A number of redox indices were modified e.g. there was an increase in total antioxidant status, glutathione peroxidase, and glutathione and a decrease

in superoxide dismutase during the study period. However, no significant change was noted in malondialdehyde, peroxides or DNA damage. The study concluded that the increase of dietary intake of fruits and vegetables for a period of three months had some beneficial effects on nutrition, systemic redox balance, and immune parameters in HIV-infected persons.

### **2.6.1 Vitamin A, $\beta$ -carotene and HIV infection**

Vitamin A and its precursor,  $\beta$ -carotene, are important in maintaining a healthy lining of the skin, lungs and gut. Vitamin A deficiency (VAD) increases the severity of diseases such as diarrhoea, and impairs epithelial cells in the mucous membranes while infection increases the loss of vitamin A from the body (Stephens *et al.*, 1996). In the body,  $\beta$ -carotene may act as an antioxidant capable of protecting the body against diseases e.g. halting oxidative stress in HIV disease progression (Allard *et al.*, 1998; FANTA, 2001; Gil *et al.*, 2005).

### **2.6.2 Trials with vitamin A and HIV infection**

A randomised, double blind, placebo controlled trial conducted by Fawzi *et al.* (2000) in Tanzania involving 687 children hospitalised with pneumonia who were either HIV-infected or not between the ages of 6 months to 5 years evaluated the effect of vitamin A on the risk of diarrhoea and acute respiratory infection. Children were randomly assigned in blocks of 20 to receive a dose of vitamin A or placebo at baseline, at 4 months, and at 8 months after discharge from hospital at dosages of:

- ⌘ 200,000 IU(60 mg of retinol in corn oil per mililiter as retinol palmitate),
- ⌘ both placebo and vitamin A solutions contained a small amount of vitamin E (0.24 mg/mL) as an antioxidant to enhance the stability of the product over time, and
- ⌘ children older than 12 months received 1 mL of the solution, while infants were given half that amount.

Relative to those receiving placebo, children receiving vitamin A had a significantly smaller risk of severe watery diarrhoea (multivariate odds ratio = 0.56, 95% CI = 0.32-0.99,  $p = 0.04$ ). However, they had a higher risk of cough and rapid respiratory rate

(multivariate odds ratio = 1.67, 95% CI = 1.17-2.36,  $p = 0.004$ ). The apparently increased risk of respiratory tract infections was limited to children who were HIV seronegative ( $p$  value for interaction = 0.07). They found that vitamin A was also associated with increased risk of acute diarrhoea among normally nourished children or children with stunted growth but was relatively protective among children who were HIV-infected and with the wasting disease ( $p$  value for interaction = 0.01).

In another randomised, double-blind, placebo-controlled trial by Filteau *et al.* (2001) the effect of antenatal vitamin A and  $\beta$ -carotene supplementation on gut integrity of infants of HIV-infected women in South Africa was studied. HIV-infected mothers received either vitamin A during pregnancy (1.5 mg retinyl palmitate and 30 mg  $\beta$ -carotene daily) plus 60 mg retinyl palmitate at delivery or placebo. The results showed that vitamin A supplementation of HIV-infected pregnant women may prevent the deterioration in gut integrity in the subgroup of their infants who themselves become infected. Although this evidence may be less strong as it is based on subgroup effects from one RCT, this shows that improving vitamin A status of HIV-infected infants may decrease their gastrointestinal morbidity and reduce postnatal mother-to-child HIV transmission.

Furthermore, Read *et al.* (1999) studied the role of vitamin A status on mortality and morbidity in 207 HIV-infected children aged from 1 month to 12 years in a longitudinal, correlational study in North America. This study assessed baseline vitamin A levels and the rate of change in levels over the study period. They found that vitamin A levels were not associated with increased morbidity and survival time by multivariate analysis. It should also be noted that the subjects were not vitamin A deficient.

In another RCT, Zimbabwean infants given 50 000 IU of vitamin A orally at birth and 400 000 IU of vitamin A given to their mothers found no significant effect of maternal nor neonatal vitamin A supplementation on postnatal mother-to-child-transmission (MTCT) (Humphrey *et al.*, 2006). This study shows that vitamin A supplements do not appear to have an effect on HIV transmission during pregnancy or the intrapartum period.

In addition, vitamin A supplements were also associated with an overall non-significant reduction of 14% in the risk of developing severe anaemia (adjusted prevalence ratio = 0.86, 95% CI = 0.37, 1.99; P = 0.73) (Villamor *et al.*, 2000). Consequently, Miller and colleagues (2006) found that vitamin A supplementation had no effect on haemoglobin (Hb) or anaemia (Hb < 105 g/L) in Zimbabwean HIV-infected infants and mothers. They found that infant HIV infection increased anaemia risk by more than 6-fold.

The study by Semba *et al.* (2005) showed that Ugandan HIV-infected children given 60 mg RE of vitamin A had a decreased mortality rate, lower persistent cough and chronic diarrhoea. However there was no significant effect of vitamin A supplementation on fever, ear discharge, bloody stools or hospitalisations. This study shows that there is some association between vitamin A supplementation and morbidity and mortality.

Supplementation of Kenyan HIV and herpes virus (HSV) co-infected women with vitamin A for six weeks found a no significant detection of genital HSV DNA. Baeten *et al.* (2004) concluded in this RCT that vitamin A supplementation is unlikely to decrease HSV shedding and infectivity in women.

Camp and colleagues (1998) reported a high HIV load associated with rapid progression and low serum retinol in late but not early in disease progression in HIV-infected Rwandan adults. Consequently, a longitudinal study by Mugusi *et al.* (2003) reported that mean vitamin A increased at 2 months in HIV-uninfected Tanzanian patients and not in HIV-infected adults, concluding that VAD is common in TB and HIV infection. These studies show that plasma vitamin A and low serum levels are associated with HIV disease progression leading to VAD.

A RCT by Villamor and colleagues (2003) involving supplementation of vitamin A to Tanzanian children with pneumonia reported that vitamin A supplementation increased linear and ponderal growth in HIV-infected infants. Hence vitamin A supplementation decreases risk of stunting associated with persistent diarrhoea. This study shows that

vitamin A supplements results in improvements in health outcomes linked to growth among HIV-infected children with pneumonia.

Kennedy *et al.* (2001) reported an effect on weight retention and not weight gain six months post-partum ( $P = 0.02$ ) in HIV-infected South African women in a RCT involving vitamin A supplementation during pregnancy and at delivery. This study shows an association between vitamin A supplementation and weight retention in HIV-infected women.

In conclusion, prenatal vitamin supplements do not appear to reduce the rate of vertical HIV transmission in utero or during the intrapartum period. Furthermore, there is an association between VAD and the stage of HIV disease progression. However research is needed to demonstrate the safety and efficacy of providing these interventions in HIV-infected populations.

### ***2.6.3 Zinc, selenium and HIV infection***

The body maintains a couple lines of defense against free radical damage. A system of enzymes disarms the most harmful oxidants e.g. glutathione peroxidase, thioredoxin reductase, superoxide dismutase and catalase. The action of these enzymes depends on the following minerals:

- ⌘ Zinc
- ⌘ Selenium
- ⌘ Copper
- ⌘ Manganese

Zinc and selenium are important for activating the immune system. Hence, if the diet fails to provide adequate supplies of these minerals, this line of defense weakens and is worsened in the case of HIV infection. Zinc and selenium stimulate antioxidant and repair enzyme activity in HIV infection.

Baum (2000) states that, in both HIV-1 infected adults and children, selenium is an essential micronutrient that is associated with an improvement of T cell function and

reduced apoptosis in animal models. Adequate selenium may enhance resistance to infections through modulation of interleukin (IL) production and subsequently the T helper lymphocytes (Th1/Th2 response). Th1 cells are especially effective when cellular response is needed in response to antigens such as viruses, whereas Th2 cells are helpers for B cells and appear to be adapted to support antibody response and defense against parasites. Thus, during diseases that require cellular defense, the Th1 response is activated.

In particular zinc's role in resistance to infections caused by virus, bacteria and fungi is to confer biological activity to the thymic hormone-thymulin which has differentiation properties on T-cell lines, hence essential for the formation of T-lymphocytes. Zinc also inhibits the production of the tumor necrosis factor (TNF), which is implicated in the pathophysiology of cachexia and wasting in AIDS. In infection with HIV, the zinc-bound form of thymulin (active thymulin-ZnFTS) is strongly reduced in stage IV of the disease (CDC disease classification) with concomitant decrements in CD4+ cell count and zincemia values. The zinc-unbound form of thymulin (inactive thymulin, FTS) is in contrast very high (Baum, 2000; Mocchegiani & Muzzioli, 2000).

In conclusion, these trace elements could be possible predictors of disease progression among HIV-infected populations.

#### **2.6.4 Studies of zinc and HIV infection**

Few zinc supplementation studies have been conducted in HIV/AIDS patients. The latest zinc trial was done by Mocchegiani and colleagues in 1995. They found that supplementation with zinc (at the dosage of 45 mg Zn<sup>2+</sup>/day), three times the recommended daily allowance (RDA) of the United States Food and Drug Administration (USFDA-1976) concomitant with antiretroviral therapy (ART) in stage IV (12 young patients) for a period of 4 months resulted in an increase of CD4+ cells from 80 ± 10 mm<sup>3</sup> at time 0 to 121 ± 9 mm<sup>3</sup> at day 120 of observation time (Mocchegiani *et al.*, 1995).

### **2.6.5 Observational studies of zinc, selenium and HIV infection**

In a longitudinal study by Campa *et al.* (1999) evaluating selenium, albumin, iron and zinc status on mortality in 24 HIV-infected children between the ages of 1.2 and 9.3 years. The results showed that one third of subjects had inadequate selenium levels, and low selenium was the only nutrient that independently predicted mortality. In subjects who died, those who were selenium deficient died at a younger age and were rapid progressors.

However, a follow-up study by Baeten and colleagues (2001) reported no significant association between selenium deficiency and vaginal or cervical shedding in a cross-sectional study involving HIV-infected Kenyan women. Vaginal or cervical shedding is a frequently used surrogate marker of infectivity (John-Stewart *et al.*, 2005). In this instance, a study by John-Stewart *et al.* (2005) found that pregnant women infected with HIV-subtype C were significantly more likely to shed HIV-1 vaginal cells than were those infected with subtype A or D (odds ratio [OR], 3.6 [95 % confidence interval, 1.4-8.8]; P = 0.006). With respect to selenium and zinc, Campa and colleagues (1999) found that these two micronutrients could prove beneficial.

Although conclusive evidence is lacking, some data suggest that selenium and zinc could prove beneficial (Baeten *et al.*, 2001; Campa *et al.*, 1999).

### **2.6.6 Trials with multiple micronutrients**

Not all studies, however, show benefit of single nutrient supplementation e.g. vitamins B<sub>6</sub>, C, E, B<sub>12</sub>, folate and iron; and this might be because the subjects studied have multiple nutrient deficiencies (Calder & Jackson, 2000).

A randomised, double-blind, placebo controlled study was done by Fawzi *et al.* (2004) involving HIV infected pregnant women in Dar es Salaam, Tanzania, to evaluate the effects of daily supplements of vitamin A, multivitamins (vitamins B, C, and E), or both on progression of HIV disease, using survival models over a 2 year period. The HIV-

infected pregnant women were to receive a daily oral dose of one of the following four regimens for the duration of the follow-up:

- ⌘ vitamin A alone (30 mg of  $\beta$ -carotene plus 5000 IU of preformed vitamin A),
- ⌘ multivitamins excluding vitamin A (20 mg of vitamin B<sub>1</sub>, 20 mg of vitamin B<sub>2</sub>, 25 mg of vitamin B<sub>6</sub>, 100 mg of niacin, 50  $\mu$ g of vitamin B<sub>12</sub>, 500 mg of vitamin C, 30 mg of vitamin E, and 0.8 mg of folic acid),
- ⌘ multivitamins plus vitamin A in the same doses listed above, and
- ⌘ placebo.

They found that the 2 groups provided with multivitamin supplements had a delayed progression of HIV disease than the placebo group. There was an increase in CD4+ and CD8+ cell counts and lower viral loads. Furthermore, a decrease in mortality rate in the treatment group e.g. 67/271 in stage 4 or dying whilst the control group had 83/267 deaths (24.7 percent versus 31.1 percent; relative risk, 0.71; 95 percent confidence interval, 0.51 to 0.98;  $p = 0.04$ ). This regimen was also associated with reductions in the relative risk of death related to AIDS (0.72; 95 percent confidence interval, 0.51 to 1.04;  $p = 0.09$ ), progression to stage 4 (0.50; 95 percent confidence interval, 0.28 to 0.90;  $p = 0.02$ ), or progression to stage 3 or higher (0.72; 95 percent confidence interval, 0.58 to 0.90;  $p = 0.003$ ). The effects of receiving vitamin A alone were smaller, hence not significantly different from those produced by placebo. They concluded that multivitamin supplementation delay the progression of HIV disease and provide an effective, low-cost means of delaying the initiation of antiretroviral therapy in HIV-infected pregnant women.

The data confirms the relationship between HIV infection and malnutrition. It shows that HIV infection impairs micronutrient status; in turn micronutrient status and intake affect HIV progression and mortality (Amadi *et al.*, 2005; Fawzi *et al.*, 2004; Kruzich *et al.*, 2004; Lewis *et al.*, 2005).

Amadi *et al.* (2005) performed a 4 week randomised controlled trial in Zambia of an exclusive diet of amino acid based elemental feed (AAF) with vitamin and mineral composition similar to that of breastmilk or placebo to 200 (106 HIV seropositive, 90

HIV seronegative) hospitalised and malnourished children. The main outcome measures were weight gain, recovery from diarrhoea and mortality. The results showed that weight gain was greater in the AAF group (median gain in weight-for-age z-score was 1.23, interquartile range-IQR 0.89-1.57) compared with the control group (0.87, IQR 0.47-1.25;  $p = 0.002$ ), although calorie intakes were higher in the control group. The increase in haemoglobin concentration was also greater in the AAF group (0.8 g/dl, IQR 0-1.8) than in the control group (0.3, IQR -0.6, -1.6;  $p = 0.04$ ). Diarrhoea frequency and global recovery scores improved equally in both treatment groups and mortality did not differ.

A randomised placebo-controlled trial by Jiamton *et al.* (2003) in Bangkok, evaluated the impact of multiple micronutrient supplementations on mortality among 481 HIV-infected individuals for a period of 48 weeks. The micronutrients comprised a comprehensive mix of vitamins and minerals and corresponded to daily doses of vitamin A 3000  $\mu\text{g}$ ,  $\beta$ -carotene 6 mg, vitamin D<sub>3</sub> 20  $\mu\text{g}$ , vitamin E 80 mg, vitamin K 180  $\mu\text{g}$ , vitamin C 400 mg, vitamin B<sub>1</sub> 24 mg, vitamin B<sub>2</sub> 15 mg, vitamin B<sub>6</sub> 40 mg, vitamin B<sub>12</sub> 30  $\mu\text{g}$ , folacin 100  $\mu\text{g}$ , pantothenic acid 40 mg, iron 10 mg, magnesium 200 mg, manganese 8 mg, zinc 30 mg, iodine 300  $\mu\text{g}$ , copper 3 mg, selenium 400  $\mu\text{g}$ , chromium 150  $\mu\text{g}$  and cystine 66 mg. The results showed that multiple micronutrient supplementation enhances the survival of HIV-infected individuals with CD4 cell counts  $<200 \times 10^6/\text{l}$ . The death rate was lower in the micronutrients arm with the mortality hazard ratios [95% confidence interval (CI)] of 0.53 (0.22-1.25;  $p = 0.1$ ) overall. In addition 0.37 (0.13-1.06;  $p = 0.052$ ) and 0.26 (0.07-0.97;  $p = 0.03$ ) among those with CD4 cell counts  $< 200 \times 10^6/\text{l}$  and,  $100 \times 10^6/\text{l}$  respectively. This study shows that there was no impact of multiple micronutrient supplements on CD4 cell count or plasma viral load.

Kruzich *et al.* (2004) conducted a cross-sectional study in the United States of America, to examine the association between micronutrient intakes and human immunodeficiency virus (HIV) in 264 HIV-infected and 127 HIV-uninfected youths who were at increased nutritional risk because of the demands of growth and disease as well as poor dietary habits. They found that young patients with HIV are at a higher risk of being deficient in

the vitamins A and E, and zinc. The reason being young patients are at a stage where they also have increased nutrient requirements.

With respect to effects on HIV progression, evidence from randomised controlled trials shows that regular supplementation with multivitamins and other multi-micronutrients may reduce diarrhoeal morbidity and mortality in children less than 5 years of age (Fawzi *et al.*, 2000; Filteau *et al.*, 2001). In addition, delayed HIV progression has been shown in adults and HIV-infected pregnant women on multi-micronutrient supplementation (Fawzi *et al.*, 2004; Jiamton *et al.*, 2003).

Data also confirm that micronutrients as supplements play an important role in HIV progression and quality of life (Campa *et al.*, 1999; Lewis *et al.*, 2005; Fawzi *et al.*, 2000; Filteau *et al.*, 2001; Jiamton *et al.*, 2003). The results show that although micronutrient supplements may be beneficial in some settings e.g. vitamin A (Filteau *et al.*, 2001), the same micronutrient supplement may have adverse effects in others (Fawzi *et al.*, 2000). Data from consumption of fruits and vegetables has also shown an increase in total antioxidant status which may reduce progression and mortality among adults (Lewis *et al.*, 2005).

Table 2.2 is a summary of the trials outlined above.

Table 2.2: Summary of micronutrient and HIV-1 studies

Author, Year	Country	Target	Study design	MN	Duration	Outcome
Miller <i>et al.</i> , (2006)	Zimbabwe	14 110 mothers, 2 854 infants	RCT	Vitamin A 400 000 IU (mothers), 50 000 IU (infants)	8-14 mo	NS effect of vitamin A on Hb or anaemia (Hb < 105g/L.) Infant HIV infection ↑ anaemia risk >6 fold NS effect of maternal HIV infection on anaemia
Humphrey <i>et al.</i> , (2006)	Zimbabwe	14 110 mothers, 4 495 infants (born to HIV+ women)	RCT	Vitamin A 400 000 IU (mothers), 50 000 IU (infants)	24 mo	NS effect of maternal nor neonatal vitamin A supplementation on postnatal MTCT
Amadi <i>et al.</i> , (2005)	Zambia	200 hospitalised 106 HIV+, 90 HIV- children	RCT	Amino acid based elemental feed with vitamin and mineral composition similar to breast-milk	4 wks	↓ diarrhoea ↑ weight gain
Lewis <i>et al.</i> , (2005)	Italy	40 HIV+ individuals (20-47 years old)	Observational	Vitamin A, C & E (in fruits & vegetables)	3 mo	↑ total antioxidant status ↑ glutathione peroxidase ↑ glutathione ↓ superoxide dismutase NS effect on malondialdehyde peroxides or DNA damage

RCT = randomised, double-blind, placebo controlled trial; MN = micronutrients; HIV+ = HIV positive; HIV- = HIV negative; wks = weeks; mo = months; yrs = years; ↓ = decrease/reduction; ↑ = increase/improvement; Hb =

haemoglobin; MTCT = mother to child transmission; < = less than; > = greater than; RE = retinol equivalent; HSV herpes virus; Se = selenium; NS = no significant

**Table 2.2: Summary of micronutrient and HIV-1 studies**

Author, Year	Country	Target	Study design	MN	Duration	Outcome
Semba <i>et al.</i> , (2005)	Uganda	181 HIV+ children (15–36 mo)	RCT	Vitamin A 60 mg RE	21 mo	↓ mortality rate in Vitamin A group (20,6 %); 32,9 % in control group ↓ persistent cough (OR: 0.47; 95 % CI, 0.23 to 0.96; p = 0,038); chronic diarrhoea (OR: 0.48; 95 % CI, 0.19 to 1.18; p = 0.11) and a shorter duration of ear discharge (p = 0.03) in Vitamin A group
Baeten <i>et al.</i> , (2004)	Kenya	376 HIV+ & HSV+ women	RCT	Vitamin A	6 wks	NS detection of genital HSV DNA (40 % treatment group vs. 44 % control group; p = 0.5)
Fawzi <i>et al.</i> , (2004)	Tanzania	HIV+ pregnant women	RCT	Vitamin A (30 mg β-carotene + 5 000 IU preformed vitamin A) Multivitamins (20 mg of B <sub>2</sub> , 25 mg B <sub>6</sub> , 100 mg niacin, 50 µg B <sub>12</sub> , 500 mg vitamin C, 30 mg vitamin E, 0.8 mg of folic acid)	2 yrs	↓ HIV progression ↑ CD4+ and CD8+ ↓ viral loads ↓ mortality

RCT = randomised, double-blind, placebo controlled trial; MN = micronutrients; HIV+ = HIV positive; HIV- = HIV negative; wks = weeks; mo = months; yrs = years; ↓ = decrease/reduction; ↑ = increase/improvement; Hb = haemoglobin; MTCT = mother to child transmission; < = less than; > = greater than; RE = retinol equivalent; HSV herpes virus; Se = selenium; NS = no significant; mg = milligrammes, IU = international unit, mg/mL = milligrammes per milliliter

**Table 2.2:** Summary of micronutrient and HIV-1 studies

Author, Year	Country	Target	Study design	MN	Duration	Outcome
Kruzych <i>et al.</i> , (2004)	USA	264 HIV+; 127 HIV- youths	Cross-sectional	Vitamin A, E & zinc status	Not reported	↑ risk of nutrient deficiency
Jiamon <i>et al.</i> , (2003)	Thailand	481 HIV+ individuals	RCT	Vitamin A 3000 µg, β-carotene 6 mg, Vitamin C 400 mg, Zinc 30 mg, Selenium 400 µg, Iron 10 mg, & other minerals	48 wks	↓ mortality rate NS effect on CD4+ cell count NS effect on plasma viral load
Mugusi <i>et al.</i> , (2003)	Tanzania	100 HIV+ & HIV- TB patients, blood donors	Cross-sectional	Vitamin A	2 mo	↓ mean vitamin A status in HIV+ than HIV- donors ↑ mean vitamin A at 2 mo in HIV- patients VAD common in TB & HIV infection
Villamor <i>et al.</i> , (2002)	Tanzania	687 children with pneumonia (6–60 mo)	RCT	Vitamin A 200 000 IU	8 mo	↑ length in treatment group ↓ risk of stunting associated with persistent diarrhoea
Kennedy <i>et al.</i> , (2001)	South Africa	312 HIV+ pregnant women	RCT	Vitamin A 5 000 IU retinyl palmitate; 30 mg β-carotene 200 000 IU retinyl palmitate	~15 mo	Weight retention 3-6 mo postpartum (p = 0.02) NS effect on weight gain

RCT = randomised, double-blind, placebo controlled trial; MN = micronutrients; HIV+ = HIV positive; HIV- = HIV negative; wks = weeks; mo = months; yrs = years; ↓ = decrease/reduction; ↑ = increase/improvement; NS =

haemoglobin; MTCT = mother to child transmission; < = less than; > = greater than; RE = retinol equivalent; HSV herpes virus; Se = selenium; NS = no significant; IU = (international unit, mg/mL = milligrammes per milliliter.

**Table 2.2:** Summary of micronutrient and HIV-1 studies

Author, Year	Country	Target	Study design	MN	Duration	Outcome
Baeten <i>et al.</i> , (2001)	Kenya	318 HIV+ women	Cross-sectional	Se	Not reported	NS association between Se deficiency & vaginal or cervical shedding
Filleau <i>et al.</i> , (2001)	South Africa	HIV+ mothers	RCT	1.5 mg retinyl palmitate; 30 mg $\beta$ -carotene; 60 mg retinyl palmitate	14 wks post-partum	↓ gastrointestinal morbidity
Fawzi <i>et al.</i> , (2000)	Tanzania	687 children HIV+ & HIV- (6 mo – 5 yrs)	RCT	200,000 IU (60 mg retinol palmitate), Vitamin E (0.24 mg/mL)	8 mo	↓ diarrhoea (HIV+ children) ↑ diarrhoea (HIV- children) NS ↓ in risk of severe anaemia in both groups
Read <i>et al.</i> , (1999)	North America	207 HIV+ children (1 mo – 12 yrs)	Longitudinal-correlational	Vitamin A status	Not reported	No association between vitamin A status & ↑ morbidity
Campa <i>et al.</i> , (1999)	Not reported	24 HIV+ children (1.2 yrs – 9.3 yrs)	Longitudinal correlational	Se, iron, albumin & zinc status	Not reported	Se deficient children died at a younger age
Camp <i>et al.</i> , (1998)	Rwanda	30 HIV+ people	Longitudinal	Vitamin A status	26 – 90 mo	↑ viral load associated with rapid progression & ↓ serum retinol in late but not early in disease progression

RCT = randomised, double-blind, placebo controlled trial; MN = micronutrients; HIV+ = HIV positive; HIV- = HIV negative; wks = weeks; mo = months; yrs = years; ↓ = decrease/reduction; ↑ = increase/improvement; Hb =

haemoglobin; MTCT = mother to child transmission; < = less than; > = greater than; RE = retinol equivalent; HSV = herpes virus; Se = selenium; NS = no significant

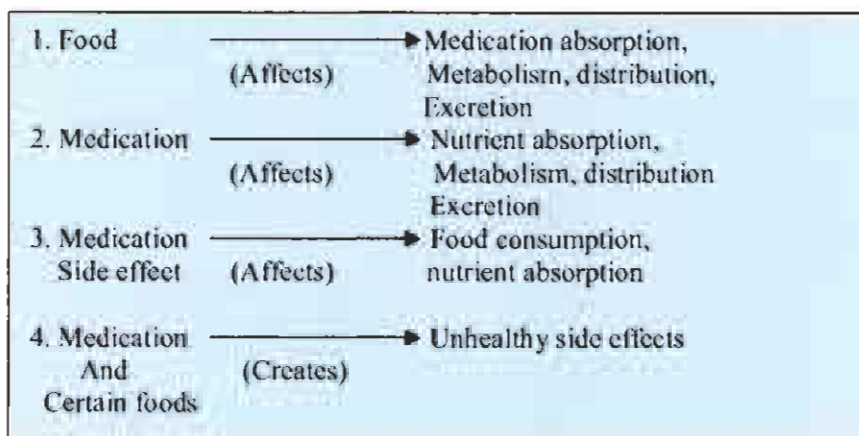
Conclusive evidence with regards to micronutrient supplementation is lacking hence the World Health Organization (WHO) and the Joint United Nations Programme on HIV/AIDS (UNAIDS) recommendations for micronutrient supplementation are therefore the same for people whether they are infected or not. In addition, WHO and UNAIDS recommend a good mixed diet whenever possible, consumption of fortified foods and micronutrient supplementation as needed (WHO, 2005).

## 2.7 Antiretroviral drugs and nutrition

Antiretroviral drugs (ARVs) block the virus's ability to replicate. They are not a cure for HIV/AIDS; however ARVs can improve a person's quality of life by delaying the onset of AIDS and slowing the loss of a patient's CD4+ cells (Castleman *et al.*, 2004; WHO, 2003). There are four main classes of drugs, operating at different points in the HIV cycle (Figure 1) and they are:

- ⌘ **Entry inhibitors:** these stop the HIV from entering the cell, by binding on to the proteins outside the HI virus. This hinders the HI virus from attaching itself and entering a CD4+ cell. Only one drug, *fuzeon*, has so far reached the global market (Anon *et al.*, 2006; Castleman *et al.*, 2004; WHO, 2003).
- ⌘ **Nucleoside reverse transcriptase inhibitors:** these disrupt the gene-copying process by supplying faulty versions of the building blocks. Drugs include *abacavir*, *zidovudine*, *didanosine* *lamuvidine* and *stavudine tenofovir* (Anon *et al.*, 2006; Castleman *et al.*, 2004; WHO, 2003).
- ⌘ **Non-nucleoside reverse transcriptase:** these block the gene-copying enzyme reverse transcriptase. Drugs include *nevirapine* and *efavirenz* (Anon *et al.*, 2006; Castleman *et al.*, 2004; WHO, 2003).
- ⌘ **Protease inhibitors:** these block the formation of new viruses, by locking onto another enzyme, protease, which plays a key role in the assembly of the new virus particles. Drugs include *amprenavir*, *lopinavir*, *ritonavir*, *nelfinavir* and *saquinavir* (Anon *et al.*, 2006; Castleman *et al.*, 2004; WHO, 2003).

Food and drug interactions are an important issue for effectiveness and tolerability of highly active antiretroviral therapy (HAART) regimens or triple combination therapy. Interactions between ARVs and nutrition can affect medication efficacy, nutritional status and adherence to drug regimens (Castleman *et al.*, 2004). The presence of food in the gastrointestinal tract can influence the absorption of several HIV medications such as *didanosine*, *indinavir*, *saquinavir* and *nefvinavir*. People who eat properly and regularly benefit more from ARVs, and there seem to be fewer side-effects from ARVs when nutrition is good (Macallan, 1999). Figure 2.6 is an illustration of the interactions between medications and nutrition.

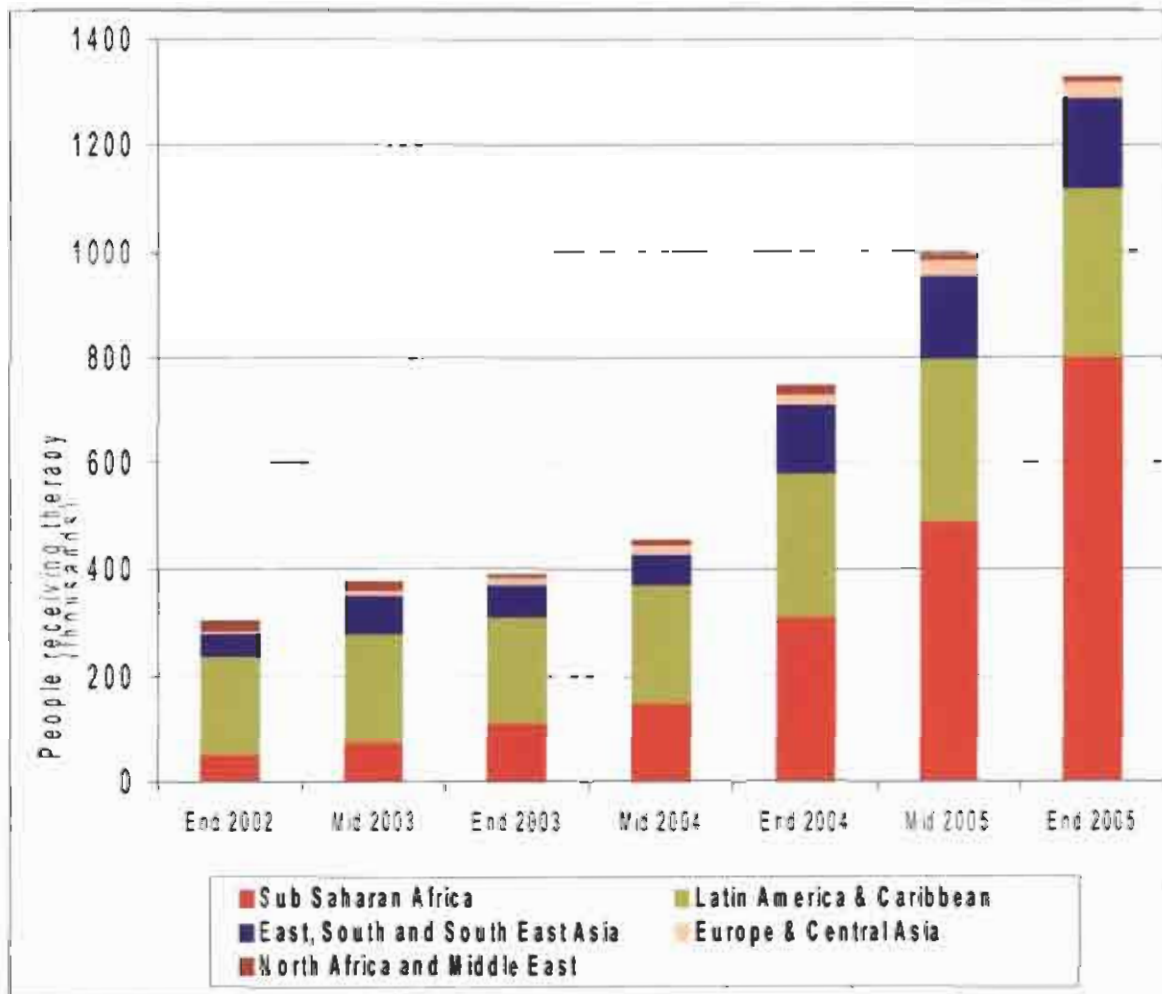


**Figure 2.6:** Interactions between medications and food/nutrition (FANTA, 2004)

In South Africa, 21 percent of 983,000 people in need of ARVs, are receiving antiretroviral treatment, a figure way below Botswana (85 percent) and Namibia (71 percent), as at 31<sup>st</sup> December, 2005 (Zarocostas, 2006).

The WHO “3 by 5” initiative which translates to the treatment of 3 million people by 2005 fell short of its target but resulted in antiretroviral drug treatment for 1.3 million people (Figure 2.7), preventing an estimated 250,000 to 350,000 deaths (Merson, 2006:2416-2417). Regardless of recent gains in treatment, only about one in five people

in low- and middle-income countries who need antiretroviral drugs are receiving them (Merson, 2006:2416-2417).



**Figure 2.7:** Number of people in low- and middle-income countries receiving antiretroviral-drug therapy, 2002-2005 (WHO/UNAIDS, 2006:152)

### 2.8 Health care sector, role of nutrition and nurses in South Africa

South Africa has a large public health sector as well as an extensive, well-established private sector (Van Rensburg, 2004:35-38). In South Africa, the public-private collaboration or partnerships have gained momentum as a model of health care provision and financing (Van Rensburg, 2004:37). The main thrust behind such collaboration is reciprocity to complement and strengthen the often lean resources and weak service delivery prevailing in either the private, or the public, or both sectors (Van Rensburg,

2004:37). This entails a means of making the best use of available resources for health by tapping the relative strengths of both private and public providers.

In 2003, the South African government indicated that there was an estimated 31 000 nursing staff shortage in the public sector alone, a situation which meant that one nurse overburdened by work (Padarath *et al.*, 2003). Table 2.3 further illustrates by province, posts that have been filled and those that are vacant in the public sector. Although the data reported in 2003 by the South African government is different from the data reported by the Health Systems Trust (2004) in Table 2.3, there is evidence of scarcity by at least 31 000 nurses. The nursing staff referred to in Table 2.3 is inclusive of the total nursing profession that comprises registered nurses and midwives (professional persons), general or psychiatric nurses, enrolled nurses and enrolled nursing auxiliaries or nursing assistants (Scarle, 2000).

**Table 2.3: Public health posts and vacancies (Health Systems Trust, 2004)**

PROVINCE	POSTS	POSTS FILLED	POSTS VACANT
Mpumalanga	19 018	6 201	12 817 (67.4%)
Free State	12 104	7 176	4 928 (40.7%)
North West	11 589	7 764	3 825 (33.0%)
Gauteng	32 873	22 375	10 498 (31.9%)
Eastern Cape	21 991	15 751	6 240 (28.4%)
KwaZulu-Natal	37 338	28 205	9 133 (24.5%)
Northern Cape	3 248	2 360	888 (27.3%)
Western Cape	15 401	13 268	2 133 (13.8%)
Limpopo	15 452	13 376	2 076 (13.4%)

South Africa	169 121	116 547	52 574 (31.1%)
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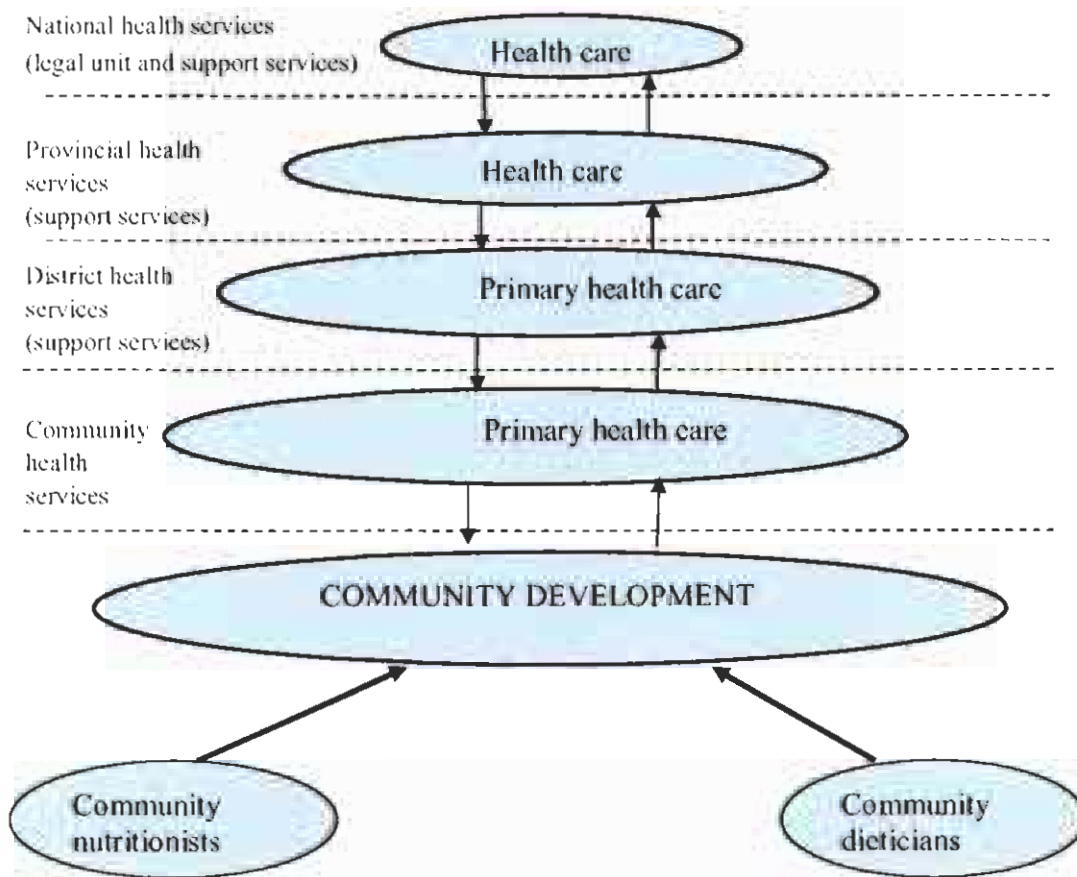
The registered or professional nurse according to Section 16 of the Nursing Act 50/1978 regulated and licensed by the South African Nursing Council (SANC), is a person that has a comprehensive four-year diploma or degree in general nursing, midwifery, community nursing, psychiatric nursing, clinical nursing science, health assessment, treatment and care (Van Rensburg, 2004:336). The general or psychiatric nurse is one that has a two-year diploma in general nursing (so-called bridging programme); whilst an enrolled nurse is one that has a two-year certificate; and lastly a one-year certificate for an enrolled auxiliary nurse (Van Rensburg, 2004:336).

Nurses provide the bulk of service provision in the public health sector where the emphasis is most striking at the primary care level (Van Rensburg, 2004:335-338). This entails that nurses and midwives are at the very heart of the effort to control HIV/AIDS. Within the health services, they are the first point of contact for PLWHA. In addition they are the staff members who bear the greatest responsibility for the on-going treatment and care as well as filling the gap in a system which lacks key health personnel (Van Rensburg, 2004:340). Hence, if nutrition education to counteract the nutritional impacts of HIV/AIDS and vice versa is to be successful, it must be based on some understanding of the existent perceptions of professional nurses regarding their ability to render nutritional care to PLWHA.

## 2.9 National Health System and Nursing in South Africa

The health system is seen as an institution of health service delivery to promote, protect or restore the health of individuals and populations (Van Rensburg, 2004:1). Through the primary health care (PHC) approach introduced to South Africa in 1994, registered nurses are the primary care givers at the community level involved in care, treatment, prevention and support of PLWHA. However PHC service delivery in South Africa is still seriously fragmented, disjointed, compartmentalised, duplicated and resource wasting (Van Rensburg, 2004:143). Hence, nursing has been embedded within the

structure of health (Figure 2.8) that is still a far cry from comprehensiveness that PHC stands for (Van Rensburg, 2004:339-340).



**Figure 2.8:** The national health system of South Africa modified with the inclusion of community nutritionists and community dietitians (Muller, 2001:85)

According to Figure 2.8, the **National level** of health is accountable for leadership, support, regulation and liaison. National health policy and legislation takes place here. The **Provincial level** is accountable for the protection, promotion and monitoring of health of the people within the province. Activities may differ from province to province but should be in line with National Health. At the **District level**, health care is delivered on the basis of the PHC approach. The community of whom the consumer forms part is the recipient of health care. It should also be noted that the number of nurses increases as we move from the national level to the community level.

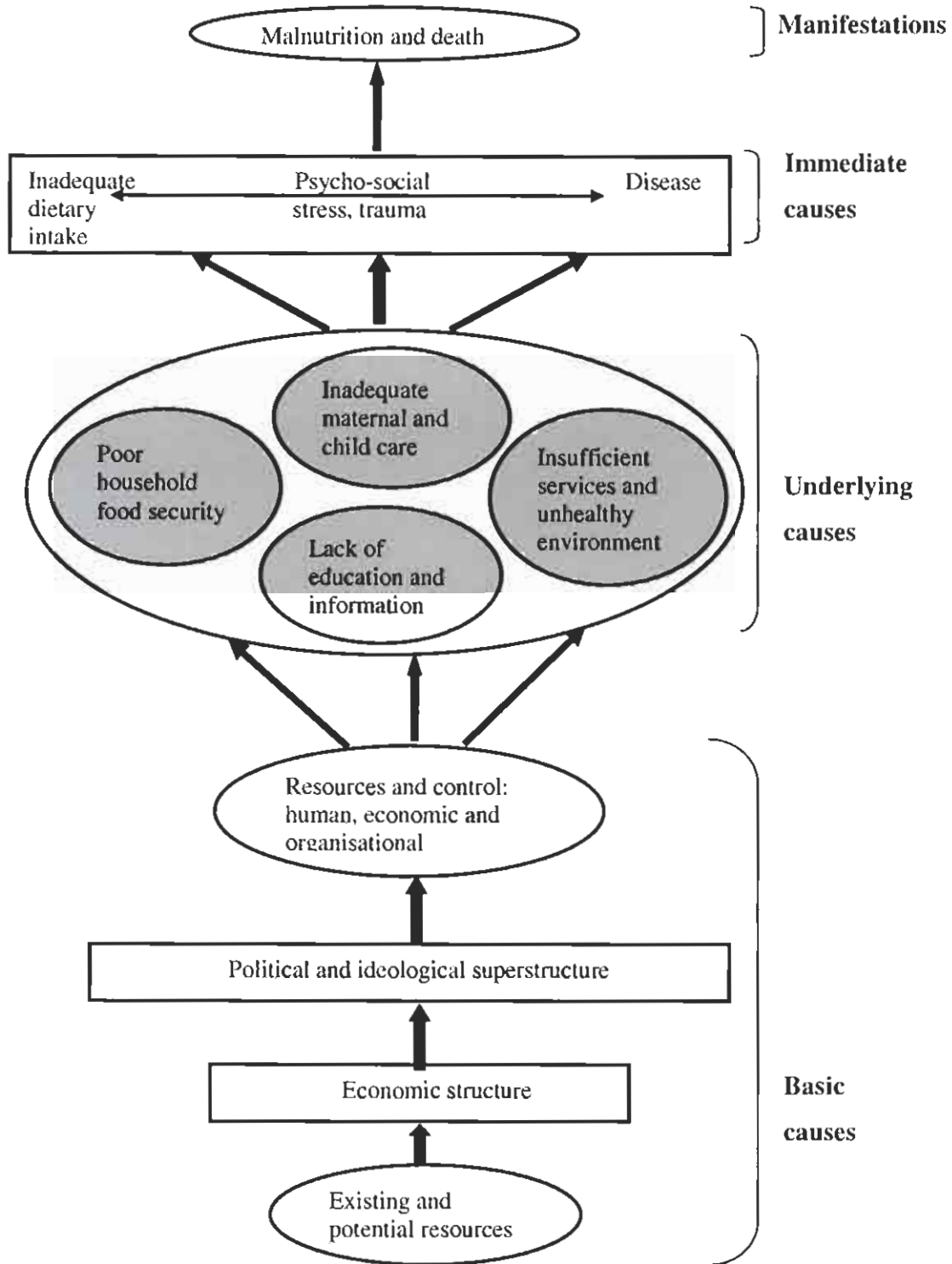
Private sector has a different structure as it employs its own nurses, and its main responsibility is to offer curative services (medical and surgical care).

The legal control of the nursing profession and its ethical norms and values has been greatly influenced by the medical profession (Searle, 2000:426). Nursing however has its own regulating body called the South African Nursing Council (SANC). There are other trade unions such as the Democratic Nursing Organisation of South Africa (DENOSA) and the Health and Other Service Personnel Trade Union of South Africa (HOSPERSA) whose sole responsibility is to look after the interests of nurses and workers in the workplace.

### ***2.9.1 Roles of community nutritionists***

Community nutrition refers to all food- and nutrition-related activities which lead to the promotion and improvement of the health of a given population living in a defined geographical area (Owen & Frankle, 1986:4-5; Wright & Sims, 1986:386). This incorporates the element of identification and suggesting possible solutions to health problems during the interaction of nutrition personnel and the community (Obert, 1986:7). Hence the community nutritionist is concerned with all the elements that affect nutritional health and the well-being of population groups (Figure 2.9).

The role of this group as well as dieticians has been included with the aim of exploring possible routes of forming effective partnerships across sectors based on the understanding of what each sector can offer in the fight against HIV/AIDS.



**Figure 2.9:** Conceptual framework of malnutrition (UNICEF as quoted by the Department of Health, South Africa 2004:1).

The UNICEF framework shows that causes of malnutrition are multisectoral, embracing food, health and caring practices. They are also classified as immediate, underlying, and basic causes, whereby factors at one level influence other levels. The framework is used at national, district and local levels, to help plan effective actions to improve nutrition. It serves as a guide in assessing and analysing the causes of the nutrition problem and helps in identifying the most appropriate mixture of actions.

In addition, community nutrition differs from other nutrition practice by its attention to people as they relate to the community and as they are affected by the community (Obert, 1986:7).

**2.9.2 Role of dieticians**

In essence dieticians apply the principles of food and nutrition to plan and supervise the preparation and serving of meals in institutions (public and private). They may also teach basic nutrition and diet modifications related to various diseases. Table 2.4 further summarises the roles of a community nutritionist and dietician.

**Table 2.4:** Roles of a community nutritionist and dietician

<u>Community nutritionist</u>	<u>Dietician</u>
⌘ Primary prevention of nutrition-related disorders	⌘ Secondary prevention of nutrition-related disorders
⌘ Aims to keep the public out of the hospital system (wellness paradigm) through quality nutrition education programmes, among other issues	⌘ Mostly institution based and works closely with medical staff (treatment paradigm)
⌘ Deals with the public at large	⌘ Deals and counsels individuals
⌘ Responsible for driving nutrition issues onto the political agenda	⌘ Specialises in therapeutic diets and meal planning

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An issue previously alluded to is a clear indication that the 2 000 dieticians and the unknown number of nutritionists may not be enough to fill up posts both within the public and private institutions in South Africa. However, the conceptual framework (Figure 2.9) undoubtedly shows the need for an integrated and holistic approach to addressing malnutrition, as there is no simple and single answer to this problem. Hence the need for collaborative efforts and effective partnerships across all sectors in improving the quality of life of PLWHA can not be overemphasized.

In light of the conceptual framework of malnutrition (Figure 2.9), the fight against HIV/AIDS-related nutritional problems should be coupled with the fight against poverty. From the preliminary discussions with professional nurses during the pilot study, there was a unanimous agreement on the fact that ARVs and good nutrition are not the only solutions to the disease, what is needed is a comprehensive approach that takes cognisance of and addresses poverty-related issues of infected and affected people.

### *2.9.3 Summary: Existing policies on nutrition and HIV/AIDS*

A policy can be thought of as a set of instructions from policy makers to policy implementers that spell out both goals and the means for achieving these goals. By definition, policy makers are people who occupy positions in the governmental arena that entitle them to authoritatively assign priorities and commit resources (Nakamura & Smallwood, 1980 as quoted by Denzin & Lincoln, 1994:548).

Policy should be based on best evidence available; hence the aim of this section is to give key highlights on some of the current existing policies on nutrition and HIV/AIDS.

**South African national guidelines** on nutrition for people living with TB, HIV/AIDS and other chronic debilitating conditions were produced in 2001 by the department of Health in conjunction with the United Nations Children's Fund (UNICEF). The guidelines acknowledge that malnutrition increases the rate of HIV progression to AIDS, whilst HIV/AIDS exacerbates the effect of malnutrition hence forming the vicious cycle.

The guidelines further state that a person living with HIV/AIDS has increased energy, protein needs and the importance of fruit and vegetable consumption over supplements in supporting the immune system. In addition this policy document brings out the comprehensive approach of tackling problems related to HIV/AIDS which include: food safety; personal hygiene, a clean and safe environment and dealing with the complications of HIV/AIDS. The guide does not cover issues around a typical food basket for a household living with people that are infected by HIV/AIDS. In addition it does not cover drug or herbal treatment practices, a crucial part in the advent of ARVs. Hence calling for the guidelines to be updated to practical terms and implemented accordingly.

**WHO/FAO** produced a policy document in 2002 entitled, *Living well with HIV/AIDS*; a manual on nutritional care and support for people living with HIV/AIDS. The guidelines place emphasis on the consumption of well-balanced diets so as to promote a sense of well-being and strengthening the resolve of the sick to get better. In addition the guidelines reiterate the fact that it is essential to meet the immediate food, nutrition and other basic needs if HIV/AIDS-affected households are to live with dignity and security. Apart from recommending a healthy and well-balanced diet for PLWHA the guidelines acknowledge the following in terms of meeting PLWHA's nutritional needs:

- ⌘ an increase in energy intake and;
- ⌘ an increase in vitamin and mineral intake (*although the guidelines state that micronutrient supplements can be useful but can not replace eating a balanced and healthy diet*).

**The Food and Nutrition Technical Assistance (FANTA)** project by the Office of Health and Nutrition of the Bureau for Global Field Support and Research at the United States Agency for International Development also produced a policy document in 2004. Its aim was to be a guide for the nutrition care and support in the context of HIV/AIDS. This guide makes an assumption that the majority of people may not know their HIV status, hence the food/diet messages included are appropriate to help all adults and

children lead healthier, more productive lives. The guidelines state the following requirements to meet the special needs of a person infected with the HI virus:

- ✂ 10 – 15 % additional energy intake
- ✂ 50 – 100 % increase in protein intake as compared to a non HIV-infected person
- ✂ Adequate amounts of micronutrients whose consumption can be increased through eating specific foods or through special supplements. This guide however, acknowledges that the impact of taking micronutrient supplements on HIV infection is not well known.

**The Food and Nutrition Technical Assistance (FANTA)** project produced another technical note in 2004 on the food and nutrition implications of antiretroviral therapy in resource limited settings. The technical note accepts the fact that individuals infected with HIV have special nutritional needs, such as increased energy requirements, irrespective of whether they use ART. In addition, it acknowledges the fact that although access to ART in developing countries is expanding; the majority of PLWHA still do not have access to ART. The technical note states the following requirements to meet the nutritional needs of PLWHA:

- ✂ 10 % increase in energy intake for asymptomatic PLWHA over the requirement for healthy, non-HIV-infected persons of the same age, sex and physical activity level;
- ✂ 20 – 30 % increase in energy intake for the symptomatic PLWHA over the requirement for healthy, non-HIV-infected persons of the same age, sex and physical activity level and;
- ✂ the same protein and micronutrient recommendations for healthy, non-HIV-infected persons of the same age, sex and physical activity.

The technical note recognises that ART can reduce viral loads and contribute to improved nutritional status, and it also describes in detail possible nutrient-drug complications.

**The World Health Organisation (WHO, 2005)** currently recommends the following increased energy intake:

- ✂ 10 % more energy for HIV+ without symptoms

- ⌘ 20-30 % more energy for HIV+ with symptoms
- ⌘ 50-100 % more energy for HIV+ children with weight loss.

WHO further recommends that protein intake should be maintained at normal levels such that:

- ⌘ 12-15 % of total energy intake is from protein sources.

#### **2.9.4 Conclusion**

In essence, the policy documents outlined above all state that there is a vicious cycle between nutrition and HIV/AIDS as this is also supported in the review of literature which focused mostly on the role of micronutrients in HIV infection and disease progression. Furthermore, there is no cure for HIV/AIDS, hence nutrition being a critical component of care can only improve and maintain a good quality of life of those infected with HIV.

## CHAPTER 3

### RESEARCH METHODOLOGY

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*The researcher is both an observer of the social world and a part of that same world (Gibbs, 2002:165).*

#### 3.1 Introduction

Professional nurses occupy a central role in influencing the health and possibly nutrition habits of people based on the fact that they have a greater contact with the public on a daily basis in comparison with other professions (Van Rensburg, 2004:335). The previous chapter dealt with a review of literature on the relationship between nutrition and HIV/AIDS. It also included information from existing nutrition and HIV/AIDS policies, which is a key feature in forming a firm foundation for implementation. This chapter entails a detailed description of the theory supporting this study as well as an insight into the research design and method.

#### 3.2 Qualitative inquiry

The main methods used in qualitative inquiry are *ethnography*, *phenomenology* and *grounded theory* (Mayan, 2001:7). *Ethnography* was developed by anthropologists in the late nineteenth century so as to understand people's cultures by immersing themselves in a group's setting to learn more about the culture of that group (Mayan, 2001:8). In addition to foreign culture, ethnographers also study specific groups of people as found in businesses, organisations, subcultures, or ethnic populations (Mayan, 2001:8). Ethnographers use an array of data collection strategies including participant observation, interviews and fieldnotes. Various data sources may be used such as recording, documents, diaries, poetry, art or significant cultural artifacts.

*Phenomenology* was developed by Husserl in the late nineteenth century. Its goal is to study and describe the essence of the lived human experience. Phenomenologists collect data by way of interviews, diaries, journals, poetry and art for insight into the human

experience. The end product is a thick description of the meaning or the essence of the phenomenon in question (Mayan, 2001:9).

*Grounded theory* was originally developed by two sociologists, Barney Glaser and Anselm Strauss in 1967 (Willig, 2001:32). They believed that theories must be induced from the data, and as the name implies, this method is used to develop theories that are grounded in the data (Mayan, 2001:9). Grounded theory was chosen for this study because of its relevance and applicability to the area of interest. The following section explores the philosophy of grounded theory in detail.

### **3.2.1 Grounded theory**

Strauss and Corbin (1990:5) define grounded theory as a general methodology for developing theory that is grounded in data systematically gathered and analysed so that new theories would emerge. In addition such theories would be specific to the context in which they had been developed rather than rely on analytical constructs, categories or to open up space for the development of new, contextualised theories (Willig, 2001:32). Sources of data include: interviews, field observations, participant observations, videotapes, documents of all kinds such as diaries, autobiographies, newspapers and other media materials (Denzin & Lincoln, 1994:24). Grounded theory requires that interpretations and perspectives become incorporated into our own interpretations; a process called conceptualisation (Denzin & Lincoln, 1994:26). Grounded theory can also be relevant and possibly influential either to the understanding of policy makers or to their direct action (Strauss & Corbin, 1990:5). Hence this theory is relevant to this study as the researcher's aim is to understand professional nurses' perception of their ability to render effective nutritional care for PLWHA. According to Gibbs (2002:165) analysis in grounded theory can be divided into three stages:

- x **open coding**, where the text is read reflectively to identify relevant categories;
- x **axial coding**, where categories are refined, developed and related or interconnected and;
- x **selective coding**, where the core or central category that ties all other categories in the theory together into a story, is identified and related to other categories.

Coding in general constitutes the most basic as well as the most fundamental process in grounded theory (Willig, 2001:38). Willig further illustrates that coding can be carried out line-by-line, sentence-by-sentence, paragraph-by-paragraph, page-by-page, section-by-section, and so on.

For the purpose of this study grounded theory was used as the foundation, as it involves the progressive identification and integration of categories of meaning from data (Willig, 2001:33). Willig further states that grounded theory as *theory* is the end-product of the process, provides an explanatory framework with which to understand the phenomenon under investigation. For this study the researcher was aiming to understand professional nurses' perception of their ability to render effective nutritional care for PLWA. Furthermore, in grounded theory, the researcher interacts with the data (Willig, 2001:35).

### **3.3 Research design**

A qualitative approach was followed in the exploration and understanding of nurses' perception of their ability to render effective nutritional care to PLWHA.

### **3.4 Methodology**

#### **3.4.1 Setting**

Purposive sampling which implies sampling with a purpose in mind (Creswell, 1998:118) was used to select all hospitals providing ARVs in North West Province based on the following criterion adopted from Glesne and Peshkin (1992:24):

8 would the hospitals agree to participate in the study?

Purposive sampling was ideal in this study as it ensured that the targeted population was reached quickly. Sampling proportionality was not the primary concern. Furthermore, there were 11 hospitals in North West Province providing ARVs, however for this study only eight hospitals participated as the other three hospitals mentioned critical staff shortages and time constraints as main reasons for non-participation.

### 3.4.2 Participants

- x Twenty three nurses registered with the South African Nursing Council also known as professional nurses working at the primary health care (PHC) level and in home based care (HBC) in eight hospitals providing ARVs in North West Province were purposefully selected (*sample size was decided by hospital participation although three hospitals did not participate, at least two nurses per hospital that gave their own consent were interviewed*).

### 3.4.3 Tools

A semi-structured questionnaire was used for interviews as well as during focus group discussions and consisted of the following parts:

- x demography,
- x open-ended and closed questions for understanding and exploring perceptions of professional nurses' regarding their ability to render nutritional care to PLWHA.

According to Mayan (2001:15) semi-structured interviewing is used when the researcher knows something about the area of interest, but not enough to know the answers to the questions that are to be asked. Although the questions are set, participants can answer freely in contrast to a close-ended questionnaire in which predetermined answers must be chosen (Mayan, 2001:16). In addition, a focus group strategy was used mostly to collect data on a particular area of interest within a relatively short period of time as well as to observe the interaction between participants which is an integral part of the meaning of the data (Mayan, 2001:18). For this particular study, a focus group discussion was done at one hospital for the reason that time was a constraint for the participants and they were only three nurses responsible for PLWHA in the hospital. The focus group discussion was done during the participants' tea-break. The researcher conducted interviews mostly in English, and where necessary a translator was recruited to translate questions into a language that was understood by the participants. All interviews were recorded on an audio digital-recorder and were transcribed. It should also be noted that one-on-one interviews were done when there were more than three nurses in each unit such that there would always be a nurse attending to patients in the wards whilst the interviews were

proceeding. Participants' responses (transcripts) were then open-coded and grouped into categories by two independent researchers using the software NVivo.

#### ***3.4.4 Questionnaire formulation***

Having conducted a literature review and drawing upon one's experience, the author prepared open-ended questions in advance of the interviews. The research questions for the questionnaire were formulated around the purpose statement which is:

*To understand and describe perceptions of registered nurses regarding their ability to render effective nutritional care to PLWHA*

This purpose statement eventually formed signposts for explaining the intention of the study and guiding the whole research (Creswell, 1994:3). The author employed the following steps in formulating questions for the study:

- x having well-defined objectives;
- x determining categories of information required (e.g. background/demography, experience, opinion/perception);
- x deciding on the types of questions (e.g. open-ended or closed questions);
- x adapting where necessary existing reliable questionnaires;
- x setting up as many questions as possible with the intention of selecting the best later;
- x adding follow-up, probing and confirmatory questions;
- x shortening and making questions more precise;
- x testing each question with the following in mind: why asked? Aim? What will be achieved by it?
- x conversation with statistical consultant as well as other experts in questionnaire formulation;
- x determining the order of questions;
- x pilot testing questionnaire and;
- x questions were initially formulated by researcher then improved with inputs and comments from the rest of the team.

In general the number of main questions was six (Table 3.1, with follow-up questions). According to Mayan (2001:16) the number of questions asked should be minimal to avoid interrupting the flow of the interview. In addition to this, the author also attended a workshop *on designing a questionnaire and how to work closely with the Statistical Consultation Service* of the North West University (Potchefstroom Campus) before commencing the study.

**Table 3.1:** Semi-structured interview questions used in qualitative interviews with registered nurses

- 
1. What are your daily experiences as a nurse dealing with HIV/AIDS? (*ice-breaker question*)
  2. What questions are you constantly asked by PLWHA in your hospital? (*transition question*)
  3. When PLWHA come for routine care, do you talk about eating healthy food? (*transition question*)
  4. What do you say are the skills required by you a professional nurse to render effective nutritional care and support to PLWHA? (*skill question*)
  5. On a scale of 1-5 (1: very bad, 2: bad, 3: average, 4: good, 5: very good) what do you say is your own level of skill to render quality nutritional care and support to PLWHA? (*perception and ability question*)
  6. Have you seen and read the South African Nutritional Guidelines on the Nutritional Care for People Living with TB, HIV/AIDS and other Chronic Debilitating Conditions? (*diffusion question*)
- 

The following questions (Box 1) have been expanded so as to show areas of further probing. It should be noted that the interview schedule was based mostly on the 6 main questions as outlined above (Table 3.1) and interviewee responses were unique in the sense that different issues came up however it was the responsibility of the interviewer to keep all discussions on track so as to reach the desired goal. An example of a transcribed interview from the field is further illustrated in Appendix 1.

**Box 1: Further illustrations on the interview schedule**

**1. What are some of the challenges you are facing as a nurse dealing with HIV/AIDS on a daily basis? (ice-breaker)**

*a) When they start receiving ARVs, isn't there some intensive training done before? (follow up question)*

*b) The women who are falling pregnant are they aware of the consequences? (follow up question)*

*c) Do you ever visit these support groups just to hear what they are talking about? (follow up question)*

*d) How many clients are you seeing per day? (transition question)*

**2. What questions are you mostly asked about by your patients? (transition question)**

**3. Do you talk about healthy eating or nutrition with your patients? (transition question)**

*a) In cases where the dietician is not around, what are you telling them then? (follow up question)*

*b) Do you feel confident to talk about nutrition? (follow up question)*

**4. What skills do you think are needed by a nurse to render effective nutritional care to PLWHA? (skill question)**

**5. Where would you place yourself in terms of the skills you have to render effective nutritional care to PLWHA (1: very bad; 2: bad; 3: average; 4: good; 5: very good)? (perception and skills question)**

*a) Where do you think you need to improve on? (follow up question)*

*b) What do you think is needed to ensure that patients adhere to treatment? (follow up question)*

*c) Don't the people on treatment have treatment supporters? (follow up question)*

**6. Have you seen and/or read the nutritional guidelines on the nutritional care for people living with TB, HIV/AIDS & other chronic debilitating conditions? (diffusion question)**

*a) Suppose I am HIV-positive, what would you advice me to have in my food basket every month? (follow up question)*

**7. What would you like to do better in the area of HIV/AIDS and nutrition? (closing question)**

### 3.5 Open-coding and NVivo

The author imported the transcribed data from Microsoft Word into NVivo as rich text format (.rtf). The data was coded sentence-by-sentence and also question-by-question into themes also known as nodes. These nodes were grouped into categories and used to show relations amongst them. According to Creswell (1994:154) and Rubin & Rubin (1995:238), open coding is a process of assembling together similar ideas, concepts or themes. The method of coding was done by two independent researchers, however it should be noted that the author transcribed the data first and then shared it with the independent co-coder. Further deliberations were done to reach consensus on emerging themes/nodes and this was mostly agreeing on the same terminology. It should be noted that the themes were the same except for terminology that would have been used e.g. low socio-economic status and poverty-stricken.

### 3.6 Pilot Study

Before the final semi-structured questionnaire was administered to the purposefully selected registered nurses the following steps were performed:

- ⌘ The interview schedule was submitted to experts (Departments of Nutrition and Psychology, North West University, Potchefstroom Campus) for evaluation and adjusted accordingly,
- ⌘ The pilot study was done over two days to test the interview schedule and determine the feasibility of the study interviewing four nurses at Steve Tswete clinic in Potchefstroom.

According to Royse (1995:172) the purpose of a pilot study is to determine whether the relevant data can be obtained from the respondents. Denzin and Lincoln (1994:213) state that the pilot study in qualitative research allows the researcher to focus on specific areas (e.g. instructions) that may have been unclear previously, or to test certain questions. The pilot study assists moreover in estimating the time and costs that may be involved, as well as in pre-empting the problems that may arise during the actual qualitative interviews (Denzin & Lincoln, 1994:213). Pallant

(2005:5) states that pilot-testing a questionnaire also picks up any questions that are leading or items that may offend potential respondents.

### **3.7 Participant observation**

The author immersed herself at a local clinic doing voluntary work so as to gain an inside perspective of the setting. Voluntary work included mostly photocopying and filing. During that period the author was able to observe participants without interfering with their work. Mayan (2001:12) states that participant observation can be used to access information that is otherwise unavailable. In addition participating in the setting, the researcher gains awareness through personal experience by getting to know the people involved and observing it all (Mayan 2001:12).

### **3.8 Data organisation and statistical analysis**

Mayan (2001:21) states that the qualitative researcher collects data, analyzes it, collects more data to fill in gaps, analyses it, collects more data, and so on to reach saturation which may lead to huge quantities of information being handled by the researcher. In this study the computer software packages NVivo and Statistical Package for Social Sciences for Windows (version 14, 2005, SPSS Inc., Chicago, IL) were used for data packaging and analysis. NVivo was used for organising large quantities of data into manageable information through the use of open-coding, grouping data into categories and establishing relationships among categories or themes. In addition, the design of NVivo was strongly influenced by grounded theory and therefore the program gives good support for the method (Gibbs, 2002:165). SPSS was used for descriptive statistics, which mostly included calculation of frequencies and means. Literature, mostly Nutrition and HIV/AIDS policy documents mentioned in section 2.9.3 in Chapter 2, was adopted to further analyse data obtained, providing a foundation for the research and highlighting new insights gained from the study. The data was checked and supplemented by visits to HIV/AIDS support groups, clinics and hospitals. Verbatim quotations were documented as part of the process. Where necessary, follow-up and verification were done by the researcher to ensure trustworthiness of data obtained further explained in section 3.8.1. In addition, verification of data was done by means of telephone conversations or personal

visits to the hospitals and/or clinics after the first interviews. In addition this study included two levels of research: literature searches and interviews with participants.

### ***3.8.1 Trustworthiness and rigour***

Lincoln and Guba (1985:290) define trustworthiness as a process done by the inquirer in persuading his or her audiences (including self) that the findings of an inquiry are worth paying attention to, and worth taking account of. Hence, the research is said to be trustworthy if it is conducted in such a way that ensures strictness and accuracy when presenting the participant's perceptions (Krefting, 1991:220). The trustworthiness of this research was ensured by the achievement of criteria identified by (Krefting, 1991:220) as shown in Table 3.2.

Mayan (2001:26) states that to ensure that research is rigorous there is a need to focus on verification during the study. The author further defines verification as a process of checking, confirming, making sure and being certain so as to identify and correct threats to reliability and validity as they surface. Verification strategies include investigator responsiveness, methodological coherence, sampling, data analysis and thinking theoretically (Mayan, 2001:26). The author continues by stating that these built-in strategies help the researcher identify when to continue, stop or modify the research in order to achieve reliability, validity and ensure rigor.

This model is recommended for qualitative research and it ensures the rigour of the research without compromising its relevance. Lincoln and Guba (1985:290) base trustworthiness of qualitative research on: *truth value, applicability, consistency and neutrality*. All these concepts are supported by results from the study in Chapter 4 and in Table 3.2 which shows how the set criteria of ensuring trustworthiness were met.

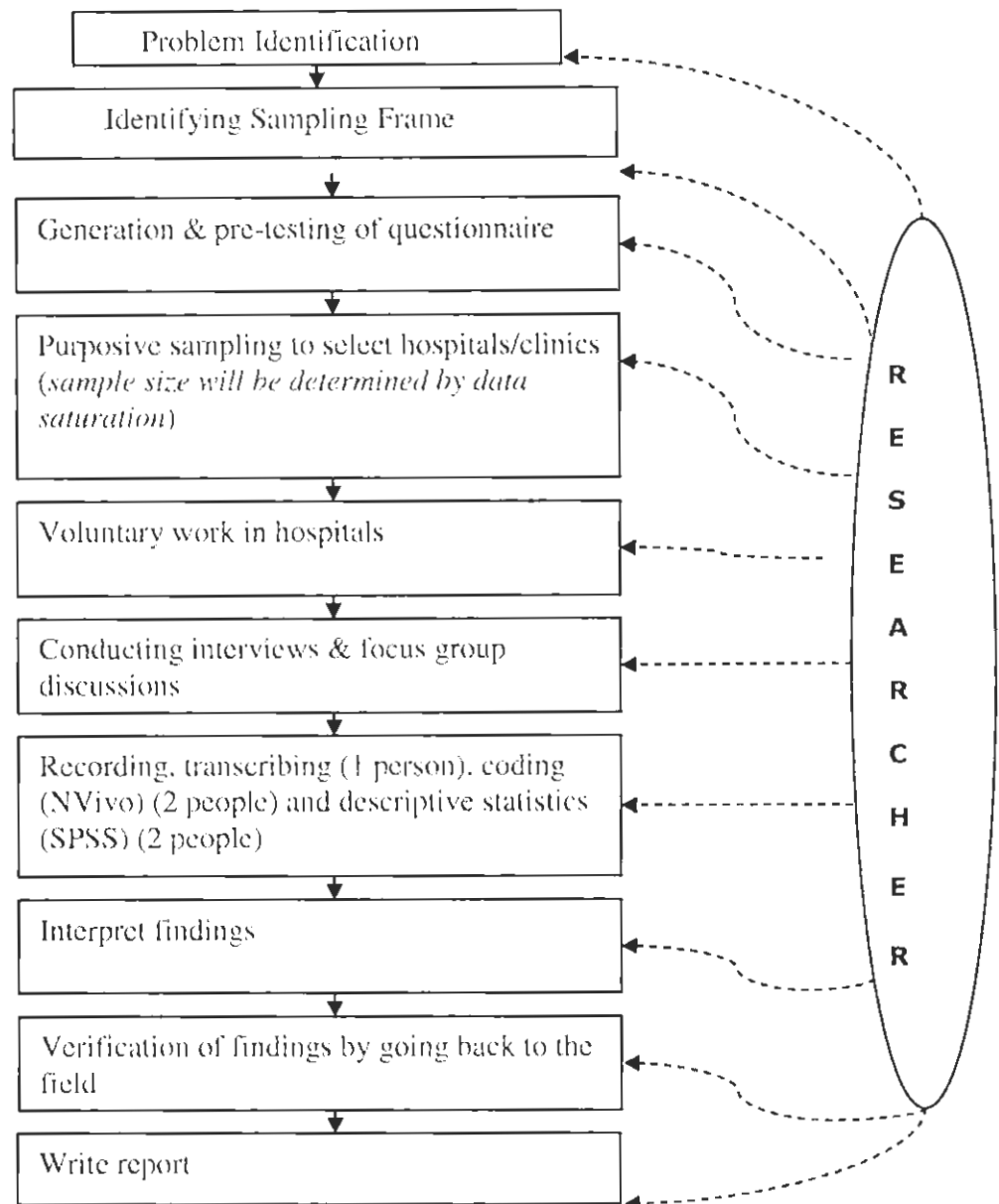
**Table 3.2:** Strategies of ensuring trustworthiness in the study and how they were met  
(adopted from Krefting, 1991:220)

Strategy	Criteria	How criteria was met
Credibility	<ul style="list-style-type: none"> <li>⌘ Field experience</li> <li>⌘ Triangulation</li> <li>⌘ Interview technique</li> <li>⌘ Verification</li> </ul>	<ul style="list-style-type: none"> <li>⌘ Exposure to field (~8 months prior to data collection) and conducting of pilot study</li> <li>⌘ Building a trust relationship with participants</li> <li>⌘ Auditing interviews with independent people</li> <li>⌘ Open discussion guided by semi-structured questions</li> <li>⌘ Audio-recording and taking of field notes after interview</li> <li>⌘ In-depth description of methodology and results , which are accompanied by verbatim quotations</li> </ul>
Transferability	<ul style="list-style-type: none"> <li>⌘ Sample selection</li> </ul>	<ul style="list-style-type: none"> <li>⌘ Use of purposive sample, set selection criteria, building rapport with participants and explaining value of their participation</li> </ul>
Dependability	<ul style="list-style-type: none"> <li>⌘ Application to other situations</li> </ul>	<ul style="list-style-type: none"> <li>⌘ Dense description of data collection and analysis</li> <li>⌘ Triangulation</li> <li>⌘ Peer examination</li> <li>⌘ Independent coding and comparison of codes</li> </ul>
Neutrality	<ul style="list-style-type: none"> <li>⌘ Auditability to increase reliability and neutrality</li> </ul>	<ul style="list-style-type: none"> <li>⌘ Auditing interviews, field notes, raw data and keeping records for peer review</li> </ul>

### 3.8.2 Role of researcher/author

In addition to writing the protocol for the study, the author was responsible for seeking permission from the Ethics Committee of North West University (reference number 06K13) and the Provincial Health team of the North West Province (Appendix 2). The purpose and importance of the research were explained through the protocol; a copy of the approval letter from the Ethics Committee was also submitted. Regular telephone conversations were made between the author and some of the members of the Provincial Health team in relation to the study. The author was responsible for all initial contacts with the hospitals and professional/registered nurses (referred to as *participants*) that had been purposefully sampled for the study. Glesne and Peshkin (1992:xi) state that it is inappropriate to use the term *subject* in qualitative research as it implies *acting on* rather than *interacting with*, which at best characterizes the aim of the study. Following this, the researcher made appointments with participants to ensure that ethical issues and concerns were respected throughout the study. In addition participants gave their informed consent by word of mouth. All interviews were treated with utmost confidentiality and code names were used. Figure 3.1 provides a further illustration of the roles of the researcher.

It might be worthwhile to mention that the researcher also had extensive experience with qualitative methods as well as three years practical experience in the area of interest i.e. HIV/AIDS and nutrition indicating that the researcher had the appropriate knowledge and expertise to conduct the study.



**Figure 3.1:** Steps in the study design encompassing the roles of the researcher adapted from Kruger & Gericke (2004)

### 3.8.3 Gaining access to health institutions

Glesne and Peshkin (1992:33) define gaining access as a process that refers to the acquisition of consent to go wherever the researcher wants including the following: observing, talking to participants, obtaining and reading whatever documents the researcher may require and pursuing all of these activities for whatever period of time is

needed to satisfy the research purposes. In this study the researcher first made the initial contacts with the relevant personnel from the School of Nursing (North West University – Potchefstroom Campus) for their initial thoughts and reactions as well as giving the researcher an insight into the South African nursing structure. Following this, the researcher then made contact with the person from Knowledge Management of the Provincial Directorate of Health in North West Province for their consent and negotiating the conditions of access. Initially there were different decision-makers, which made the process of gaining access complex, but eventually permission was rendered to commence the study. In addition the researcher had to contact the relevant health institutions and this included presenting the cover story, listening and responding to concerns, demands and clarifying overarching issues to the hospital managers and participants. This process of gaining access took approximately three months.

### ***3.9 Conclusion***

In conclusion, this chapter dealt with the research design, an insight into the grounded theory, methodology and role of the researcher as well as ethical considerations of the study. Results are presented in the following chapter and discussion of results follows thereafter.

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**CHAPTER 4****RESULTS AND DISCUSSION**

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*"We must keep AIDS at the top of our political and practical agenda", Secretary-General Kofi Annan's message on the occasion of World AIDS Day (observed 1 December: - Dated November 17, 2003).*

**4.1 Introduction**

The previous chapter dealt with the research design and methodology of the study. This chapter gives an overview of the results with the inclusion of verbatim quotations where applicable. Descriptive statistics were used to calculate frequencies and means.

**4.2 Socio-demographic profile and hospital characteristics**

The mean age of nurses interviewed was 38 years (ranging from 26 to 59 years old) and 19 (83%) were professional nurses, three (13%) were enrolled and one (4%) was an enrolled nursing auxiliary. All the eight hospitals that participated in this study were public institutions, seven (83%) having been accredited to give out antiretroviral therapy and one (17%) hospital was still in the process of being accredited. The three hospitals that could not participate because of time constraints and shortage of staff had also been accredited to give out ART. Five (63%) of the hospitals were based in the rural areas and the remaining three (38%) were situated in urban areas. Of all the participants interviewed six (26%) had been practicing in the area of nursing for more than 16 years whilst the other six (26%) had worked as nurses for a period of 11-15 years. Table 4.1 outlines the other demographic information of the nurses in more detail:

**Table 4.1:** Demographic information of nurses interviewed

Characteristics	Percentage distribution	Number of participants
<b>Category of nurses</b>		
Professional nurses	83	19
Enrolled nurses	13	3
Enrolled auxiliary nurses	4	1
<b>Qualifications</b>		
Degree in nursing	35	8
Diploma in nursing	52	12
Certificate in nursing	13	3
<b>Qualification obtained at</b>		
University	39	9
College	61	14
<b>Years of service</b>		
1-5 yrs	17	4
6-10yrs	30	7
11-15yrs	26	6
16+ yrs	26	6
<b>Gender</b>		
Female	91	21
Male	9	2
<b>Trade Union</b>		
Belongs to a trade union	83	19
Belongs to none	17	4

### 4.3 Emerging issues

Five main themes (previously guided by the interview questions) emerged during the analysis of data and these portrayed nurses' perceptions regarding their ability to render effective nutritional care to PLWHA. The themes were as follows:

- ⌘ daily challenges faced by nurses in the context of HIV/AIDS;
- ⌘ concerns of PLWHA relating to HIV disease progression, access to treatment, side effects, disclosure and eligibility to social grants;

- ⌘ nurses' perception regarding the importance of nutritional care in HIV/AIDS;
- ⌘ nurses' perceived ability to deal with the nutritional care of PLWHA and;
- ⌘ traditional healers and their role in the context of HIV/AIDS.

**4.3.1 Daily challenges faced by nurses in the context of HIV/AIDS**

When participants were asked about their daily experiences in relation to HIV/AIDS, seven sub-themes emerged (Table 4.2) and are discussed thereafter.

**Table 4.2:** Participants' daily challenges in the context of HIV/AIDS

Major theme	Sub-themes	Number of participants
Daily challenges	Poor socio-economic status of patients on ART	8 (35%)
	Emotional drain and overwork	4 (17%)
	Disclosure	3 (13%)
	Patients on ART also taking traditional medicines	3 (13%)
	Access to social grants by PLWHA	2 (9%)
	Treatment defaulters and unhealthy lifestyles	2 (9%)
	Increase in number of HIV+ pregnant women	1 (4%)

*a) Poor socio-economic status of patients on ART*

According to Fenton (2004), at the global level there is a positive correlation between HIV prevalence and poverty, whether this is measured by gross domestic product per person, income inequality or Human Poverty Index. Aranda-Naranjo (2004) further states that many individuals who are newly diagnosed with HIV struggle with psychosocial influences such as poverty, stigma and discrimination which can affect their quality of life and motivation to stay on ART. Another study done by Kalichman *et al.* (2006) in three South African communities comprising of (1) *people living in an impoverished African township*; (2) *an economically impoverished but well infrastructured racially integrating township*; and (3) *urban non-impooverished neighborhoods* found that HIV/AIDS risks were closely related to poor education, unemployment, discrimination, violence, and crime. According to Table 4.2, eight (35%) participants cited their patients'

low socio-economic status as a challenge to them; some of the statements indicative of this from the participants were as follows:

*"The biggest challenge is poverty, as most of our patients are very poor. If you want your patient to adhere to treatment it means that they should have good nutrition and you can't just give patients treatment without food".*

*"Another thing is the low socio-economic status. For nutrition, it is a challenge as they are not getting the right nutrition they are supposed to be getting".*

*"Mothers will be telling you that they do not have money to buy food for their babies, and most of the babies are malnourished either marasmic or kwarshiorkor".*

*"The challenges we are facing is that there are defaulters, those that are not taking treatment because of social constraints, financial problems, as some of them are not working and do not have money to come and collect the treatment".*

*"The challenges I'm facing are that the patients that I deal with, when you look at their socio-economic background, it's very difficult for them to come for treatment, bearing in mind the issue of money for transport, money to buy food as they can't take the treatment on an empty stomach".*

*"Most families cannot afford the balanced diet thereby posing a great challenge to administration of ARVs".*

*"But many patients don't have money to buy the required foods".*

These statements show that the challenges faced by participants on a daily basis such as patients not accessing treatment and proper nutrition are because of their low socio-economic status. This negatively impacts on the component of care, treatment and adequate health care provision to PLWHA. In conclusion, poverty plays a role in creating

an environment in which individuals are particularly susceptible and vulnerable to HIV/AIDS, poverty reduction should undoubtedly be at the core of a sustainable solution to HIV/AIDS.

*b) Emotional drain and workload of nurses*

The challenges faced by nurses indicate that the HIV/AIDS epidemic has an impact on the health system through loss of staff due to absenteeism, low staff morale and also through the increased burden of patient load. It was found that four (17%) participants had low staff morale due to several factors including stressful working conditions, heavy patient workload, staff shortages and low salaries. Statements indicative of this were as follows:

*“It affects seeing so many patients per day; we also need to be counselled, to see the social worker and the psychologist but that does not happen. I have been counselling as of 2000, since working with HIV and AIDS patients I’ve never been counselled and we’re affected because we are nursing the patients that are infected but no one is taking care of us”.*

*“Another challenge is time for us to breathe, I’ve just had my tea now at 11 a.m. and it was supposed to be at 9 a.m. We don’t have time to leave them waiting as they are just coming in numbers”.*

*“Sometimes you’ll be emotionally hurt, because the patients are dying and do have some problems and when they start talking about their backgrounds, sometimes I get depressed”.*

*“Ok, the challenges I’m facing is really about (PAUSE), let me just say, shortage of staff. I’m working on the premises alone with only the enrolled nurse”.*

All of these statements are supported by data from the National Survey of Health Personnel, ambulatory and hospitalized patients and health facilities done in 2002 in

South Africa. The results showed that HIV/AIDS had a physical and mental impact on nurses, which was caused by operational matters in their work environment as well as taking care of patients (South African Department of Health, 2002:65). The following statement supports this:

*“Unfortunately, I am not motivated to come to work the following day because of the emotional strain, but there is nothing that I can do”.*

Muller (2001:128) has shown that the daily routine in the nursing unit is affected by the number of patients who require certain services, as well as patient turnover for the day. Table 4.3 shows that five hospitals (65%) reported seeing more than 50 PLWHA on a daily basis whilst the remaining three hospitals (35%) attended to less than 50 patients per day. The table further includes information regarding certain characteristics of the hospitals that participated.

**Table 4.3: Information of hospitals that participated**

	Percentage distribution	Number of hospitals
<b>Type of institution</b>		
Public	100	8
Private	0	0
<b>Hospital set up</b>		
Rural	57	5
Urban	44	3
<b>Hospital accredited to provide ART</b>		
Yes	83	7
Not yet	17	1
<b>Number of clients seen per day</b>		
<50	35	3
>50	65	5

Participants that mentioned emotional strain and overwork as a challenge further indicated that they experienced stress, fear and depression due to their contact with

PLWHA. However, on the other hand, the participants expressed sympathy and empathy towards patients because of their physical and mental suffering.

*c) Disclosure of status by PLWHA*

Coping with illness and disclosure by PLWHA inevitably emerged as a challenge to three (13%) participants that were interviewed. Ateka (2005) reported that HIV status is further complicated by the phenomenon of partner discordance (a situation whereby one partner is HIV positive and the other is not), which makes disclosure to sexual partners much more difficult. Furthermore stating that HIV status disclosure to partners was associated with a breakdown in social support. In contrast, Abadia-Barrero (2006) found that universal access to HAART in Brazil was a powerful intervention that reduced stigma, encouraged status disclosure and social support, as HAART transformed AIDS from a debilitating and fatal disease to a chronic and manageable one. However, according to Duffy (2005) HIV/AIDS, especially in the context of poverty, results in considerable suffering. Duffy (2005) did an ethnographic study in rural Zimbabwe on eleven HIV positive women and key informants (such as nurses and teachers) so as to examine factors that facilitate or hinder women's ability to prevent HIV. The author found that stigmatisation is a major influence in treatment and care of ill persons and groups for the reason that it strongly relates to the way persons are viewed within their communities. In the end the stigma, discrimination and resulting isolation means that people do not easily if ever, disclose their status. In this study, supportive statements indicative of this included:

*"They say they are being discriminated at home".*

*"Some of the patients do not want to disclose their status".*

*"The problem of disclosure and stigmatisation, not accepting the status and others not telling their spouses that they are on treatment or even talk about their HIV status".*

Duffy (2005) states that tearing down walls of misunderstanding, fear, stigma and discrimination must be part of any health promotion effort, while building supportive environments that eliminate unnecessary suffering from AIDS. Furthermore, the General Medical Council (GMC) of the United Kingdom recommend that every effort should be made to persuade the infected person to inform their sexual partner, but if they decline, then the health worker, if there is a serious and identifiable risk to this other person, is justified in disclosing the information (Woodward and Argent, 2002). However, the South African Department of Health (2002:65) stated that HIV/AIDS is not a notifiable disease and that it is not necessary for patients to make their HIV status known to health workers or for health workers to notify their patients of their status. The Department of Health further argued that stigma is attached to HIV/AIDS because those that are HIV positive usually do not want to make their status known. In conclusion, the participants that cited disclosure as a challenge mentioned that for treatment to be effective there is need for social support (such as treatment support group and supporters) especially from the family and community.

*d) Mixing of ARVs with traditional medicine*

Traditional medicine is referred to as health practices, approaches, knowledge and beliefs incorporating plant, animal and/or mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness (WHO, 2005:1). In South Africa, traditional healers have been identified as health care practitioners of choice for 80-90% of the black population (Karim *et al.*, 1994:2). According to Fulder (1985), when patients get no help from using biomedical treatment, they consult the traditional healers. It is for this reason that where a patient consults two health care practitioners simultaneously, the process of getting traditional healers and biomedical personnel to work together becomes a reality. Table 4.2 reveals that three (13%) of the participants interviewed were faced with the dilemma of clients mixing traditional medicine and ART. Statements indicative of this dilemma were:

*“The challenges we are facing are those patients who combine this medication with other medication because when they do that they will not reach their required goal. They also end up defaulting as it's like they trust the traditional healers more than us”.*

*“The major challenge which we have is the use of traditional medicine. This should be seriously addressed, because even in our national and higher offices there's still that room for people to use the traditional medicine. As they are saying that one can-not just rely on ARVs, so people are given liberty to try them”.*

*“Most of them are telling each other in the community that there is no cure and this treatment will not cure us, so we need to use traditional herbs as well”.*

Dhalla *et al.* (2006) did a cross-sectional study of 682 participants in Canada that examined types and determinants of complementary and alternative medicine (CAM) as well as examining adverse effects associated with CAM use and ART. They found that CAM use was common and that both patients and health professionals should be aware of potential toxicities leading to urinary problems and peripheral neuropathy as well as drug interactions related to the use of CAM and HIV/AIDS treatment.

Consequently, the role of traditional healers in the context of HIV/AIDS is worth noting. Nzima *et al.* (1992:89) state that it remains necessary to draw attention to the role the traditional healer plays in the life of black people, because the traditional healer is accessible and sometimes the only available health care service provider nearer to the people in the event of illnesses. A statement supporting this is as follows:

*“Some of our clients are staying far away from the hospital”.*

In Sub-Saharan Africa, the ratio of traditional healers to the population is approximately 1:500, while that of medical doctors is 1:40 000 (Karim *et al.*, 1994). Participants' experience suggests that more research and inquiries are needed into traditional medicines and traditional healing, as the issue of ARVs and traditional medicine is

becoming a public health dilemma, not only to the nurses, but to every stakeholder involved in the field of HIV/AIDS. Based on the statements recorded, if patients are living closer to a traditional healer than to a hospital and do not have a stable source of income, they are bound to meet their medical needs through traditional healers living in their community.

*e) Access to social grants*

The majority of the world's HIV infections occur in communities ravished by poverty (Fenton, 2004; Kalichman *et al.*, 2006). Social grants are meant to ease the suffering of those infected and affected by HIV/AIDS, however all these good efforts are undermined if there is no follow-up or long term plan. During the research, two (9%) of the participants cited accessing social grants that can be linked to poverty among PLWHA as a challenge to them as indicated by the following statements:

*"Another challenge is that of the grants. Our patients comply up to a certain period as soon as they feel that their CD4 count is increasing, they stop taking medicine because they are afraid that the grant will be stopped. Some don't even come to the clinic for their treatment until they are worse off".*

*"Some don't even wait for their CD4 count to go up, they just fall pregnant as they will get grants for being HIV positive, on treatment and also the grant for their unborn child".*

As shown earlier (Table 4.2) most of the participants cited that PLWHA have a low socioeconomic status, hence the need for social grants. However, the participants cited a need for consultations regarding social grants before they were introduced so as to ensure strict measures and to aid PLWHA in buying food and also adhering to treatment by going to the clinics as per appointment. On the other hand, the prospect of social grants being stopped also increases a person's chance of engaging in risky behavior such as not adhering to ART or deliberately falling pregnant.

*f) Treatment defaulters and patients unwilling to adopt healthy lifestyles*

Previous research has revealed that if therapies are not adhered to, they become less successful and may lead to the development of resistant strains of HIV which are problematic not only to the patient affected but also to public health, as these strains can be transmitted to others, limiting treatment alternatives (Chesney *et al.*, 2000; Spire *et al.*, 2002; Tucker *et al.*, 2003; Holstad *et al.*, 2006). Substance use problems are common among patients infected with human immunodeficiency virus (HIV) and may impede adherence to antiretroviral regimens (Cohen *et al.*, 2002; Tucker *et al.*, 2003). Smoking is the key risk factor for lung cancer, and HIV positive patients, who tend to smoke more than the general population, must be informed of the risks and encouraged to stop especially if smoking is going to compromise on ART adherence (Lavoľe *et al.*, 2005). Miguez-Burbano (2005) found that tobacco use, which is widespread among HIV-infected subjects, increases the risk of pulmonary infections, particularly *Pneumocystis carinii* pneumonia (PCP) and community-acquired pneumonia (CAP), two respiratory infections with high prevalence and morbidity risks even in the era of HAART.

Statements indicative of this cited as challenges by two (9%) participants in this study are as follows:

*“Some of them are staying far away from the clinic to come and collect the treatment hence they end up defaulting treatment, some are still not accepting that they are HIV positive, some continue drinking alcohol”.*

*“Patients not willing and totally complying to take treatment, some of them not willing to change their lifestyle like smoking or drinking although we give them health education before treatment for them to stop drinking alcohol or smoking. Some of them are actually saying instead of quitting smoking, they would rather stop treatment.*

A study by Holstad *et al.* (2006) involving 120 HIV positive adults on HAART in the United States of America found that adherence to HAART was correlated with perceived support, absence of barriers as well as strong intentions to adhere to treatment and

perceived effectiveness of the medications. These findings were supported by results from a study by Veinot *et al.* (2006) who found that themes related to HIV treatment among young people infected with HIV included 1) *Treatment knowledge*, 2) *Treatment decision making*, 3) *Difficulties taking medicine* and 4) *Inconsistent treatment adherence and treatment interruptions*. For the first theme, it was revealed that the participants did not understand, or believe in antiretroviral treatment. The second theme stated that the participants did not feel they had choices about treatment, and others did not feel ready to make treatment decisions. In the third theme, participants portrayed problems with social routine disruption and side effects contributing to treatment interruptions. In the last theme, the participants viewed costs of medications as a barrier to treatment. However, the latter is not the case for South Africa, as ART is free of charge and applicants who are eligible and qualify for treatment are accessing it. Statements indicative of this are as follows:

*“Our treatment is for free, and we make sure that all qualified patients are receiving treatments and others grants”.*

*“They are crying to get treatment and when they become stable they stop the treatment”.*

This study and statements from participants supported findings from previous investigators who identified adherence to be a challenge not only for those who are HIV positive but also for health workers (Garcia & Cote, 2003; Savini *et al.*, 2003; Holstad *et al.*, 2006; Zachariah *et al.*, 2006). Furthermore, such statements expressed as challenges by participants have important implications for practice. Health care providers should therefore assess and support patient adherence through routine counselling (Thrasher *et al.*, 2006).

*g) Increase in the number of HIV positive pregnant women*

Almost half of the 37.8 million people living with HIV globally are women and more than two million pregnancies occur in HIV-positive women each year (UNAIDS, 2004). Women living with HIV/AIDS may be more susceptible to direct or obstetric causes of

maternal mortality, such as post-partum haemorrhage, puerperal sepsis and complications of caesarean section, in part due to concurrent AIDS-related anaemia or immune deficiency (McIntyre, 2005). In South Africa, the National Committee on Confidential Enquiries into Maternal Deaths (2000:368) found that AIDS was the second most common cause of maternal deaths in 1998, accounting for 13% of all deaths in women.

Although children are sometimes infected through blood transfusions and infected tools, 40 to 90% of them acquire HIV from their mothers around the time of birth (Giaquinto *et al.*, 1998; Wilfert 1998). From this study one (4%) participant cited the challenge of the number of HIV positive pregnant women increasing and a statement indicative of this is as follows:

*“Another challenge is that, those on treatment when their CD4 count improves especially women they then fall pregnant. Every month we have new patients who are falling pregnant”.*

As prevalence rates of HIV increase in pregnant women, pediatric HIV/AIDS will become a major public health problem (Kumar *et al.*, 2006). In sub-Saharan Africa, more than 11 million children under the age of 15 have lost at least one parent to AIDS, representing one-third of the total number of children who have been orphaned worldwide (Atwine *et al.*, 2005). These children whose mothers have died of AIDS related illnesses experience adverse outcomes such as dropping out of school and not enrolling for school, this ultimately means that orphans will worsen their own life chances, as well as the long term economic prospects of the countries they live in (Van Rensburg & Human, 2005; Ainsworth & Filmer, 2006). In conclusion, it remains a challenge to motivate and enable HIV positive women of child bearing age to practice safer sex as they are predisposing their health as well as their unborn baby's to further complications (Kumar *et al.*, 2006).

***Impact of nurses' daily challenges on their perception to be able to render effective nutritional care to PLWHA***

In accordance with other research about general challenges faced by nurses (South African Department of Health, 2002:97-98), poverty was closely linked with PLWHA (Fenton, 2004; Kalichman *et al.*, 2006) and their inability to access good nutrition that would improve their quality of life. The challenge to participants was the issue of talking about healthy diets to patients without a stable source of income hence influencing the need to know more about proper nutrition and their ability to render effective nutritional care to their patients. Furthermore, shortage of staff leads to increased patient load per nurse (Department of Health, 2002:98) to such an extent that time becomes a critical and limiting factor for the participants to educate or inform themselves with current nutrition information in the context of HIV/AIDS. In addition, the challenge of being faced with treatment defaulters and PLWHA adhering to unhealthy lifestyles such as drinking alcohol and smoking had a negative impact on participants' perception as health care service providers especially on their ability to effectively communicate and advocate for health lifestyles and good nutrition to PLWHA. In conclusion these daily challenges negatively influences nurses' perception regarding their ability to deliver nutritional care to PLWHA as they are become obstacles to adequate health care service provision.

***4.3.2 Concerns of PLWHA relating to HIV disease progression, access to treatment, side effects, disclosure and eligibility to social grants***

To assess the participants' perception regarding their ability to render effective nutritional care to PLWHA, concerns of PLWHA emerged as another theme which subsequently had five sub-themes (Table 4.4) which are discussed thereafter. Issues such as accessing social grants were strongly linked to the poor socioeconomic status of PLWHA making it a priority for participants to address the social needs of PLWHA rather than increasing participants' awareness on their ability to offer nutritional care to PLWHA. The participants felt that although they need to be fully equipped in the area of nutrition and HIV/AIDS all their efforts would be undermined if PLWHA who are on treatment are food insecure. Furthermore, the other concerns of PLWHA such as the fear of dying, disclosure, side effects and accessing ART influenced participants to spend more time addressing these, ultimately impacting on their ability and time to fully render nutritional care to PLWHA.

**Table 4.4:** PLWHA' concerns in relation to HIV/AIDS

Major theme	Sub-themes	Number of participants
Concerns of PLWHA	Access to social grants	13 (57%)
	Fear of dying	4 (17%)
	Disclosure	3 (13%)
	Side effects from ART	2 (9%)
	Eligibility for accessing treatment	1 (4%)

*a) Accessing social grants*

In this study, 13 (57%) participants cited accessing social grants as a concern PLWHA. This is a recurring sub-theme and in line with the initial deliberations that were also brought about by participants as challenges they face on a daily basis earlier on. However, statements indicative of this are as follows:

*"They are usually asking for grants, and that's the first thing they ask because of their socio-economic status".*

*"Will I get the grant to be able to buy food because people on ART eat a lot?"*

*"Most of them have social problems and are asking for the grants saying do I qualify, what happens when it's taken away from them?"*

As previously alluded to, most of the patients that are seen by the participants on a daily basis come from poverty-stricken families, hence it makes sense for them to ask for social grants.

*b) Fear of dying*

According to Thomason *et al.* (1996) the combination of multiple stressors, limited social support, potential loss of family members, and psychiatric manifestations of HIV infection places patients at significant risk for depression and suicide. Furthermore,

Balbin *et al.* (1999) states that psychosocial influences relating to faster disease progression include life-event stress, sustained depression, denial/avoidance coping, concealment of gay identity (unless one is rejection-sensitive), and negative expectancies. In this study, four (17%) participants stated that PLWHA were concerned about dying; statements indicative of include:

*“Is it true there is HIV/AIDS, and again is it true that it’s not curable, and if I’m young will I die and if I want to have a baby, what do I do?”*

*“When I’m having this disease, and the infections, and rash, when I’m HIV positive, will it be cured?”*

Holden (2002:56) states that if PLWHA can substantially reduce their feelings of stress, and fear of dying, they may help their immune system to function better and cope more effectively with HIV and secondary infections. Furthermore, it is a well-known fact that AIDS has no cure; however PLWHA need to be counselled thoroughly so as to adopt a positive lifestyle attitude as well as having a good support system at home and within the community (Jackson, 2002:203).

*c) Disclosure*

From Table 4.4, three (13%) participants cited disclosure as a concern to their clients, statements indicative of this are as follows:

*“We have one entrance to the hospital and somebody is scared to be seen coming to the Wellness clinic, hence they want to know when the clinic would move from the hospital. They are embarrassed to be seen coming to this side for treatment, scared to be seen by their sister in law, or brother or neighbors”.*

*“They say they are not accepted at home and others are not accepting their status, hence they end up not disclosing”.*

*"They usually say; will I be OK? What will I do? Will you help me? Do I have to tell the people at home about my status?"*

In conclusion, disclosure within households and in communities in practice can be quite complex as some PLWHA are concerned about how other people will view them, judging by the participants' statements above. However according to Jackson (2002:215) openness may be the start of both giving and receiving support.

*d) Side effects*

Antiretroviral therapy for HIV has become increasingly complex to manage on a day-to-day basis as the new standard of care is to treat with potent combination regimens (Chesney *et al.*, 2000; Roca *et al.*, 2000; Johnson *et al.*, 2005). These regimens, with numerous pills and sometimes conflicting dosage schedules (e.g., two or three times daily, with and without food), are frequently associated with mild to moderate, although sometimes severe, adverse effects and can have a long list of contraindicated medications (Lyons, 1997). Two (9%) of the participants cited side effects as a concern to PLWHA and statements indicative of this are as follows:

*"They are having treatment problems that need to be addressed such as the side effects they are experiencing".*

*'They have medication problems which are confusing them"*

These statements are supported by a study done in the United Kingdom by Erwin and Peters (1999) using six focus groups with a group of 44 black Africans. Erwin and Peters (1999) found that apart from the fact that the drugs call for strict adherence to the prescribed regimen if they are to remain effective, side-effects ranging from nausea and diarrhoea to neuropathy and lipodystrophy were of particular concern to the participants. Furthermore, a cohort prospective study by Roca *et al.* (2000) in Spain with 65 previously treated patients found that refusal to take medications and side effects were the main reasons for patients to stop therapy.

*e) Eligibility for treatment*

ARVs slow down HIV replication to such an extent that the viral load in the blood is reduced to very low and even undetectable levels, allowing CD4 counts to recover (Holden, 2002:56). For this reason, ARVs can be a window of hope to PLWHA. Of particular concern is patient monitoring, including for side effects, benefits of the drugs, and for patient compliance. One participant cited eligibility for treatment as a concern to some PLWHA. Statement indicative of this is as follows:

*“They want to know when they can be put into the ARV programme as well”.*

However, there is need for a treatment supporter for an eligible patient about to start ART so as to ensure that the patient maintains adherence always.

***Impact of the concerns of PLWHA on nurses' perception regarding their ability to render nutritional care to PLWHA***

This study showed that concerns of PLWHA such as accessing social grants, fear of dying, disclosure, accessing ART and side effects tended to overshadow the need for participants to improve their own ability in the nutritional care of PLWHA. Furthermore, participants felt that it takes more time to care for PLWHA including addressing their concerns to the extent that this influences participants' perception regarding their ability to render effective nutritional care as they do not have enough time to continuously inform and educate themselves regarding current nutritional information for HIV/AIDS.

***4.3.3 Importance of nutrition care in HIV/AIDS: nurses' own perception***

HIV infection has been widely shown to be linked with lower blood serum levels of at least the following nutrients: folate, vitamin A, vitamin B complex, vitamin C, vitamin E, and the minerals: selenium, zinc and magnesium (Allard *et al.*, 1998; Butensky, 2001; Gasparis & Tassiopoulos, 2001; Gil *et al.*, 2005; Piwoz & Preble, 2000). Furthermore, malnutrition has also been linked to increased HIV progression to AIDS (Evans & Halliwell, 2001; Fawzi *et al.*, 2004 & 2003; Jackson, 2002:60; Jiamton *et al.*, 2003; Lettow *et al.*, 2003). All participants in this study agreed that nutrition was very

important in the management of HIV/AIDS (Table 4.5). Some of the statements indicative of this are as follows:

*“It’s not only treatment that works as it has to be reinforced with good nutrition. There’s one thing we always asked our patients to do, which was to memorise their last weights and everytime we weighed them it became easier for them to monitor what was going on. The patient is becoming more involved in taking care of their own health and understanding her progress”.*

*“Actually what is needed is they should include nutrition, as some say we can’t take the drugs on an empty stomach and they don’t take the medicine”.*

**Table 4.5:** Nutrition, training and guidelines in the context of HIV/AIDS

	Percentage distribution	Number of participants
<b>Nutrition important in HIV/AIDS</b>		
Yes	100	23
<b>HIV/AIDS and nutrition training</b>		
Yes	61	14
No	39	9
<b>Training course duration</b>		
<1 week	26	6
1 week	9	2
2 weeks	17	4
6 months	4	1
1 year	4	1
Not applicable	39	9
<b>Refresher courses</b>		
No	65	15
Not applicable	35	8
<b>Knowledge/Awareness of South African HIV/AIDS and nutrition guidelines</b>		
Yes	9	2
No	91	21

Although all participants stated that nutrition was an important part of care for PLWHA, Table 4.5 shows that 14 (61%) of the participants received HIV/AIDS training that had a component of nutrition for a period ranging from less than a week to a year. However nine (39%) of the participants have not yet received any training. It should be noted that of those participants that attended training, none have had a refresher course in that area. This lack of follow-up training implies that participants may be unaware of current scientific nutrition and HIV/AIDS information which may further enhance their understanding and improving their ability to provide effective nutritional care to PLWHA. In this study, participants were asked to recall what they had learnt at the workshops. Statements indicative of this from participants that attended the training are as follows (*it should be noted that the participants had been asked to name topics they recalled from their training*):

*“(PAUSE) I don’t remember but it included diet and other basic things”.*

*“Babies born to HIV positive mothers and how they can be taken care of. Someone talked of camel milk, and also supplements”.*

*“They talked about balanced diets, including spinach, beans and how to grow vegetables in a plastic bag especially for those who do not have enough space at home so they taught us how to make small gardens in a plastic until the time they are ready to be eaten”.*

*“Uhm (long pause), there were a lot of things we discussed (pause), like (uhm, laughs) advising patients on garlic, it’s sort of a herb, the importance of having diets with herbs like garlic and GARLIC stood out in my head, vitamin foods like vegetables especially. Uhm, it’s just that I’ve forgotten but they talked about a lot of things with regard to nutrition”.*

In addition follow up or refresher training reviews previously imparted information or updates service providers in new information about a previously covered topic (Regional

Centre for Quality of Health Care, 2003:51). For example, to ensure retention and application of nutritional care information, refresher training can be given to nurses periodically following initial training. This can also include new recommendations based on recent findings and experience.

The importance of nutrition in the context of HIV/AIDS emerged as a major theme from the interview questions and had five sub-themes (Table 4.6) discussed thereafter.

**Table 4.6:** Nurses’ perception regarding Nutritional care and HIV/AIDS: obstacles and recommendations

Major theme	Sub-themes	Number of participants
Nutritional care and HIV/AIDS (nurses’ perception)	Nutrition part of HIV/AIDS treatment and care	23 (100%)
	Lack of policy implementation	21 (91%)
	Collaboration	1 (4%)
	Counselling and education	1 (4%)
	Household nutrition gardens	1 (4%)

*a) Nutrition as part of HIV/AIDS treatment and care*

Achieving optimal nutritional status is a challenge for anyone living with HIV. Nutrition and HIV are strongly related to each other as any nutrition impairment because of HIV/AIDS leads to malnutrition, and malnutrition leads to immune impairment which worsens the effect of HIV and contributes to the rapid progression to AIDS (FANTA, 2001:12). All participants cited nutrition as an important component of care and treatment for PLWHA as evidenced by statements such as:

*“Yes, we talk about healthy eating, especially encouraging them to have gardens at home”.*

*“We talk about balanced diets, to avoid alcohol, and not to take traditional herbs as it interferes with ARVs”.*

*“Yes (Uhm), mostly we’ll be speaking about spinach, carrots, cabbage and those who can do beans like green beans, and though there’s this concept of beetroot we actually encourage them to eat it as well as they can eat the bulb and the leaves like vegetables”.*

*“Yes nutrition affects HIV, they’re taking ARVs, and this treatment can’t work on an empty stomach so they need to have food in order to boost their immune system”.*

*“Very much, in our programme we run it comprehensively, and we have dieticians. So we usually refer our patients to them and they are weighed. We provide them with supplements”.*

The South African Guidelines on the Nutritional Care for People Living with TB, HIV/AIDS and other Chronic Debilitating Conditions advocate for among other things consumption of healthy balanced diets, plenty of fresh fruits and vegetables, and the above statements also conform to the guidelines. Possible interventions to improve on this is development of user-friendly information, education and communication materials for health institutions as these may serve as constant reminders to health care service providers.

*b) Lack of policy implementation*

According to the South African Nutritional Guidelines for People Living with TB, HIV/AIDS and other Chronic Debilitating Conditions produced in 2001, PLWHA need a well balanced diet because it slows down the progression of HIV to AIDS and improves the patient's quality of life. However only two (9%) of the participants agreed to having seen and read the guidelines while the remaining participants (Table 4.6) had either seen or heard about them but were not aware of the contents thereof. Statements from those that were unaware of the contents of the guidelines were as follows:

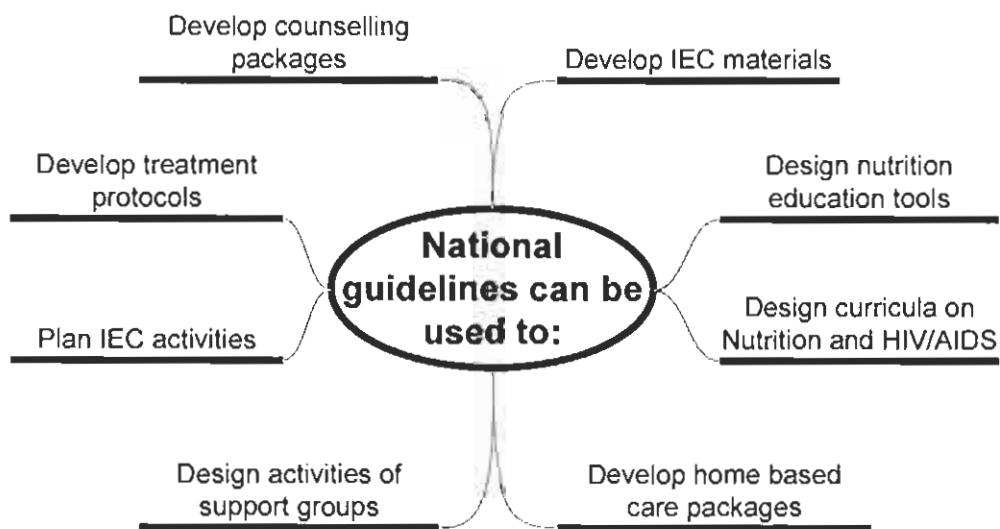
*“I have also seen the guidelines, but I don’t know what’s in them (laughs) because there’s no one who has reinforced them. What I know is that we are providing people with mealie meal and milk”.*

*“I’ve seen the guidelines but I didn’t get deeper into reading them as we don’t have the time to read”.*

*“Yes I have seen the guidelines in 2003, but did not read them”.*

*“No I haven’t seen the guidelines, not even in this clinic”.*

National guidelines enable programs and services to provide consistent and sound recommendations and they can contribute to greater awareness of the importance of nutritional responses to HIV/AIDS (Regional Centre for Quality of Health Care, 2003:45). National guidelines on nutrition and HIV/AIDS can be applied in a wide variety of ways (Figure 4.1).



**Figure 4.1:** Uses of national guidelines on Nutrition and HIV/AIDS (Regional Centre for Quality of Health Care, 2003:45); (IEC = information, education and communication)

Implications of having nurses who are unaware of these guidelines especially when they deal with PLWHA on a daily basis may be a key limitation to the development and implementation of effective nutrition and HIV/AIDS interventions and strategies at all levels.

The summary in Table 4.7 also indicates that only South Africa in the Southern Africa Development Committee (SADC) region has all the protocols and guiding documents in relation to HIV/AIDS (Zungu-Dirwai *et al.*, 2004:39). It should be noted that South Africa has shown some level of commitment in the management of the HIV/AIDS epidemic. However the challenge is to turn these guiding statements/principles into practical operations so as to impact positively on the people at grassroots level. The aim of the guidelines is to prevent and treat opportunistic infections and associated malignancies as well as to improve the quality of life of PLWHA and those affected by HIV/AIDS.

**Table 4.7: Summary of findings on the existence of HIV/AIDS guiding documents**  
(Zungu-Dirwai *et al.*, 2004:39)

Document/Country	Bots	Les	Mal	SA	Swa	Zim
National VCT protocol	✓			✓	✓	✓
National HIV/AIDS Testing manual	✓		✓	✓	✓	
National guidelines on PMTCT	✓		✓	✓		✓
National guidelines on infant feeding of HIV positive mothers	✓			✓	draft	✓
Guidelines on nutrition for PLWHA	✓		✓	✓	draft	
Home-based care	✓		✓	✓	draft	✓
Orphan care	✓			✓		
HIV/AIDS and prisons	✓			✓	draft	
Condoms	✓		✓	✓	draft	
Youth manuals on HIV/AIDS	✓			✓	draft	
Dual manual on TB and HIV	✓		✓	✓	✓	
Clinical management of HIV in children	✓			✓		

Bots=Botswana; Les = Lesotho; Mal = Malawi; SA = South Africa; Swa = Swaziland; Zim = Zimbabwe; VCT = Voluntary Counselling and Testing; PMTCT = Prevention of Mother to Child Transmission; TB = tuberculosis; PLWHA = People Living With HIV/AIDS

*c) Collaboration with other professionals in the nutrition field*

The HIV/AIDS epidemic has posed a challenge not only to the nursing profession but to all health care disciplines to work collaboratively with each other, as the complex needs of society exceed the capability of any single discipline (Regional Centre for Quality of

Health Care, 2003:23). Nutrition is viewed as an essential part of nursing knowledge and practice and is taught as part of the student nurse curricula in South Africa (North West University, 2006). However, the current South African educational curricula in nursing schools contain limited integration of nutritional care for PLWHA (North West University, 2006). Student nurses are taught about clinical nutrition in the context of overall health, public health nutrition issues such as obesity and diabetes and their prevention as well as health promotion. Collaboration of nurses with other professionals in the nutrition field as well as among stakeholders should be promoted as this has been shown to strengthen the control of the AIDS epidemic (Paquin & Lambert, 2000; Kaboru *et al.*, 2006). Statements indicative from participants indicating a need to collaborate with nutrition professionals included:

*"Maybe what we can do is to have regular in-service with the dieticians and nutritionists".*

*"We hear of the nutritionists at the district but we haven't seen or met them, it's important that the nutritionists visit our clinics as well. Preferably we need to meet nutritionists as well".*

Gardner *et al.* (2002) conducted a study in the United States of America with 25 dietitians to describe methods of collaboration used by dietitians to conduct outcomes research and to identify perceived barriers to participation in outcomes research and had the following six emerging themes:

- collaboration helps diminish common barriers,
- collaborators can benefit from each others' experience and abilities,
- collaboration provides mutual support throughout the entire research process,
- collaboration enhances interdepartmental relationships,
- collaboration with other health care providers expands the influence of the dietetics/nutrition profession and,

- collaboration within and between health care professions can assist the incorporation of outcomes research into more facets of the dietetics/nutrition profession.

In conclusion they found interview data suggesting that collaboration, especially between disciplines enhances the entire research process and generates benefit beyond the specific project.

#### *d) Counselling and education on nutrition*

Nutrition education is an essential component of the total health care available to people with HIV infection throughout the continuum of care (Department of Health, 2001:1). Nutrition counseling as an integral part of HIV care can improve health outcomes at any stage of the disease, from helping newly infected people to stay healthy, assisting people taking ARV drugs to manage their therapy and to allow people with end-stage AIDS to die with dignity (Rabeneck *et al.*, 1998). Malnutrition at the time that antiretroviral therapy is initiated is associated with significantly poorer survival (Paton *et al.*, 2006). However, there are many potential barriers to the effectiveness of nutrition education and counseling interventions such as people's perceptions regarding their role in the context of HIV/AIDS. Statement from a participant indicative of this is as follows:

*"There are dieticians there so why should I worry about nutrition, but at the same time we need training, although we are doing so much like helping the doctor, counseling the client to sweeping the floors".*

In this study one (4%) participant firmly regarded counselling and education on nutrition as of paramount importance, the following statement is indicative of this:

*"On nutrition, there is a need for training because we always get stuck when the dietician is not around".*

These verbatim quotations are supported by the randomised controlled trial (RCT) conducted by Rabeneck and colleagues (1998) which evaluated the effects of nutrition

counseling with or without oral supplementation in malnourished patients infected with HIV in the United States of America. They found that the treatment group when compared with the control group had larger increases in fat-free mass and grip strength, although the differences were not statistically significant. However, these findings suggest some evidence regarding nutrition counseling and its possible role in the management of malnourished HIV positive patients. It should also be noted that evidence with such nutrition approaches are still scarce.

*e) Household food gardens*

Many people with AIDS face hunger and multiple barriers to food and nutrition security. Coupled with their HIV status and the disease's complications, some people are facing economic insecurity, social isolation and stigmatisation, inadequate cooking skills and facilities, limited food availability and dietary diversity. Furthermore, achieving optimal nutritional status for anyone living with HIV in a poverty-stricken environment can become quite a challenge. However, safe access to appropriate food in an acceptable environment is an important part of improving and maintaining physical and emotional health such as starting household nutrition gardens with locally available, affordable and nutritious foods. This is supported by statements such as:

*“One can plant a garden in their home for vegetables, and then also eat beans, as beans and vegetables are not that expensive. One can grow the vegetables like beetroot and garlic which are very vital”.*

Consumption of fruits and vegetables for 3 months improved the CD4+ count and total antioxidant status of PLWHA thus demonstrating a positive effect on health (Gil *et al.*, 2005). In conclusion, the role of food and nutrition security in maintaining the family unit, preserving livelihood strategies, and prolonging life is an important component in developing countries, where the survival of family members and community infrastructure is dependent on passing of indigenous survival-related strategies to future generations (Sharpstone *et al.*, 1999).

***Implications of participants' perception concerning the importance of nutritional care in HIV/AIDS and its' influence on perception regarding their ability to render effective nutritional care to PLWHA.***

The results indicate that participants perceive nutrition as important in the context of HIV/AIDS care. However, they have shown a need for collaboration with other stakeholders so as to increase their knowledge which ultimately affects their ability to deal effectively with the nutritional care of PLWHA. Nutrition professionals should facilitate the understanding of the importance of nutritional care to PLWHA through regular in-service and follow-up training as perceived to be important by participants as it positively influences their ability to deal with the nutritional care of PLWHA. Furthermore, a basic knowledge of nutrition in the area of HIV/AIDS may ensure that nurses are able to reinforce long-term maintenance of dietary change to PLWHA on ART. Access to national guidelines by potential users is critical, but access alone does not ensure that the guidelines will be effectively used to improve nutritional care and support. There is need for identification of channels and developing mechanisms and materials to communicate nutritional care and support messages to PLWHA, health care service providers and caregivers (Regional Centre for Quality Health Care, 2003:40). The lack of policy implementation from this study may have influenced participants' perception regarding their ability as well as confidence to render nutritional care to PLWHA as they were unaware of the contents of the guidelines.

***4.3.4 Perceived ability with regard to giving nutritional advice to PLWHA***

According to Schaller and James (2005), nurses are ideally placed to act as nutrition educators and they therefore need a sound knowledge of general nutrition relevant to their area of practice. Table 4.8 gives an illustration of participants' perception regarding their level of ability when asked to rate themselves on a Likert-type 5-point scale ranging from "very bad" to "very good" (1 = very bad; 2 = bad; 3 = average; 4 = good; 5 = very good) and skills they think they needed to have to render effective nutritional care to PLWHA. Participants brought about the following skills they perceived to be important in the area of nutrition and HIV/AIDS: *communication, listening and knowledge*. Although knowledge could be debated as it is not a skill per se, the participants believed that one needs to acquire nutrition knowledge first and then improve on the communication and listening skills with more exposure and training. Ten (44%) of the

participants interviewed rated themselves as average, eleven (48%) participants as good whilst only 4% representing one participant felt they were very good. The reason cited was that this participant had been a nutrition educator for a period of 10 years; hence had been exposed to that particular field and felt confident to say so. The remaining participant rated herself as poor and the reason being lack of training with regard to nutrition and HIV/AIDS.

**Table 4.8:** Participants’ perception regarding their ability, skills required and confidence to deal with nutrition in the context of HIV/AIDS

	Percentage distribution	Number of participants
<b>Do you (participant) feel confident to talk about nutrition to PLWHA?</b>		
Yes	39	9
No	61	14
<b>Do you (participant) give out nutrition education to PLWHA?</b>		
Yes	57	13
No	43	10
<b>Where would you rate yourself in terms of the skills you (participant) perceive to have in nutrition and HIV/AIDS?</b>		
Very bad	4	1
Bad	0	0
Average	44	10
Good	48	11
Very good	4	1
<b>What skills do you (participant) require to render effective nutritional care to PLWHA?</b>		
Knowledge	61	14
Communication and listening	39	9

Fourteen (61 %) of the participants felt they were not confident to talk about nutrition education and this may be linked to the need to acquire more knowledge in the field of nutrition and HIV/AIDS. This is supported by few studies that have been done in Australia, England, Turkey and the United States of America to assess and document the nutritional knowledge of nurses. A descriptive cross-sectional study was done by Schaller and James (2005) to determine the nutritional knowledge of 103 nurses in regional Victoria, Australia. They found that the nutritional knowledge score reported ranged from low to moderate and recommended a nutrition knowledge standard as well as nutrition

knowledge needs of nurses working in particular areas of practice. However, the results on perceived ability had the greatest number of participants falling between the average to good score, although further statistical analysis would be needed to verify these findings. Furthermore, Warber and colleagues (2000) did a descriptive study to obtain a preliminary understanding of nutrition from a sample of 200 New England nurse practitioners in the United States of America. They found that nurse practitioner knowledge of nutrition principles may be suboptimal as a result of low priority given to nutrition education in undergraduate and graduate school in the nursing profession. They concluded by stating a need to encourage nurse practitioners to acquire a ready reservoir of up-to-date, scientifically based nutrition knowledge to effectively impart to their patients in clinic visits. Schaller and James (2005) further state that nurses may be unwittingly providing inaccurate information to clients or patients given the large number of patient contacts and emphasis on health promotion. Another descriptive, cross-sectional study was done by Karaçam and Kiti

## CHAPTER 5

CONCLUSION AND OUTLOOK FOR FUTURE RESEARCH

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**5.1 Introduction**

This study employed the qualitative research paradigm so as to understand and gain in-depth information about nurses' perception regarding their ability to render effective nutritional care to PLWHA. Eight hospitals participated in the study with a maximum of 23 nurses being interviewed. Structured interviews with open-ended and closed questions were used during one-to-one interviews as well as in focus group discussions. The previous chapter dealt with the presentation and discussion of results, this chapter concludes the study with possible recommendations as well as outlook for future research.

**5.2 Critical success factors from themes and recommendations**

It was found that nurses' perceptions regarding their ability to render effective nutritional care to PLWHA was affected by a complex number of factors which emerged as themes outlined as follows:

**Theme 1: Nurses' daily challenges in the context of HIV/AIDS**

Poverty has an effect not only on the patient's well being but on the nurses' ability to give effective care. Poverty reduction strategies aimed at PLWHA will therefore empower PLWHA to be self-reliant in terms of ensuring own food security. Furthermore caring for PLWHA involves physical risk (e.g. possibility of infection) and emotional challenges (e.g. stressful working conditions), thus health care givers should be supported (referring to the filling up of vacant posts within the health sector from the cleaner to the nurses) and motivated (by means of better incentives as well recognition of nurses' role in the AIDS epidemic) so as not to compromise on the quality of care to PLWHA.

**Theme 2: Concerns of PLWHA which affect nurses working with HIV/AIDS**

From the data, most of the participants cited that PLWHA have a need for accessing social grants and that providing these grants to PLWHA was therefore essential. However, a monitoring system to prevent the abuse of social grants is imperative. This monitoring system would ensure that mechanisms are put in place for the recipients to be self-reliant should the grants be stopped. Furthermore, raising awareness on grant usage is equally important so that recipients play their part in improving their quality of life. Other concerns of PLWHA which affect nurses in general also included the issue of disclosure and discrimination by members of society. The South African Department of Health supports the fact that it is not mandatory for one to disclose their status. However there is need for more awareness on HIV/AIDS such that there is acceptance of those infected and affected by HIV/AIDS within communities.

**Theme 3: Nurses' perception of the importance of nutrition in HIV/AIDS**

Nurses confirmed to be at the core of dealing with HIV/AIDS as well as facilitating the understanding of the importance of nutritional care to PLWHA. Despite the efforts done to create awareness on the South African guidelines on the nutritional care of people living with TB, HIV/AIDS and other chronic debilitating conditions, only a very small percentage of nurses in Wellness clinics are aware of the guidelines. This means that whatever efforts were made in the past communicating the contents of the guidelines by the Department of Health, there is still more work needed to be done in implementing them. Furthermore, this indicates a need for a communication strategy which ensures that nurses and other stakeholders in the area of HIV/AIDS are kept well informed about nutrition. It is worth noting that a sound nutritional programme for PLWHA based on the guidelines should be put in place prior to the commencement of ART as it is very necessary for the drugs to be augmented with nutritional foods. This programme should be effectively communicated to all health staff working in Wellness clinics.

**Theme 4:** Nurses' perception of their ability to render effective nutritional care to PLWHA

Nurses are most likely to make the largest impact in the health care system because of the fact that they are most often the first point of contact with patients. For that reason, every effort should be made to support them. Most of the participants rated themselves "average" in terms of their perception regarding their ability to render effective nutritional care to PLWHA. It was also evident that they experienced a need for better or more focused nutrition training. Cost-effective efforts such as in-service and regular training workshops to improve nutrition knowledge are likely to have a positive influence on nurses' perception and their ability to provide nutrition education which would influence dietary behaviors especially among PLWHA who are on ART. In this study, level of qualification and training was found to have a positive impact on nurses' confidence. Furthermore, information and education user-friendly materials should be developed by nutritionists, dieticians and nurses so as to encourage the spirit of collaboration among health care workers and ensure effective care. Overall, involving nutrition as a topic at undergraduate and postgraduate training can raise self-efficacy of nurses to deal better with the nutritional aspect of HIV/AIDS. It is important to the health of persons with HIV/AIDS to have access to the services of a registered dietician and/or nutritionist whose knowledge in the area of nutrition for HIV/AIDS is current. Therefore it is recommended that each Wellness clinic have a registered dietician and/or nutritionist so as to provide nutrition assessment, appropriate nutrition intervention counseling with appropriate educational materials to PLWHA and also health care workers.

**Theme 5:** Traditional healers and their role in the context of HIV/AIDS

Traditional healers and nurses must realise their role in terms of their limitations and impact in society. It would be unwise to ignore the role and impact of traditional healers as they are still regarded with high esteem in society. More research into the efficacy of traditional medicine as well as effective legislation is needed so as to maintain a consistent flow of information not only to PLWHA but everyone working in that particular area. Full recognition of traditional healers and traditional medicine in the context of HIV/AIDS will ensure that they are fully incorporated into the health system

such that all other health care providers respect their existence, as well as respect for each other's own methods of healing. Once the role of traditional healers is clearly defined, the traditional healers, biomedical personnel and other stakeholders working in the area of HIV/AIDS can operate efficiently through recognition of what is valuable from each side with mutual referral and an agreement of what illnesses should be treated or referred from one to the other (Oskowitz, 1991). This will entail concerted efforts to benefit the patient or PLWHA.

### **5.3 Conclusion**

Nurses view nutrition as important in the treatment and care of PLWHA. Nonetheless, there are factors in their working environment that hinder them in delivering effective nutritional care to PLWHA. Furthermore, there are a number of issues in the lives of their patients that make it difficult for them to do their jobs well. However, generally nurses view their ability to render effective nutritional care to PLWHA as average and that efforts could be made to change their perception. Traditional healers play an important role in the health care system and efforts should be made to establish an effective health care team which incorporates traditional healers. This work thus provides a foundation for further exploring ways to improve the ability of nurses in the nutritional care of PLWHA which will ultimately improve the quality of life of PLWHA.

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## EXAMPLE OF AN INTERVIEW WITH A NURSE

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### **What are the challenges you are facing as a nurse dealing with HIV/AIDS on a daily basis?**

The challenges I'm facing are that the patients that I deal with, when you look at their socio-economic background, it's very difficult for them to come for treatment, bearing in mind the issue of money for transport, money to buy food as they can't take the treatment on an empty stomach, and sometimes their families bring them to the clinic when they are very ill and their CD4+ counts are very low (lower than 50) and this time it will be late. So a patient can't access treatment earlier in time as a result of some of the reasons I've highlighted before. The major challenge which we have is the use of traditional medicine. This should be seriously addressed, because even in our national and higher offices there's still that room for people to use the traditional medicine. As they are saying that one can not just rely on ARVs, so people are given liberty to try them.

### **Are they mixing the two?**

Some do mix the two, although we emphasize a lot during the adherence counseling sessions that they shouldn't mix the two treatments.

### **Are they aware of the dangers of mixing the two?**

Uhm it's really difficult to say as they keep on having faith in the traditional medicine. Most of those that have used traditional medicines have slower progress and the common problem is that their liver enzymes will be high and they can't be put on ART until those liver enzymes go down and we have to constantly monitor that to ensure they are stable before being put on treatment.

**You mentioned socio-economic background as a challenge can you shed more light there?**

The challenge is that before a person can be put into a programme, there's a process which has to take place. To be in a programme it takes time. It may take 2 months for the forms to get to the right places. During that period the patient has to come to the hospital, to consult and they are struggling as they don't have money to come to the hospital. Hence they start using the traditional medicine until they qualify for the disability grant.

**So when they finally qualify for grants, how much do they get?**

R800/ month

**For how long?**

For now the social department has been providing them with grants until a time when their CD4+ counts are above 200 the grants are stopped. The social department wants reports after 6 months about the patient's progress. However we also encourage our patients to work as well and not rely entirely on the grants

**Any mechanisms put in place for people on grants to fall on after the grants have been stopped?**

It's very difficult to work on as we don't have specific programmes that we refer patients to after the grants have been cut. We don't have programmes in place as yet.

**How many patients are you seeing on a daily basis?**

In our hospital we have a session where we do VCT and for treatment, and per day we see 30-40 patients/day

**What questions are you mostly asked by PLWHA when they come for routine care?**

It depends on what problems they are having, when patients came to the hospital initially, they had to pay some money as per the existing policies in our hospital. That confused them

**You mean the consultation fees?**

Yes the consultation fees, then we had to agree with the hospital that all those patients on ART and they shouldn't pay. All the patients on disability or social grants, should bring their cards to the hospital and not pay. As it is a clear indication that they can not pay.

**Do you talk about healthy eating when PLWHA come for routine care?**

Very much, in our programme we run it comprehensively, and we have dieticians. So we usually refer our patients to them and they are weighed. We provide them with supplements.

**A dietician is around 24/7?**

Yes, we have a dietician for this ARV clinic

**Is there a relationship between HIV/AIDS and nutrition?**

A very strong relationship. It's not only treatment that works as it has to be reinforced with good nutrition. There's one thing we always asked our patients which was to memorise their last weights and everytime we weighed them it became easier for them to monitor what is going on. The patient is becoming more involved in taking care of their own health and understanding progress about herself.

**Do you feel confident to give out nutrition information or education?**

Yes, it also depends on what I would want to communicate to people

**What skills do you need to render effective nutritional care to PLWHA?**

I think firstly, a person should have passion to work with HIV/AIDS patients, knowledge and how to communicate as well as listen. A person should (uhm) have.....

**On a scale of 1-5 where would you place yourself in terms of the skills that you think you have in the area of HIV/AIDS and nutrition?**

I think I'm good

**What can be done to ensure that you improve?**

Maybe what we can do is to have regular in-service with the dieticians and nutritionists. We hear of the nutritionists at the district but we haven't seen or meet them, it's important that the nutritionists visit our clinics as well. Preferably we need to meet nutritionists as well.

**You mentioned training on HIV/AIDS and nutrition earlier, anything you remember from that training?**

Uhm (long pause), there were a lot of things we discussed (pause), like (uhm) advising patients on garlic, it's sort of a herb, the importance of having diets with herbs like garlic and GARLIC stood out in my head, vitamin foods like vegetables especially. Uhm, It's just that I've forgotten but they talked about a lot of things with regard to nutrition

**If you were to advise the people that trained you, what you tell them?**

What we need to iron out is the diets that involve herbs in relation to HIV like for example garlic. As I'm a bit concerned about garlic and how it really interacts with ARVs. Really we need to clarify on which is which.

**Have you seen the South African nutritional guidelines on the nutritional care of people living with TB, HIV/AIDS and other chronic conditions?**

For now we don't have them and I haven't seen them

**Suppose I'm HIV+ and I ask you for advice regarding the food basket I should have in my home per month, what would you advise me?**

Uhm, I think what I can say is that a person should have vegetables as they are not expensive like meat, sorghum, and sorghum can also help those with low haemoglobin.

**What are the things you would like to do better in the context of HIV/AIDS and nutrition?**

Uhm, I think we have to look at the criteria we use to distribute nutritional supplements. For now we haven't been receiving quite a lot of them. So we've been prioritising those

who are underweight and not on social grants. However we need to be giving everybody who's underweight whether or not they are on grants. We would also want to have regular contacts with the nutritionists in the district as we are mostly dealing with treatment, counseling and nutrition is always sidelined, however there should be teamwork from everybody.

**Anything else you may want to add?**

I want to know more about traditional medicine, as I'm worried about that and traditional treatments. Last time I attended a meeting in Mafikeng and they were talking about ARVs and the challenges. I hinted out the issue about traditional medicine but the response I got was that even at the national level there's still controversy on the use of traditional medicine. The concern was that the media now is advertising traditional medicines that interfere with ARVs. So I was asking what the government can do, if you look at cigarette smoking, the Minister criticised smoking so why can't that be done on traditional medicines and it's effect on ARVs publicly? I don't know there really is a cultural dilemma.



NORTH-WEST UNIVERSITY  
YUNIBESITHI YA BOKONE-BOPHIRIMA  
NOORDWES-UNIVERSITEIT

Knowledge Management Directorate  
Department of Health  
P. Bag X2068  
Mmabatho  
2735

**Nutrition**  
Tel (018) 299 2466  
Fax (018) 299 2464  
EMail vgedc@puk.ac.za

31<sup>st</sup> March, 2006

**Dear Ms. S. Malakane**

**RE: REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

I am currently studying for the MSc. Nutrition degree at North West University (NWU-Potchefstroom Campus).

I hereby request permission to conduct the research entitled: **Professional nurses' perception of their ability to render effective nutritional care to People Living With HIV/AIDS (PLWHA) in North West Province**. The specific districts in North West Province we have targeted for this study are: Mafikeng, Rustenburg, Taung, Klerksdorp, Odi, Zeerust, Ganyesa, Brits and Potchefstroom. The targeted hospitals are Bophilong-Mafikeng, Taung, Thusong, Ganyesa, Potchefstroom, Rustenburg, Klerksdorp, Witrand, Zeerust, Lehurutshe and Jubilee. We intend interviewing 3 professional nurses at each hospital and especially those who are dealing with PLWHA.

The main aim of the research is:

- to understand and describe the perception of registered nurses regarding their ability to render effective nutritional care for PLWHA

The outcome will be:

- better understanding of nurses' insight on nutrition and HIV/AIDS.

The results will be used to:

- recommend continued professional development of nurses on nutrition and HIV/AIDS (e.g. further training of nurses has a ripple effect on the society as a whole),
- inform policymakers about the situation on the ground e.g. South African Department of Health and,



- o advocate for consistent and coordinated dissemination of nutrition education messages to professional nurses.

The study has already been **approved** by the **Ethics Committee of North West University** and **Knowledge Management of the North West Department of Health**. I have included the approval letters for your perusal. The period during which I plan to begin data collection is 1<sup>st</sup> May, 2006.

The research will be conducted under the supervision of experts in Nutrition, HIV/AIDS, Community Nursing and Nursing Research at the School of Physiology, Nutrition and Consumer Sciences and the School of Nursing Science, NWU (Potchefstroom Campus).The entire respondent's information will be treated as highly confidential and code names will be used during data collection.

Your favourable consideration of the matter and a response at your earliest convenience will be appreciated.

**Yours sincerely**

.....  
Researcher: Daisy Chasauka

.....  
Study leader: Prof J.C. Jerling