

The effectiveness of routine nutrition assessment in the treatment and care of people living with HIV and AIDS in the Eastern Cape Province of South Africa. A case study of Lukhanji Sub District.

by

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## **DECLARATION**

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Date March 2013

## **DEDICATION**

This assignment is dedicated to Walter my husband and my two beloved sons Tinashe and Tanaka for the moral support, guidance and encouragement for me to attain this qualification and not forgetting my parents, siblings and friends who did bear with me whenever I excused myself from being part of them in their social gatherings.

## ABSTRACT

With the knowledge that HIV and malnutrition are interlinked, a great need for on-going nutritional assessment becomes critical in the treatment and care of people living with HIV and AIDS. In the absences of ARV treatment , people living with HIV and AIDS tend to lose weight and eventually become undernourished whilst ARV treatment is associated with longer life span hence they tend to gain weight becoming overweight or obese.

This study attempted to determine the effectiveness of routine nutritional assessment offered to improve the nutrition status, well-being and quality of life of people living with HIV and AIDS attending HIV treatment and care facilities in Lukhanji Sub District of the Eastern Cape Province, South Africa.

The thesis reports on the findings collected from an interview guide with semi structured interviews from twenty (20) non pregnant adults that consisted of fourteen (14) females and six (6) males living with HIV and AIDS and not hospitalised. To determine the effectiveness of nutritional assessment the study used descriptive methods and convenience sampling.

The study results demonstrated that the routine nutritional assessments being provided to the HIV clients are useful to detect and track body changes and trends to determine the effectiveness of nutrition therapy in slowing the progression of the disease. Furthermore the study showed that the nutrition interventions currently provided at facility site focuses mainly on under nutrition and very little to address over nutrition.

In conclusion this study highlighted to some extent the effectiveness of nutrition assessment in treatment and care of PLHIVs with the limited time and the sample size. Hence, recommendations can be made to improve on this study to determine the effectiveness of nutrition assessment further.

## OPSOMMING

In die lig van die bewese verband tussen MIV en wanvoeding, is voortdurende voedingsassessering noodsaaklik in die behandeling en versorging van mense met MIV en vigs. Sonder antiretrovirale behandeling verloor mense met MIV en vigs gewoonlik gewig, en is uiteindelik ondervoed. Daarenteen word antiretrovirale behandeling met 'n langer lewensverwagting en gevolglike gewigstoename verbind, en is sodanige pasiënte dikwels oorgewig of vetsugtig.

Hierdie studie was daarop afgestem om die doeltreffendheid te bepaal van huidige roetinevoedingsassessering in die verbetering van die voedingstatus, welstand en lewensgehalte van diegene met MIV en vigs by MIV-behandeling-en-sorgfasiliteite in die Lukhanji-subdistrik van die provinsie Oos-Kaap, Suid-Afrika.

Dié werkstuk doen verslag oor data wat ingesamel is met behulp van 'n onderhoudsgids. Semigestruktureerde onderhoude is met twintig (20) nie-swanger volwassenes gevoer. Die respondente het bestaan uit veertien (14) vroue en ses (6) mans met MIV en vigs wat nie gehospitaliseer is nie. Die doeltreffendheid van die voedingsassessering is met behulp van beskrywende metodes en geriefsteekproefneming bepaal.

Die resultate toon dat die roetinevoedingsassessering wat tans aan die MIV-kliënte voorsien word, nuttig is om liggaamsveranderinge en -tendense op te spoor en dop te hou ten einde die rol van voedingsterapie in die verlangsaming van siekteprogressie te bepaal. Voorts dui die studie daarop dat die voedingsintervensies wat tans by die betrokke persele voorsien word, hoofsaaklik op ondervoeding konsentreer, dog weinig aandag aan oorvoeding skenk.

Ten slotte beklemtoon hierdie studie in 'n sekere mate die doeltreffendheid van voedingsassessering in die behandeling en versorging van pasiënte met MIV, met inagneming van die beperkte studietydperk en steekproefgrootte. Aanbevelings kan dus gedoen word om op hierdie studie te verbeter en die doeltreffendheid van voedingsassessering verder te ondersoek.

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## LIST OF ABBREVIATIONS

|       |   |
|-------|---|
| AIDS  | Acquired Immune disease                       |
| ART   | Antiretroviral Therapy                        |
| ARV   | Antiretroviral drugs                          |
| BMI   | Body Mass Index                               |
| CSB   | Corn soya blend                               |
| D4T   | Stavudine                                     |
| ECDOH | Eastern Cape Department of Health             |
| FBP   | Fortified, blended porridge                   |
| HAART | Highly active antiretroviral therapy          |
| HB    | Haemoglobin                                   |
| HIV   | Human immunodeficiency virus                  |
| MUAC  | Mid upper arm circumference                   |
| PLHIV | People living with HIV and AIDS               |
| NACS  | Nutrition assessment, counselling and support |
| NSP   | National Strategic plan                       |

|        |  |
|--------|--|
| NCD    | Non communicable diseases                          |
| TB     | Tuberculosis                                       |
| TDF    | Tenofovir disoproxil fumarate                      |
| SA     | South Africa                                       |
| UNICEF | United Nations Children's Emergency Fund           |
| USAID  | United States Agency for International Development |
| STI    | Sexually Transmitted Infection                     |
| WHO    | World health organization                          |

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## CHAPTER ONE (1)

### THE RESEARCH PROBLEM AND PURPOSE

#### 1.0 Introduction

This paper postulates that people living with HIV and AIDS would definitely benefit greatly from routine nutrition assessment if done in combination, correctly and well-coordinated. Nutrition assessment forms a critical component of HIV and AIDS care and treatment. HIV and malnutrition interrelate in a vicious cycle. For many people living with HIV, the infection leads to or worsens malnutrition through various reasons that includes reduced food intake, increased energy needs, impaired nutrient absorption and nutrient losses associated with frequent and persistent diarrhea. Malnutrition can hasten the progression of HIV, further weakening the immune system, increasing vulnerability to opportunistic infections and reducing the effectiveness of both anti-retroviral therapy (ART) and treatment of opportunistic infections. With ART, HIV and AIDS becomes a chronic disease that entails chronic nutrition management and support. Therefore, nutrition is a vital component of a comprehensive HIV and AIDS program to improve clinical outcomes for people living with HIV and AIDS (PLHIV).

According to the South African Department of Health (2007), the first step in nutritional care is to assess the nutritional status of the person. Nutrition assessment includes the evaluation of nutritional status using anthropometric measures, biochemical, clinical and dietary needs. For and better clinical outcomes all these have to be done in combination. The thesis focuses mainly on the routine nutrition assessment methods provided by the primary health care facilities which informs the nutritional care plan of PLHIVs and contributes to their quality of life.

#### 1.1 Background and Rationale

The South Africa Strategic Plan for HIV and AIDS, STIs and TB 2012-2016 estimates that 5.38 million are people living with HIV/AIDS (PLHIV) and 1.79 million people on ART in South Africa by mid-2011 which is 17 percent global burden.( South Africa National Strategic Plan for HIV and

AIDS, STIs and TB, 2012-2016). HIV infection is believed to be high in populations with high poverty levels. In addition, malnutrition is especially expected in settings where poverty and poor access to care prevail. To cite a single example, the 1999 South Africa food consumption survey showed that children aged 1-3 years were most severely affected in terms of prevalence in stunting and a high prevalence of poor iron and vitamin A status in women of child bearing age (Bekker, 2008). Malnutrition among the PLHIV adults defined as body mass index (BMI) less than 18.5kg/m<sup>2</sup> is likely in low resource communities of the Eastern Cape where lack of food and nutritional information on appropriate diet of locally produced foods exist. In South Africa both HIV and TB infections occur among adult and pediatric populations that already suffer from inadequate nutrition (Bekker, 2008). In these malnourished groups, both TB and HIV infections progress quickly worsening immune deficiency and increasing susceptibility to further infections. (Department of Health, 2007). Opportunistic infections at the same time place PLHIVs at higher risk of developing malnutrition. Without rapid attention, malnutrition and opportunistic infections can heighten disease progression and prognosis. This occurs through mechanisms that include malabsorption, impaired food intake and metabolic abnormalities.

Management of HIV and AIDS demands an integrated approach to the physical, nutritional and health needs of people living with HIV and AIDS (PLHIV). PLHIV have larger caloric needs on average and good nutrition can delay progression of HIV to AIDS. Ensuring PLHIV have the recommended micronutrient and adequate energy based on locally affordable foods should be minimum standard to improve the nutritional status of PLHIV. The operational plan for Comprehensive HIV and AIDS Care, Management and Treatment of South Africa approved by cabinet in 2003 recognizes the importance of nutrition as part of comprehensive package of care for people living with HIV and AIDS (Bekker, 2008).

Provision of appropriate formulated nutrition interventions together with treatment interventions can achieve positive impact in HIV infected adults and children (South Africa National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016). These interventions such as the nutrition assessment, education and counseling as well as provision of food have potential to improve the nutritional status of PLHIV. Government's effort on antiretroviral drug treatment if joined with effective nutrition support interventions to ensure that those on treatment are properly nourished

will increase the positive impact of investing in treatment. For the majority of South African living with the onset of HIV infection, achieving and maintaining a healthy nutritional status is instrumental in slowing the progression of HIV infection, and delaying the time until treatment with ARVs becomes necessary ( South Africa National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016).

## **1.2. Research Problem/ Question**

Information on the prevalence of malnutrition in people living with HIV and AIDS still remains scanty and the implications of malnutrition and HIV has given rise to the need to explore the nutritional assessment interventions provided at facilities and possible solutions to address the malnutrition among the people living with HIV and AIDS effectively in Lukhanji sub - district. The nutritional status among most of the PLHIV in the communities where the researcher works have shown a substantial weight loss during the disease progression worsened. This is exacerbated by the lack of food supplements at the care centers, lack of readily accessible routine nutritional assessment at facility level coupled with the poverty among the families. As noted, nutritional deficiencies in people living with HIV and AIDS begin early and often go unrecognized. Therefore optimizing nutrition may help to delay the progression of HIV infection (Department of health, 2007).

This study therefore hopes to answer the following research questions:

- **Does routine nutritional assessment provided by the health facilities in Lukhanji Sub District help in the treatment and continuous care of the people living with HIV and AIDS?**
- **Does routine nutrition assessment for PLHIVs facilitate prompt treatment and dietary interventions that can help reduce frequency and duration of opportunistic infections as well as prevent weight loss?**
- **What can be done to increase nutrition awareness in HIV positive people who do not know the importance of nutrition?**

### **1.3. Significance of the study**

The study will be of value in various ways:

- The study will give information to implementers and policy makers to improve on service delivery and on the quality of life for the people living with HIV and AIDS hence reduce on the HIV and AIDS mortality rates.
- The study will provide information that will assist Government and policy makers as well as other organisations about possible needs driven nutrition strategies for people living with HIV and AIDS.
- The study will provide information that will strengthen the treatment program because benefits of investing in antiretroviral drugs could be in jeopardy if people living with HIV and AIDS receiving treatment are not properly nourished.
- The study will also highlight the need for further research concerning the benefits of nutritional supplements to people living with HIV/AIDS.
- This study will also help the people living with HIV and AIDS to access the timely nutrition interventions for their benefit and to be better informed.
- The data from this study could be useful to guide the development of effective programs that integrate HIV care and nutrition seriously.

### **1.4. Research aim**

The aim of this research paper will be to determine the effectiveness of nutrition assessment to improve the nutrition status, well-being and quality of life of PLHIVs attending HIV treatment and care facilities in Lukhanji Sub District.

### **1.5. Research objectives**

The objectives of this research paper will be to:

- To analyze the current nutritional assessment interventions provided by Hewu Hospital ARV clinic.

- To establish the current nutrition knowledge, attitudes and practices of the twenty people living with HIV and AIDS.
- To establish the awareness of the 20 people living with HIV and AIDS on nutrition risk.
- To provide suggestions for more needs driven nutrition support programmes that address both under and over nutrition in people living with HIV and AIDS.

## **1.6. Research assumptions**

The data gathered through the questionnaire and other literature is the basis of the study of the effectiveness of routine nutrition assessment for PLHIV. On designing the questionnaire, the following assumptions were made:

- That the available literature does not give enough information for drawing up the recommendation based on the current nutrition interventions provided by the facilities to care and treat PLHIVs.
- That the nutrition assessment currently provided by the facilities influences better clinical outcomes hence quality of life for PLHIV.
- That nutrition assessment if done correctly and in combination will be effective in the treatment and care of PLHIV.

## **1.7. Limitations of the study**

There are three major limitations to this study. Nutritional status is determined by several factors such as environmental, social and economic which are not considered in this thesis due to time, human and cost constraints of conducting such wide research. The time of study was also limited to provide sufficient follow up on the subjects. Furthermore the sample size was very small (n=20).

## **1.8. Structure of the Thesis**

In order to meet the stated study objectives, the thesis has been structured as follows:

## **CHAPTER 2: LITERATURE REVIEW**

Nutritional assessment is a critical component for nutrition management and support in the care and treatment of PLHIVs. This chapter reviews, inter alia, the theoretical background to the area of study as advocated and acknowledged by other academia's, scholars, researchers and international organizations such as USAID and UNICEF. The various contributions made to the field of nutrition and HIV and AIDS and nutrition management for PLHIVs is discussed. Where possible, new ground will be broken as the author's contribution towards the development of the subject – effectiveness of routine nutrition assessment in the treatment and care of PLHIVs.

## **CHAPTER 3: THE RESEARCH METHODOLOGY**

In this chapter, methods of collecting data and designing research instruments are discussed. A sample of the questionnaire used for data collection is also provided. The sample size and design form a contribution to this chapter. Inherent in the chapter is a closer look at the research methods chosen and critical review of its process.

## **CHAPTER 4: THE RESEARCH FINDINGS AND DISCUSSIONS**

This chapter looks at the current routine nutrition assessment provided to the PLHIVs: anthropometric, dietary intake, nutritional related symptoms, food accessibility and availability, prescription and non- prescription medication, TB infection history, CD4 cell count and client records and guidelines. This chapter further discusses the findings based on the stated hypothesis.

## **CHAPTER 5: CONCLUSION AND RECOMMENDATIONS**

This chapter will conclude the thesis by drawing major conclusions and prescribing recommendations.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter seeks to discuss the contributions other researchers have made in the field of nutrition and HIV and AIDS. The thesis considers the extent to which these concepts influence the nutritional management of people living with HIV and AIDS in the treatment, care and support programs

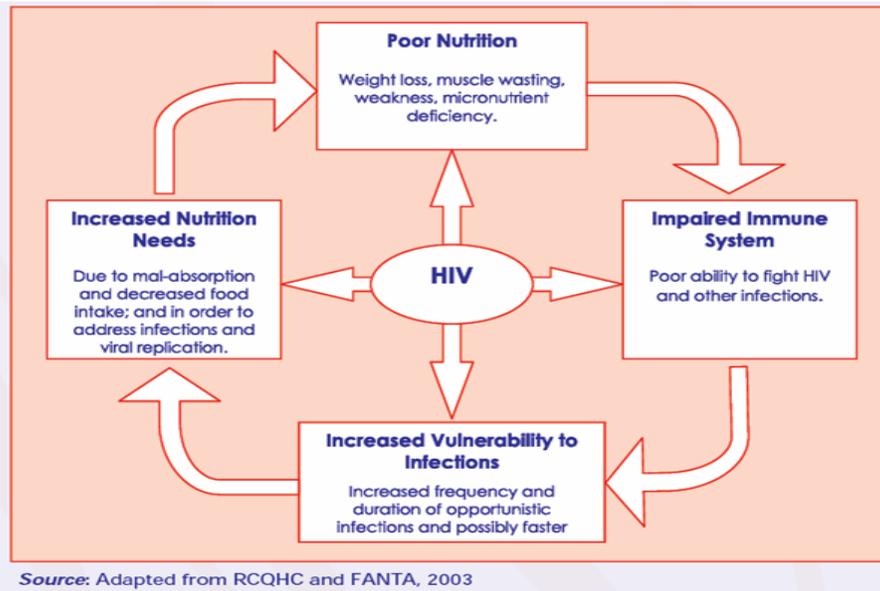
#### 2.1 Information on HIV and Nutrition

The first case of HIV in 1985 was reported as “slim disease” in Uganda (Serwadda et al.1985). In the absence of Antiretroviral Therapy (ART), the natural AIDS history indicates that the people will lose weight and eventually become wasted or severely underweight (WHO 2007 and Flowers 2001). Though wasting was common early in the HIV epidemic, it has become less common with the introduction of highly active antiretroviral therapy (HAART). With exemption of peripheral lipotrophy linked to certain types of antiretroviral medications, there has been a restoration to health occurrence leading to deterioration in wasting and shifting to more overweight. This is because with the treatment and good nutrition PLHIV are living longer and gaining weight similar to the non HIV population.

According to the Joint United Nations program on HIV and AIDS 2008 report morbidity and mortality due to HIV/AIDS in developing countries remain unacceptably high, in spite of progresses in care for human immunodeficiency virus (HIV) infection and increased funding for treatment. The report further elaborated that the key contributing factor is that more than eight hundred people remain chronically undernourished globally, and the HIV epidemic largely overlaps with populations already experiencing low diet quality and quantity. People living with HIV and AIDS face not just sickness but also impaired productivity, declining income and increasingly difficult choices among essential but competing expenses, such as food versus health care or schooling versus rent. (Oldewage, 2006).

The physiological complications of progression of HIV infection are combined by the problems linked with poverty, because malnutrition translates into insufficient consumption of a diet of adequate quality and quantity to boost immune function and support medical therapy (WHO). There is a great body of evidence that supports that inappropriate food intake adversely impacts immune function (Chandra, 1996). Deficits in micronutrient such as Vitamin A, C, zinc and selenium impair the immune function and protein deprivation decreases many body functions including the production of inflammatory mediators that are needed to fight infection. (Chandra, 1996). Some researchers on micronutrient supplementation indicates that it can slow disease progression (Fawzi 2004) reduce mortality ( Jiamton 2003, Range 2006), lower viral loads and decrease gastrointestinal effects (Fawzi 2004). Some studies do not show the expected effects. Friis (2005) noted that the same micronutrient may be beneficial in some situations while having adverse effects in others, more evidence is required to establish optimal micronutrient intakes to reduce progression of HIV to AIDS and mortality.

HIV infection reduces the efficiency of nutrient absorption and utilization partly because of frequent diarrhea due to compromised immunity ( Piwoz E. and Preble, E. 2000). Malabsorption of macronutrients is common and poorly affects the absorption and utilization of fat soluble vitamins, compromising immunity and worsening nutrient deficiencies (Tang AM, et al, 2005). Infections and nutritional deficiencies cause an increase in levels of pro-oxidants that result in oxidative stress, which may indirectly accelerate HIV replication (Piwoz, 2000). The relationship of HIV and malnutrition is referred to as a vicious cycle as illustrated by the diagram below:

**Figure1: Vicious Cycle: Malnutrition and HIV**

According to Preble, (2005), metabolic changes including changes in insulin and glucagon levels, result from both reduced food intake and the immune response to infection and may lead to muscle wasting. People living with HIV and AIDS require higher protein requirement compared with their non - infected colleagues because HIV infection increases resting energy expenditure as a function of HIV load. ART in itself increases resting energy expenditure individually of viral load, further contributing to weight loss. Weight loss (BMI less than 16) is itself a significant, independent risk factor for AIDS related mortality. (Mangili A, 2006).

A ground breaking 2006 study found that moderate to severe malnourished people starting HAART experienced a six fold higher hazard ratio for death. Those starting Antiretroviral Therapy (ART) who was moderately to severely malnourished were twice as likely to die as those who were not malnourished. Malnutrition decreases survival in patients starting ART and HAART for several possible reasons: impairment of immune reconstitution and in turn a prolonged period of opportunistic infection risk adverse effects on drug absorption, lower threshold for drug toxicity and or decreased physical function. (Paton.NI. HIV Medicine, 2006).

According to Sanne et al (2005), under nutrition was found to increase the possibility of developing hepatic toxicity to some of the ARV especially nevirapine. Some studies have also revealed that the absorption and effectiveness of drugs is supported by food and bigger appetite is

an intended and anticipated effect of drug therapy, one that is necessary to reverse loss of body mass and to encourage recovery and improved immune function.

As HIV infection progresses, it causes a catabolic state and increased vulnerability to other infections, which are combined by lack of caloric and other nutrient intake, leading to progressive worsening of malnutrition (Piwoz, 2000). According to Zachariah, some studies have also highlighted that infections such as tuberculosis (TB) have a negative interaction with the HIV by contributing to HIV related weight loss. In Malawi, for example, low BMI was predictive of early death due to TB, and the mortality risk increased with the patient's degree of malnutrition (Zachariah, 2002). Under nutrition was associated with an elevated risk of the person developing TB in Tanzania (Venkatesh, 2005), and lower BMI was associated with increasing severity of pulmonary TB and higher plasma HIV load in another Malawi study (Van Lettow, 2004a and 2004b).

Complaints on weight loss among patients reporting that they are trying not to lose weight is common among people living with HIV and AIDS. Such weight loss is of great concern, as even a 5 percent weight loss over 4 - 6 months markedly increases the risk of opportunistic infections and death (Tang, 2005, Wheeler, 1998). These evidences highlight further the particular need to ensure adequate caloric and multivitamin intake in people living with HIV and AIDS adults and routine screening of TB and other opportunistic infections.

In contrast, higher Body Mass Index (BMI greater than 25) and weight gain appear to be protective against AIDS – related disease progression and mortality. Higher BMI among people living with HIV and AIDS at study enrollment was associated with a significantly longer lifespan compared with people living with HIV and AIDS with lower BMIs, after controlling for baseline CD4 count in the Gambia (Van der Sande, 2004) and rural Malawi (Zachariah, 2006). Higher BMI, during the study enrollment was consistently associated with slower disease progression and lower mortality even at obese BMIs after controlling for prior CD4 count, viral load, and treatment in a large developed country prospective study (Jones et al. 2003). Higher BMI may not necessarily be good for all HIV – positive people; however a recent study in Zambia found the likelihood of mother to child HIV transmission to increase with higher maternal BMI (Banda, 2007), but these findings have yet to be replicated. A certain study established out that being overweight or obese are now more prevalent than wasting since the introduction of the ART.

Many people living with HIV and AIDS in resource limited settings already suffer “primary malnutrition. In the hyper epidemics of sub Saharan Africa, some of the populations at greatest risk of contracting HIV are the same populations at high risk of food insecurity (Gillespie 2007). According to Scarlatti et al (2004), food insecurity in itself is a risk factor for HIV/AIDS transmission.

HIV positive individuals may eat foods that contain a high amount of refined carbohydrates, saturated and trans-fats and calories with little micronutrient value due to the lack of nutritious foods accessible to low income. As a result it seems obese clients with the disease characteristics of general obese populations are now being seen more frequently. Clearly there is evidence that confronting malnutrition and food security in the HIV/AIDS community is necessary to successfully treat the disease (Gillespie S,et al,2007). In addition it is imperative that increasing access to HIV medications, organizations must also provide nutritious safe and sustainable food assistance.

## **2.2 Nutrition interventions to treat malnutrition in PLHIV Adults**

Good nutrition care starts with good assessment (measurement and classification) of nutritional status. Nutrition assessment is a critical first step in improving and maintaining nutritional status and this include and not limited to anthropometric, biochemical, clinical, dietary and in some cases water and sanitation and food security. According to FANTA-NACS technical note, (July 2012) nutrition assessment can: identify medical complications that affect nutritional status, track weight trends, and detect diet habits that make it difficult to improve health or that increase the risk of disease, inform nutrition messages and counseling. Furthermore, establish a framework for an individual nutrition care plan, which specifies nutrition goals and interventions, feasible changes in behavior, and practices to meet those goals. Nutrition assessment is usually part of broader clinical assessment by health care providers at facility which informs other interventions such as nutrition programs.

Such timely interventions can only be feasible if free-living HIV positive adults are routinely screened and assessed for malnutrition. Unfortunately, this important care is not readily available to all people living with HIV and AIDS because of limited resources. South Africa is clearly one of the several Sub – Saharan African countries with high proportions of people living with HIV and

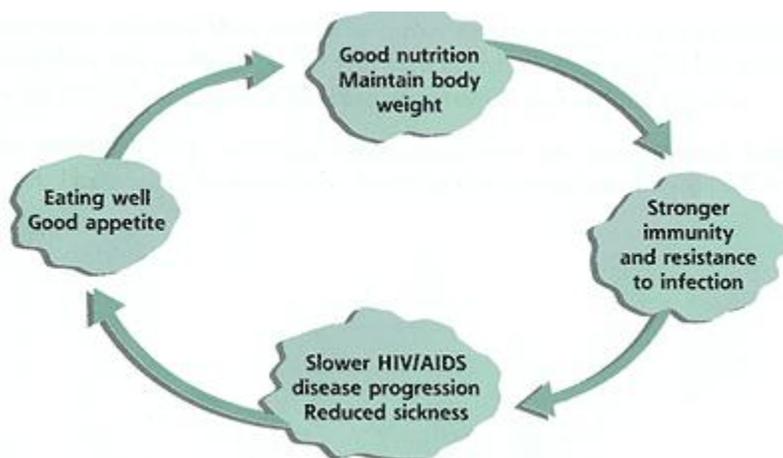
AIDS, with the national HIV prevalence of 16.9% for adults aged 15 to 49 years based on the South African National HIV survey 2008 (Bekker, 2008). There is a strong government commitment to the treatment, care and support of people living with HIV and AIDS as evidenced in part by government's provision of antiretroviral drugs and food supplements to qualifying clients (South Africa National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016).

However, even with these measures in place, there are gaps that need to be addressed. In particular, there is little information on the nutritional status of people living with HIV and AIDS, despite the critical role of nutrition in disease progression (South Africa National Strategic Plan for HIV and AIDS, STIs and TB, 2012-2016). Although WHO recommends that people living with HIV and AIDS have full nutrition assessment on intake to medical services coupled with nutrition counseling and education; in poor settings such as Amathole district, issues such as stigma still push people away from receiving the full nutrition support until they are admitted in hospital with severe wasting.

### 2.3 Benefits of the Nutrition Interventions to PLHIVs

Good nutrition can help to extend the period when the person with HIV/AIDS is well and working and at the same time vital to help maintain the health and quality of life of the person suffering from AIDS as illustrated below.

**Figure 2: Diagram on the relationship of good nutrition and HIV and AIDS**



Source: adapted from Piwoz and Prebel, 2000.

Malnutrition and opportunistic infections can worsen disease progression and prognosis through mechanisms that include a lot of factors such as malabsorption among others if not attended too quickly. Routine nutrition screening can facilitate early treatment and dietary interventions, which in turn can reduce the frequency and duration of opportunistic infection as well as prevent weight loss. Research observations that have been carried out earlier on suggest that unintentional weight loss can progress even when nutrition interventions are provided. However, nutrition interventions early in the disease course or before the development of opportunistic infections can prevent unintentional weight loss successfully. (Chlebowski, 1995).

Since multiple studies have established that malnourished adults with HIV are at an elevated and progressive risk of HIV disease progression and mortality as BMI decreases, especially below 18.5, WHO recommends providing supplementary feeding for mild-to-moderately malnourished adults (BMI <18.5), regardless of HIV status. The most common and cheapest supplementary foods are micronutrient-fortified, blended flour (e.g., corn-soy blend or CSB) that can be prepared as porridge, but other forms (e.g., biscuits or pastes) may be used. Severely malnourished adult patients (BMI <16) should be provided with a therapeutic food that is formulated to be nutritionally equivalent to the therapeutic F-100 milk. Therapeutic or supplemental feeding should be continued until the patient's BMI is stabilized above 16 or 16–18.5, respectively, for two-to-three consecutive months.

There is little or no information on the nutritional status for PLHIVs, despite the critical role of nutrition in disease progression and the routine nutritional screening is not readily accessible to people living with HIV and AIDS due to the shortage of Dieticians or Nutritionist in the government clinics, primary hospitals and community health centres. Healthy eating guides for people living with HIV and AIDS and nutrition and HIV/AIDS guidelines for providers caring for the people living with HIV and AIDS have been developed to address some of these challenges; their utilization and impact, however, remain unknown. To some extent the utilization of these aids can be facilitated by the awareness of people living with HIV and AIDS of their nutrition risk.

## CHAPTER THREE

### RESEARCH DESIGN AND METHODS

The methodology of the study was influenced by the phenomenon under investigation and required that participants give personal experiences and accounts on nutrition.

#### 3.0. Subjects

The study was conducted on twenty (20) adults, of which fourteen (14) were females and six (6) were males aged twenty- two (22) years and above. These were free living (not hospitalised or bedridden) non pregnant or lactating adults living with HIV and AIDS (PLHIV). The subjects were chosen because of their HIV status, the ability to attend outpatient antiretroviral (ARV) clinic and agreed to undergo thorough nutritional assessment that includes 24 hour recall, clinical signs and anthropometric measurements.

#### 3.1. Research method

Qualitative research methods were utilised in this study to capture descriptions of the nutritional assessment interventions currently provided to the people living with HIV and AIDS attending the Hewu hospital ARV clinic, Lukhanji Sub-District. Thyer, (2001:257) explains that ‘a qualitative research aims at describing, making sense of, interpreting or reconstructing in terms of the meanings that the subjects express’. This research is the most suitable method where data collected is in the form of stories of the respondents’ experiences.

For the purpose of this study, the participants had their body weights measured to the nearest 0.1kg using a secca, scale 2000 and their heights measured to the nearest 0.1cm using the stadiometer attached to the secca scale. The weight was taken three times throughout the period of the study except height which was taken once in the first month. The weight and height of the participants were used to calculate the body mass index (BMI) in kg/m<sup>2</sup> to determine the nutritional status of the participant. The BMI was calculated every month after which the averages were calculated and

used. The BMI was classified as underweight (BMI<18,5kg/m<sup>2</sup>), healthy weight (18.5-24.9kg/m<sup>2</sup>) and overweight (BMI > 30kg/m<sup>2</sup>). The participants also reported their habitual food intake in the past 24 hours. The subjects were then asked questions to gauge from their responses their understanding on the importance of nutrition assessment and factors that causes malnutrition and how they feel since it was a monthly exercise.

### **3.1.1. Ethics Approval**

Approval for the study was obtained from the Research Ethics Committee, Human Research ( Non-Health) , University of Stellenbosch ( Ref No:427/2010) as well as from Mrs Baba ,the Sub District Manager Lukhanji Sub District , Eastern Cape and Mrs Qwabe the Hewu hospital Manager, Lukhanji Sub District.

### **3.1.2. Data Collection**

Data was collected using an interview guide (see Annex 1) with semi structured interviews and document analysis for the purpose of this study. Written informed consent was obtained from participants prior to the start of all interviews (see Annex 2).The guide was completed by the researcher with the help of the health care worker, where necessary the healthcare worker filled in the responses. To ensure comparability the interview guide was translated in the local language which is Xhosa. The first part addressed the subject's demographic characteristics, such as name, (not real names), age, gender and date of birth and the second part captured the anthropometric data and the other sections addressed the various interview questions. To gather the data the interview guide captured the following:

- i. Anthropometric information,
- ii. Weight loss,
- iii. Nutritional related symptoms,
- iv. Food availability and access,
- v. Prescribed and non-prescribed medication,
- vi. Stages of HIV infection and treatment,
- vii. Dietary Intake.

For the purpose of this study, patient records that gave information on the patient's nutritional status trends and how they impact on treatment and care were reviewed. The records had information on nutrition assessment, medications being taken, prescribed drugs, CD4 cell count, vitamin and any mineral supplements for the time the patients was enrolled in care. The researcher also reviewed the nutrition assessment tools and guidelines being used by the facility to check if they are be utilised and are updated.

## CHAPTER FOUR

### RESEARCH FINDINGS

#### 4.0 Introduction

This chapter presents the result obtained from the study and the discussions based on the hypotheses that motivated the study. The purpose of the study was to find out the effectiveness of nutrition assessment interventions provided at facility level. Besides the anthropometric measurements most of the information collected was reported information by the participants. The results are presented in the following thematic areas: anthropometric, dietary intake, nutritional related symptoms, food accessibility and availability, prescription and non- prescription medication, TB infection history, CD4 cell count and client records and guidelines.

#### 4.1 Results

##### 4.1.1 Study population

A total of twenty (20) HIV free living non-pregnant or lactating adults aged twenty-two (22) years and were included in the study. These were chosen based on their HIV status, the ability to attend outpatient antiretroviral (ARV) clinic and agreed to undergo thorough nutritional assessment. Of these participants, fourteen were females and six were males. The females had a significantly lower age (mean age 30.5 years) than the males (mean age 42 years). Convenience sampling was used for this study.

##### 4.1.2 Anthropometrics

Few of the participants reported experiencing weight loss for the 3 months and for those who did it was very insignificant (0.5kg). The body mass index (BMI) for both genders ranged between underweight to obese (15kg/m<sup>2</sup> – 41.1 kg/m<sup>2</sup>). The BMI variables were significantly different in both genders with females having significantly high BMIs as illustrated in the table below. Portia

reported that her high BMI could be slightly linked to dietary intake but it could have been contributed to the treatment and that she had a piece of mind. Throughout the study period only one male had significantly very low BMI (less than 16kg/m<sup>2</sup>) and one female with a very high BMI greater than 40Kg/m<sup>2</sup>. Participants who presented low BMIs also reported gastrointestinal symptoms, episodes of diarrhoea and vomiting as well as lack of appetite. Some of the weight loss reported was also related to stress in addition to inadequate food intake and gastrointestinal problems.

**Table 1: Body Mass Index variables for the study group (n=20) for the three months**

| Name              | Gender | Month 1 | Month 2 | Month 3 |
|-------------------|--------|---------|---------|---------|
| Thembi Cela       | F      | 22.3    | 21.9    | 18.9    |
| PD                | F      | 23.8    | 23.5    | 23.2    |
| Zanele Makapela   | F      | 21.4    | 21.0    | 21.3    |
| Vuyelwa Bam       | F      | 30.5    | 30.4    | 30.4    |
| Nokholekile Msutu | F      | 27.1    | 26.9    | 26.3    |
| Babalwa Kape      | F      | 24.2    | 24.4    | 24.0    |
| Zukiswa Ngcai     | F      | 31.1    | 30.9    | 30.4    |
| Paulos MK         | M      | 17.4    | 17.0    | 16.5    |
| Thaba             | M      | 22.1    | 22.4    | 22.9    |
| Portia Kamati     | F      | 40.7    | 40.6    | 41.1    |
| Nkosinathi Jek    | M      | 18.0    | 17.6    | 16.6    |
| Mondli Livi       | M      | 15.8    | 15.4    | 15.0    |
| Mzuvukile         | M      | 20.6    | 20.3    | 20.5    |
| C Zwelinjani      | F      | 21.3    | 21.1    | 21.5    |
| Douglas Sizakele  | M      | 24.1    | 24.2    | 23.6    |
| Sunday            | F      | 26.8    | 26.6    | 27.4    |
| Nzwaki            | F      | 27.4    | 27.2    | 28.0    |
| Thabisa           | F      | 29.8    | 29.2    | 29.2    |
| Pumula Zondi      | F      | 17.8    | 17.2    | 17.1    |

|          |   |      |      |      |
|----------|---|------|------|------|
| Thobeka  | F | 27.7 | 28.3 | 29.1 |
| Nomkumbi |   |      |      |      |

#### 4.1.3 Dietary Intake

The participants reported their usual food intake with most of them reporting that they had at least two meals a day. It was apparent that most of the participants missed one or two meals a day and very few reported that had three or more meals. Most of the participants understood that it is important to eat a variety of foods though they were unable to eat vegetables, fruits and meat or fish regularly because they are expensive and scarce. Paulos mentioned that whilst it is important to consume a variety of foods his favourite food is papa (mealie meal porridge) and Amasi (sour milk) and he eats this almost every day. In addition, Paulos reported that he does not enjoy food that much, “My best food is mngqusho (samp), umphokoqo (african salad) and Amasi) and I like to eat these every day”, he stressed. Those who reported consumption of vegetables had a vegetable garden or could afford to buy the vegetables. The subjects reported that at times enriched the food with peanut butter, milk or increase on eating times per day or increase the amount of food to increase energy intake. Only two of the participants reported consumption of beer occasionally though they did not specify quantities. All the participants reported that they drink treated water regularly. Reports on consumption of refined carbohydrate foods were common with most of the participants.

#### 4.1.4 Nutritional related Symptoms

Loss of appetite was the most clinical feature most predominant in both genders except for one male who reported to have had a very large appetite. Nausea, vomiting, tiredness and diarrhea occurred in both genders although nausea and tiredness were most prevalent among the females. Diarrhea was most prevalent in males. Few of the female participants reported experiences with constipation and bloating. Sunday reported that she often experience constipation and when it happens she uses Aloe drink as remedy. Food intolerances were experienced to some degree and

one of the male participants reported that he dislikes food total of which he eats one meal a day and eat very little.

#### **4.1.5 Food accessibility and availability**

Most of the participants reported that they had difficulties in accessing food such as meat, vegetables and fruits because they are expensive. Some of the participants reported that they have gardens hence were able to access vegetables such as spinach and carrots. Starchy foods such as mealie meal and potatoes were easily accessible by all subjects. Very few reported having gone hungry for a day due to lack of food because they did not have money to buy food.

#### **4.1.6 Prescription and non- prescription medication**

During the time of study all of the participants were on anti-retroviral treatment (ARV) with some being on treatment for more than two years and very few had started within a year. Most of the participants were on zidovudine, lamuvidine, ritonivar, efavirenz, tenofovir and with a few on D4T and niverapine. Very few reported the use of micronutrient supplements such as vitamin B complex and folic acid whilst others reported the use of bacterium.

#### **4.1.7 CD4 Cell Count**

For the time of the study, two females and one male had a significant low CD4 cell count (109, 193 and 114 cells/dl respectively) whereas one male and one female had significantly very low CD4 cells (90cells and 46 cells/dl respectively). The other participants had CD4 cell count of above 250cells/dl and very few did not know their CD4 cell count and it was also missing information in their record.

#### **4.1.8 TB history**

Of the twenty participants only four reported to have been diagnosed and treated for TB in the past three to five years.

#### **4.1.9 Patient Records and Guidelines**

Most of the nutrition information was missing in the client records such as information on weight, BMI, MUAC and height, HB levels.

#### **4.2 Discussion**

The purpose of the study was to determine the effectiveness of nutrition assessment in the treatment and care of HIV clients. The results demonstrated that nutrition assessment interventions being provided to the HIV clients at primary health care centre in Lukhanji to some extent are effective though more work still needs to be done to check on the effectiveness. This is inconsistent with other researchers who also felt that more work has to be done in terms of determining the effectiveness of nutrition assessment.

It is also important to note that the findings of the study needs to be interpreted with the understanding that the study was limited in several aspects that included the following small sample size and short duration of follow up. Therefore the findings cannot be generalised because the sample size was small (n=20) with men underrepresented in this study (n=6) compared to their female counterparts (n=14). This could be due to the fact that females frequent the health facilities for care and support services more than the males. Furthermore, the follow up period for the clients was very short to actually check on effectiveness. The other contributing factor could be the issue of no baseline data on the weights of the client before starting on ARV.

Nutrition assessment is a basis of HIV treatment, care and support that has been recommended by main international guidelines including South Africa guidelines. In consistent with other researchers and literature review this study also showed that to some extend nutrition assessment plays a pivotal role in the treatment and care of PLHIV and if provided comprehensively it is effective. The study also showed that the nutrition assessment provided had short comings since it was mainly emphasised on anthropometrics that included weight and height taking and calculating of BMI, 24 hour recall dietary history and very little on clinical signs and socio economic status to determine

the nutritional status of the person. This also highlights that services are implemented individually not in combination with others.

WHO classifies nutritional status for those living with HIV and AIDS as BMI less than 18,5kg/m<sup>2</sup> as moderate under nutrition and a BMI less than 16kg/m<sup>2</sup> as severe under nutrition. Although BMI is commonly used to define nutritional status in adults it does not indicate variations in fat and fat free muscle and in cases where oedema is present it is not reliable. In this study most of the clients had BMIs above 18,5kg/m<sup>2</sup> with some (n=7) being overweight or obese especially among women except one male who had very low BMI less than 16kg/m<sup>2</sup> and one female who had a low BMI of 17.3kg/m<sup>2</sup> on average for the 3 months. The high BMIs could have been attributed to by the treatment or could have been the presence of oedema and lipodostrophy that was not checked in in this study.

The findings of the study highlighted that women were of normal weight to overweight whereas the males were under or normal weight. This could be due to gender differences or the reason that, culturally women are often the ones who decide on what to eat and prepare the meals whereas the males are on the receiving end (men may not make decisions on meals). From the literature reviewed and the findings of the study it is evident that BMI as a proxy measure of malnutrition in adults is a strong predictor of underweight and overweight in PLHIV adults which emphasizes the importance of nutrition assessment from a preventive viewpoint. The study also demonstrated that overweight or obese is also prevalent among the sampled participants conforming the notion of underweight co- exists with overweight among the PLHIV clients.

The findings suggested that participants who had low BMIs below 18,5kg/m<sup>2</sup> reported or experienced changes in dietary intake, gastro- intestinal problems and opportunistic infections compared to those with normal BMI or BMI greater than 18,5kg/m<sup>2</sup>. This is in line with the literature reviewed that under nutrition aggravates opportunistic infection as highlighted by the study findings.

Although most of the literature reviewed that most PLHIV especially with low BMI lose weight this was a bit different with this study. Most of the weight loss that was reported on by the

participants was very insignificant and it was not potential loss that required intervention. On average the participants reported a weight loss of 1kg in the three months and mostly it was due to depressed appetite from secondary infections such as mouth sores and diarrhea. It is very crucial to know the weight or clothes size for the participants before starting ARV's and also assessing the weight monthly or after three months depending on the condition. Since all the participants were already on ARVs it could have been better to get to know about their baseline weight before starting ARVs from the records to compare with the current. This was also the same with weight gain because it was not very clear since we did not have a baseline weight before start of ARVs.

However, a lot of literature or studies have a great deal on under nutrition and HIV; a few studies have addressed HIV and overweight. From these study findings it can be claimed that overweight and obesity are increasing especially among women and half of the women who participated in the study (n=7) were either overweight or obese. These findings are also in consistent with what Prentice (2006), Singh et al. (2007) that the experience of prevalence growth on overweight increasing is common in developing countries in which obesity and related non communicable diseases are on the rise, co-existing with under nutrition, over nutrition, and related infectious diseases which is the case with South Africa.

WHO recommends that PLHIV maintain a normal balanced food intake of 70% carbohydrate, 10-13% protein and 16-18% fat. This can be reached through daily consumption of starchy staples with cooked pulses, nuts and nut butters, fat and oil, fruits and vegetables. Animal protein should be added when affordable (WHO/WFP, 2008). From the study participants' diets were mainly starch based and inadequate in meat, fruit and vegetable intakes because of they are expensive to get. This can also suggest participants could also have been micronutrient deficiency although the study did not assess micronutrient critically besides the clinical signs. The interventions currently provided depend on clinical signs to pick micronutrient deficiencies and drawing of blood for HB to check anemia. It could be likely that those with normal to high BMIs can be missed on macronutrient deficiencies "Hidden Hunger" since micronutrient deficiency is strongly associated with underweight or low BMI.

Most of the participants (n=14) reported that at least they had two meals a day and no snacks in between which can be an indicative of inadequate energy intakes for PLHIV as recommended by the WHO. It can be argued that the dietary observation reported in this study will most likely to be an overestimate or underestimate because sometimes clients might tell you what you want to hear than the actual situation. 24 hour recall is a single habitual food intake recall of which the accuracy of the short durations of recall may not reliably capture the long term dietary trends. This study also demonstrated that 24 dietary history cannot be used alone because it is less reliable compared to food frequency records and also the reported dietary intake observations may under or overestimate the dietary intake of those who routinely skip meals for varied reasons.

In this study, food security was indirectly assessed and the findings revealed that food security is likely a problem in most of the participants. Some participants reported that they went hungry for a day and some skipped a meal as coping mechanisms. These findings illustrate the extent of poverty among PLHIV and also that Eastern Cape Province has high poverty rates (NSP 2012-2016). Very few (n=5) reported to be employed or having a source of income which makes it very difficult to secure and provide food. Food intake was also a challenge with some of the clients who reported changes in the amount and type of food they eat compared to what they used to eat before being diagnosed with HIV or being on treatment. Whilst the findings are indicative of food insecurity, there is need for further studies with indicators that assess food security as part of the nutrition and dietary screening to guide formulation of comprehensive and effective nutrition interventions for PLHIVs.

Food insecurity can have serious implications for adherence to HIV treatment especially to the poor and among the studied group, food availability and security was one of their immediate and critical concerns. A study in Rwanda (Au et al, 2006) found out that fear of the medication increasing the patient's appetite without having enough food was a major obstacle in accepting and adhering to ART. The study also found out that participants who were food insecure were referred to other food organizations for food parcels or to Social Department for grants application.

As cited in the literature review HIV increases metabolic needs, reduces appetite and dietary intake and interferes with digestion and absorption. The findings of this study also illustrated that those

participants who had a BMI less than 18,5kg/m<sup>2</sup> reported on weight loss, gastrointestinal problems, diarrhea, vomiting and loss of appetite. Literature has also stated that there is a strongly significant relationship between low BMI and under nutrition with gastrointestinal problems and opportunistic infections.

The findings of this study also demonstrated that HIV treatment with nutrition have positive benefits for PLHIV in improving quality of life and prolonged life. This is also demonstrated in the findings of Van der Sande et al, 2004, Zachariah et al 2006, who mentioned that though BMI among PLHIV is associated to longer life span, BMI levels that are too high can also contribute to treatment complications for HIV hence the need for routine nutrition assessment to prevent such cases. Some of the participants who have been on treatment for more than 2 years had BMI up to 41,1kg/m<sup>2</sup> which is super obese and this can open up a new study to find out if this was due to dietary or complications due to medication. Literature has also cited that use of ART could lead to lipodystrophy and increases in BMI among ART users. This cannot be ruled out as a possibility in this study since lipodystrophy was not critically assessed especially with very high BMI. Bentley et al. (2005) highlighted that PLHIV's BMI especially women can be affected by ART or other changes such as changes in eating habits to refract speculation about their HIV status upon learning about their HIV status. Routine nutrition assessment has been of paramount importance in managing such clients.

As other studies have cited that nutrition assessment is useful or helps in deciding on whether to initiate the client on ART and HAART medications, these medications also carry particular risks especially among the underweight as most treatment regimens were designed for people of normal body mass (thus a BMI of equal or greater 18.5kg/m<sup>2</sup> according to WHO standards). This study also demonstrated that anthropometric assessment of PLHIV is important because some participants who were on ART treatment D4T were changed to TDF due to high BMIs of above 28kg/m<sup>2</sup>. Some of the participants reported that the high BMI could have been contributed to by the treatment they were taking and this can be supported by the findings of Sanne et al 2005, in a South African study using nevirapine, where two underweight patients died of hepatic failure and others suffered from hepatotoxicity. Furthermore, some of the treatment regimens have shown to contribute to or

worsen overweight or obese and related non communicable diseases among PLHIVs in some studies and this could be true with the female studied.

The literature reviewed stated that improved nutritional status limit the occurrence of side effects of ART treatment. This was evident in this study because participants who had a normal BMI did not complain on the side effects of ARV, only those with a BMI less than 18,5kg/m<sup>2</sup> and very few with a BMI greater than 25kg/m<sup>2</sup>. It is hypothesized that ART reduces HIV associated weight loss, wasting and opportunistic infections such as TB by enhancing the immune system, decreasing viral load and this was true for this study because the clients who had high CD4 cell count weight loss was not an issue to these clients and none of the clients reported to have been diagnosed TB in the year of study. This was according to Raiten DJ, Grinspoon S, Arpordi S, nutritional consideration in the use of ART in resource limited settings (paper number 6) in consultation on the Nutrition and HIV AIDS in Africa: Evidence lessons and recommendations for Action Durban, South Africa, WHO 2005.

This study also showed that the nutrition interventions were nurse driven with limited capacity and this has a negative outcome on the quality of the services. Information such as BMI, MUAC, weight, HB levels, CD4 count and treatment regiments were missing in some of the clients' records and this will make it difficult to follow up on such clients. Furthermore, the participants highlighted that they only receive counseling if they were underweight because the nurses are overwhelmed to counsel every client.

In conclusion this study highlighted to some extent the effectiveness of nutrition assessment in treatment and care of PLHIVs with the limited time and the sample size. Hence, recommendations can be made to improve on this study to determine the effectiveness of nutrition assessment further.

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATIONS

#### 5.0 Conclusion

From the findings, nutritional assessment should be considered as a cornerstone in the treatment and care of PLHIVs in all treatment and care settings facilities. This study provided information that nutrition assessment, if provided comprehensively is effective in the treatment and care of PLHIV. The study also showed that nutritional assessment of PLHIVs are necessary because they experience changes in body composition, reduced weight and body cell mass and even fat accumulation, morbidity status that may affect eating and food utilization and food intake especially before treatment but with treatment it is reduced. In addition the study showed that nutrition assessment measurements are conducted to identify and track body changes and trends to determine the effectiveness of nutrition therapy in slowing the progression of the disease, offer tailored treatment and management based on the assessment results. It can be concluded that PLHIVs should be nutritionally assessed regularly preferably monthly depending on their status and stage of infection and records kept to detect changes as quickly as possible.

It is clear from the literature reviewed; other studies and the findings of this study that nutrition assessment, if provided holistically, helps people receive appropriate treatment, care and nutritional support according to the WHO standards. Hence, screening for nutritional status and assessments of dietary intake should be encouraged routinely in HIV treatment and care settings for adults and even children.

In managing clients holistically facility healthcare workers need to be knowledgeable of the various guidelines and protocols to be followed and the nutritional requirements the clients they are serving. The mandate of WHO of nutrition interventions equity and effectiveness could only be sustained through knowledgeable health care workers. At the time of the study food supplements used to address moderate malnutrition were out of stock which also illustrates

some of the challenges involved with the nutrition care and treatment of PLHIV that could also affect the effectiveness of nutrition assessment.

From this study, it can be established that the nutrition interventions currently provided at facility site focuses mainly on under nutrition and very little to address over nutrition. This can also open up another avenue of research to explore more on what can be done to overweight clients given that some of the participants were overweight. It has also been evident from other studies and literature reviewed that providing good nutrition can contribute to a person's wellbeing at all stages and prolong life.

Although this study aimed at finding out the effectiveness of the nutrition support provided to adult PLHIVs at facility level which did not come up clearly, the evidence of effectiveness of the nutritional support still remains limited. It is therefore, highly recommended that further adequate and well controlled studies be conducted using a different research design, bigger sample size and followed up longer at least one year to provide more information, measure uptake, quality and effectiveness of the nutrition services. Therefore this thesis can be developed more for further research.

## **5.1 Recommendations**

Although the generalisation of the results should be cautioned against, the study supports the need for comprehensive effective nutrition assessment for people living with HIV and AIDS in South Africa to provide sound treatment and care. The following recommendations can be considered:

- These findings can directly assist South African Eastern Cape Province Department of Health (SA ECDOH) to monitor the roll out of HIV nutrition related support services in accordance with the national policy.
- That SA ECDOH can identify time bound national goals for improving support to PLHIVs and to track changes in the availability and effectiveness of these nutrition services overtime.

- That nutrition assessment should be a vital component of the nutrition care and treatment for PLHIVs in all settings in South Africa.
- That diet history should be used in combination with food frequency assessment to get the actual dietary intake frequency and quality of diets for PLHIVs because usually clients sometimes tell you what you would want to hear not the actual situation.
- That people living with HIV and AIDS's dietary behaviour can be examined by looking at the individual, behavioural and environmental factors , modification of all these three factors will help change dietary behaviour of PLHIVs successfully.
- That facility and individual level nutrition strategies that address overweight are needed to curb the increasing prevalence of overweight and obesity in addition to the underweight strategies currently provided through the supplementation and therapeutic feeding programs in combination with the nutrition counselling.
- That in assessing the nutritional status of PLHIVs it is also important to consider poverty related factors that fuel the dual epidemic of under nutrition and HIV and AIDS such as food security, type and seasonal variations of food.
- That enabling systems be put in place in facilities to promote quality nutrition services.
- That further efforts at a large scale are urgently needed to determine the uptake, quality and effectiveness of nutrition assessment services, their impact on program outcomes such as retention in care and survival of PLHIVs.

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## APPENDICES

### Appendix 1

### Interview Guide

#### STELLENBOSCH UNIVERSITY

#### Nutritional Assessment Interview Guide

**Introduction:** Good morning /afternoon. My name is Merlyn Chapfunga from the University of Stellenbosch conducting a research to determine the effectiveness of nutritional assessment in the treatment and care of people living with HIV/AIDS. If you are comfortable I will ask you a few questions on your nutritional status, dietary intake and common nutritional symptoms. I will also take your weight and height to compare with your usual measurements. The process will take about 30 minutes.

**Name:** \_\_\_\_\_ **Date of Birth:**  
\_\_\_\_/\_\_\_\_/\_\_\_\_

**Gender:** \_\_\_\_\_ **Weight:** \_\_\_\_\_ Kg

**Height:** \_\_\_\_\_ m **BMI** \_\_\_\_\_ kg/m<sup>2</sup>

**Facility:** \_\_\_\_\_

#### Baseline Assessment

1. What is your usual weight \_\_\_\_\_ kg and height \_\_\_\_\_ m?

#### Questions to check on weight loss

2a. Have you recently lost weight? Yes/No If yes when ?

b. Do your clothes still fit properly? Yes/No If no why? And what size clothes are you now putting on?

c. Have you noticed weight gain and body changes in the past 3 months? Yes /No If yes why?

### **Questions to check on nutritional related symptoms**

3a. Has your appetite changed in the past 2 weeks ? **Yes/No** If yes why?

b. What do you like to eat most?

4. Do you have any of the digestion problems:

Difficulty in swallowing? **Yes/No**

Discomfort or pain in the mouth? **Yes /No**

Nausea and vomiting? **Yes/No**

Diarrhoea? **Yes/No**

Bloatness ? **Yes/No**

Constipation? **Yes/No**

If you answered yes in one of the questions above did you use nutrition practices to manage symptoms? **Yes/No**. If yes what nutrition practices?

### **Questions to check on Food access and security**

5a. In the past week have you missed any meals? **Yes/No** If yes how many and what was the reason?

b. Do you or your family members go hungry? **Yes/No** if yes how often?

c. Are you able to eat meat and fish regularly **Yes/No**

d. Are you able to eat fruits and vegetables regularly **Yes/No**

e. What do you do to increase energy intake?

f. How many meals did you consume yesterday?

g. Do you drink treated water regularly? **Yes/No**

**Questions to check on non-prescription medication**

6a. Do you take immune boosters? **Yes/No** .If yes which ones?

b. How often?

c. If you take alcohol how much do you take?

**Questions to check on prescription medication**

7a. Are you taking ARV? **Yes/No** If yes for how long?

b. What medicines other than ARV are you taking?

c. Do you know which of your non ARV drugs /ARV drugs need to be taken with or without food? **Yes/No**. If yes which ones.

**Questions to check on the stage of HIV infection**

8a. Have you been admitted to hospital or diagnosed with TB in the last 3 to 5 years ? **Yes/No**

b. Do you know your most recent CD4 level ?**Yes/No** If yes what is your CD4 count?

C . Have you been counseled in nutrition within the past 1 month? **Yes/No**

**Conclusion**

I have come to the end of my questions, do you have any questions to ask me or anything you need clarity?

If no other questions ,I would like to thank you for taking part in this research. Thank you and good bye.

## Appendix 2

## Consent Form



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jou kennisvenoot • your knowledge partner

### STELLENBOSCH UNIVERSITY AGREEMENT TO TAKE PART IN RESEARCH

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The effectiveness of routine nutritional assessment on the nutritional and health status of people living with HIV and AIDS in centers providing care and support in Lukhanji Sub District of Eastern Cape.

You are asked to participate in a research study conducted by Merlyn T Chapfunga, MPHIL in HIV/AIDS Management *affiliated with the Economic Management department* at Stellenbosch University.

The results will contribute to the write up of MPHIL thesis. You were selected as a possible participant in this study because of being HIV positive and not hospitalized, able to seek medical services from the facility and agree to nutrition screening and assessment you will be able to give correct information to address your needs.

#### 1. PURPOSE OF THE STUDY

The study is designed to determine the effectiveness of nutrition assessment to improve the nutrition status, well-being and quality of life of PLHIVs attending HIV treatment and care at Hewu Hospital in Lukhanji Sub District.

#### 2. PROCEDURES

If you volunteer to participate in this study, we would ask you to do the following things:

- Undergo nutrition assessment that includes assessment of dietary intake and body measurements.
- Provide demographic information.
- Answer questions one after the other to find out on the knowledge of dietary intake, changes in weight, history on gastrointestinal illnesses, signs and symptoms of malnutrition.
- To be followed up for the next two months.
- The process will take about 30 minutes.

### **3. POTENTIAL RISKS AND DISCOMFORTS**

Stigma and fear might likely give problems to some of the participants to continue for the three months and also discomfort (emotional involved) once they discover that they are malnourished. The participants likely to feel discomfort will receive counseling from the nurse. Some of the participants might give false responses thinking that they might get aid through the research. As the participants volunteer to participate it should be made clear to them from the beginning that no aid is involved or attached to the exercise. The form will also be available in Xhosa for the district and the facility nurse will assist in translation of the questions to the participants.

### **4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY**

No direct benefits are attached to the participants but the participants will be able to read the published results. The research will be used to educate others and change of systems and service delivery.

### **PAYMENT FOR PARTICIPATION**

Participants will not receive any payment and this solely a free service.

### **5. CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. The data will be kept in the researcher's laptop only accessible by the researcher and a password will be used. Filled questionnaires will be locked in a drawer only accessible by the researcher. For the purposes of confidentiality pseudo names or numbers will be used. No personal details or particulars will be published and no identity will be attached.

The results will be shared with the study leader for supervision and for those underweight the nurse in charge will be informed to get involved quickly to prevent further weight loss. The results will be shared with the District Manager and Africare management if requested.

Audio tapes will be used, available only by the researcher and will be erased on graduation.

*The results will be published and as a way to maintain privacy false names will be used and no identity will be attached.*

### **6. PARTICIPATION AND WITHDRAWAL**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without costs of any kind. You may also refuse to answer any questions you don't want to answer and still remain in the study. The investigator may remove you from this research if conditions arise which permit doing so. If the participant fails to report for the second visit may result in ending the study .

## 7. IDENTIFICATION OF INVESTIGATORS

If you have any questions or concerns about the research, please feel free to contact [research personnel: Principal Investigator: Merlyn Chapfunga, No 1 Quintette, 2 Riverview Terrace, Beacon Bay, East London, +27726823556 Or +27437212168, merlyn1971@gmail.com. Supervisor: Greg Munro, 0836292567 (South Africa) or +447872416259 (UK) Greg@sybaweb.co.za.

## 8. RIGHTS OF RESEARCH SUBJECTS

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

### SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE

The information above was described to [ name of participant] by *Merlyn Chapfunga* in *English and Xhosa* and [I am/the subject is/the participant is] in command of this language or it was satisfactorily translated to [me/him/her]. [I/the participant/the subject] was given the opportunity to ask questions and these questions were answered to [my/his/her] satisfaction.

[I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study. ] I have been given a copy of this form.

\_\_\_\_\_  
**Name of Subject/Participant**

\_\_\_\_\_  
**Name of Legal Representative (if applicable)**

\_\_\_\_\_  
**Signature of Subject/Participant or Legal Representative**

\_\_\_\_\_  
**Date**

### SIGNATURE OF INVESTIGATOR

I declare that I explained the information given in this document to \_\_\_\_\_ [name of the subject/participant] and/or [his/her] representative \_\_\_\_\_ [name of the representative]. [He/she] was encouraged and given ample time to ask me any questions. This conversation was conducted in [Afrikaans/\*English/\*Xhosa/\*Other] and [no translator was used/this conversation was translated into \_\_\_\_\_ by \_\_\_\_\_].

\_\_\_\_\_  
**Signature of Investigator**

\_\_\_\_\_  
**Date**