NUTRITIONAL STATUS, FOOD SECURITY AND COPING STRATEGIES AMONG PEOPLE LIVING WITH HIV IN DAR ES SALAAM, TANZANIA

By

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CERTIFICATION

The undersigned certifies that has read and hereby recommends for acceptance a dissertation entitled ***Nutritional Status, Food Security and Coping Strategies among People Living with HIV in Dar es Salaam, Tanzania*** in fulfilment of the requirements for the degree of Master of Public Health of the Muhimbili University of Health and Allied Sciences

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I, **Tuzie Edwin,** declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award

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DEDICATION

This work is affectionately dedicated to my beloved parents, Mr. Edwin Ndekia and Mrs. Notburga G. Ndekia who laid the good foundation of my education; and to all who died of and living with HIV and AIDS.

ABSTRACT

HIV and AIDS pandemic progress in the context of severe food insecurity particularly in developing countries. This descriptive cross-sectional study was conducted to assess the nutritional status, food security, and coping strategies among adult people living with HIV and AIDS (PLHA) attending Care and Treatment Centres (CTC) in Dar es Salaam, Tanzania. Data was collected using structured questionnaires with both open and closed questions. A multistage random sampling was used to obtain the CTCs and study subjects. Of the total of 446 PLHA interviewed, 52.2% experienced food insecurity. The prevalence of food insecurity was significantly higher (66.0%) among those without than those with formal education (36.5%) (P<0.001). Those with formal employment had significantly lower prevalence (33.3%) of food insecurity than those with informal employment (57.1%) (P=0.017). Food insecurity was significantly associated with underweight (OR=2.2; 95%CI, 1.4–3.5). The frequency of underweight was significantly lower (12.5%) among those with post-primary education that those without education (35.9%) (P<0.001). The most common coping strategies included borrowing money or food (55.8%) and changing to less preferred foods (53.3%). In conclusion, food insecurity is frequent among PLHA in Dar es Salaam. It is important that strategies to control HIV and AIDS target vulnerable households in order to avoid the negative impact of food insecurity and deaths. HIV control programs should work with communities and other stakeholders to identify ways to alleviate food insecurity through economic empowerment strategies.

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ABBREVIATIONS AND ACRONYMS

AED	Academy for Educational Development
AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
ARV	Antiretroviral
CTC	Care and Treatment Centre
FANTA	Food and Nutrition Technical Assistance Project
FAO	food and Agriculture Organization
HIV	Human Immunodeficiency Virus
IFPRI	International Food and Policy Research Institute
MUHAS	Muhimbili University of Health and Allied Sciences
NACP	National AIDS Control Programme
PEPFAR	President Emergency Plan for AIDS Relief
PLHA	People Living with HIV and AIDS
RCQHC	Regional Centre for Quality Care
TDHS	Tanzania Demographic and Health Survey
TzPPA	Tanzania Participatory Poverty Assessment
UN	United Nations
UNAIDS	United Nations Program on HIV/AIDS
USAID	United States Agency for International Development
WB	World Bank

WFP	World Food Program
WFS	World Food Summit
WHO	World Health Organization

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

The Human immunodeficiency virus (HIV) pandemic has had a devastating effect on health, nutrition, food security and overall socio-economic development. According to UNAIDS/WHO, the estimated number of persons living with HIV worldwide in 2007 was 30.6-36.1 million. Sub-Saharan Africa remains the most seriously affected region with a total of 22.5 million people living with HIV. In the year 2007, the estimated number of deaths due to AIDS was 2.1 million worldwide, of which 76% occurred in sub-Saharan Africa (UNAIDS/WHO, 2007).

Tanzania is among the counties affected greatly by the HIV pandemic. The Tanzania AIDS Indicator Survey (THIS) of 2003/4 reported that HIV prevalence in adult population is 7% and a total of 1.8 million adults and children are estimated to be living with HIV and AIDS by the end of 2003 (TACAIDS, 2004).

The HIV pandemic is occurring within the context of high level of food insecurity, though rarely considered in responding to the pandemic. Food security is defined as a state where all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their food preferences and dietary needs for an active and

healthy life (FAO, 1998). Food security involves three distinct but interrelated aspects including: food availability, food access and food utilization (FAO, 2000).

There are well-established scientific links among poor nutrition, food insecurity, and HIV/AIDS (USAID, 2006). HIV/AIDS and food insecurity are becoming increasingly entwined in a vicious cycle. HIV/AIDS heighten vulnerability to food insecurity and in turn, food insecurity heightens susceptibility to HIV exposure and infection (Gillepsie et al, 2004).

HIV positive individuals normally experience recurrent infections which increase nutritional demand. HIV infection also leads to nutritional deficiencies through decreased food intake, malabsorption and increased utilization and excretion of nutrients, which in turn hasten the onset of AIDS (Semba and Tang, 1999). Malnutrition is thus a major complication of HIV infection and a significant factor in advanced disease. Sufficient quantities of a variety of nutritious foods must be therefore steadily available, accessed and utilized by households as well as people living with HIV and AIDS.

Since the disease commonly strikes the most economically productive members of society, HIV/AIDS is a problem of critical importance for agricultural production, economic and social development. HIV and AIDS often lead to reduced labour for farm production and income generating activities and hence low income. Within the

household, HIV and AIDS lead to low food accessibility, depletion of household's savings and food reserves to pay for health care, compensate for lost labour, and maintain expenditure levels on basic needs and hence food insecurity.

Households mitigate strategies against food insecurity include selling of assets, borrowing money or food and reduction of food intake (FAO, 2001; Maxwell et al., 2002). Consequently, a household with HIV infected persons will amplify the existing baseline food insecurity. This in turn will decrease ability to respond to nutrition and counselling interventions aiming at improving the nutrition of individuals who are HIV positive especially those on antiretroviral (ARV) drugs. AIDS-affected households will take longer to recover from food crises and often may never recover completely (Gillespie et. al, 2005). Thus a household coping with HIV/AIDS, food accessibility is low leading to decreased food consumption. Research in Tanzania showed that per capita food consumption decreased by 15 percent in the poorest households when an adult died (FAO, 2001). Similarly, a study carried out in Uganda showed that food insecurity and malnutrition were foremost among the immediate problems faced by female-headed AIDS-affected households (Topouzis and Hemrich, 1996). In a recent study in southern Africa, Weiser et al, (2007) reported that 32% of women and 22% of men had experienced food insecurity in the preceding 12 months before the survey. In this region, food insecurity was associated with HIV risk behaviour.

Various measures have been taken to address food insecurity among general population and HIV affected people. These include mass mobilization campaigns; short, medium and long-term policies, strategies, plans and programmes to ensure food availability and improved nutritional standards (MoAFS, 2005). However, food insecurity is expected to be worse with advancing disease severity which also coincides with onset of antiretroviral therapy (ART). In some cases poor ARV compliance has been attributed to food insecurity, this is despite adequate nutrition counselling for the HIV and AIDS patients (FANTA, 2004). In Tanzania, there is inadequate information on the extent of food insecurity, nutritional status and mitigation strategies among the HIV and AIDS patients in urban area. This study therefore carried out to assess nutritional status, food security and coping strategies among PLHA attending CTC in Dar es Salaam, as an initial stage in the process to address it.

1.2 Problem Statement

Food insecurity is a global problem especially in developing countries, and the situation is more critical in sub-Saharan Africa. The major determinants of food insecurity include the high level of poverty, which is also an important contributing factor in the transmission of HIV. In developing countries, an estimated two billion people suffer from malnutrition and dietary deficiencies of which about 42% are chronically malnourished (FAO, 1995; UN, 1997; WHO, 1997). According to UNAIDS (2007), sub-Saharan Africa is a home to about 70% of over 30 million people living with HIV

and AIDS globally. A high proportion of households in sub-Saharan Africa are therefore in a constant process to mitigate and cope with hunger or hunger threat in addition to HIV and AIDS. In Tanzania, it is estimated that 58% of the households are having a problem meeting their food needs (TDHS, 2005) and thus their mitigation and coping strategies are seriously threatened by the high burden of HIV and AIDS and hence escalating food insecurity. As a result, the effectiveness of ART interventions are likely to be compromised.

Recently antiretroviral treatment has been made available to PLHA and nutritional counselling has been integrated in their care and support. However, food accessibility is important in improving their nutritional status and ensuring adherence to ART. It has been shown that adequate nutrition plays an important role not only in adherence to ART but also in improving its efficacy (FANTA, 2004). Various food insecurity coping strategies used by PLHA may contribute to poor adherence to antiretroviral regimes. The benefits of nutritional counselling and support will be maximized if there is a regular process to understand the nutritional needs of PLHA, which will include level of food insecurity, coping strategies and their nutritional status.

Food insecure households frequently struggle to meet ordinary basic needs. This may be exacerbated when a member of the household is infected with HIV/AIDS (FANTA, 2004). The increased nutrient demand in PLHA and high frequency of secondary infections gradually drain the individual and household resources to provide both

medical and nutritional care. Food is cited by PLHA as their greatest and most urgent need (USAID, 2006). The call for food may reflect the physical lack of food in the household, but it often echoes lack of means or income to acquire food despite the availability of food in the community or market (FANTA, 2004). Access to and consumption of adequate and appropriate food by households is an important component of food security. Food accessibility depends on the extent to which food can be obtained from household production and/or from the market (MoAFS 2005). Inadequate employment and lack of income among rural and urban poor communities lead to low purchasing power and hence affect access to food.

Increased food insecurity at individual and household levels lead to adoption of coping and mitigation strategies with varying impact on the nutritional status of the individual and the rest of the household members. Some of the coping strategies such as changing eating pattern or habits have negative effects on the well-being of household members, particularly vulnerable groups which include PLHA. Reducing food consumption quantity and quality may be highly erosive coping strategies, as nutrient requirements increase following HIV infection (Gillespie et al., 2005).

Despite the HIV and AIDS negative impacts on the nutritional status and individual/household food security, there is paucity of statistics on the magnitude and coping strategies among PLHA in Tanzania. Such information is crucial for programme planners and policy makers to provide rationale to focus nutritional

interventions as components of HIV prevention, care and treatment programmes. Thus the proposed study aimed at determining the nutritional status, and the level of food insecurity and mitigation strategies in order to recommend strategies that will improve the effectiveness of care as well as the efficiency of support provided to PLHA.

1.3 Rationale of the Study

Limited accessibility to nutritious foods constrains the capacity of many HIV and AIDS-affected households to implement nutritional interventions to strengthen their health. The magnitude and factors affecting food insecurity among PLHA and their households in Tanzania need to be better quantified. It is important that programmes and policy-makers are aware of the extent of food insecurity and mitigation strategies among PLHA or their households in order to make ART programmes more meaningful and successful.

This study was carried out to determine the nutritional status and household food insecurity, as well as exploring the coping strategies among PLHA in Dar es Salaam, Tanzania. It is envisaged that the findings from this study will assist in the designing of appropriate interventions aiming at improving household food security and quality of life of PLHA.

1.4 Objectives

1.4.1 Broad Objective

To assess nutritional status, food security and coping strategies among people living with HIV attending CTC in Dar es Salaam, Tanzania.

1.4.2 Specific Objectives

1. To determine proportion of PLHA who were food insecure and associated factors
2. To determine proportion of PLHA on ARV who were underweight (body mass index (BMI) of less than 18.5)
3. To determine frequency of meals among PLHA who are on ARV
4. To identify and describe type of coping strategies used by PLHA on ARV in response to food insecurity

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Situation of Food Security

The need for food is the topmost important basic need of human being. Thus, achievement of food security is an essential step to overcome poverty in any given country (Oyefara, 2007). Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Mohammed, 2003). The Food and Agricultural Organization (FAO) of the United Nations Report of 2004, estimated that about 852 million people worldwide were undernourished. Out of these, 95.7% were in developing countries and each year, about 18 million people, mostly children, die from starvation, malnutrition and related causes (FAO, 2004).

In Tanzania, about 60% of households in Tanzanian are having a problem in meeting their food needs (TDHS, 2005). The National Food Security Policy estimated that 44 per cent of children under the age of five are malnourished, indicative of chronic food insecurity (MoAFS, 2005).

2.1.1 Availability of Food

Household food availability is attained when enough quantities of food are always available to all household members (Kamugisha, 2002). Such food is obtained through household production, other domestic output, imports and food assistance. In Tanzania the major source of food supply is from local crop and livestock production. On average Tanzania produces about 95% of its food requirements (URT, 2005). The country's food self sufficiency measured by the Self Sufficiency Ratio (SSR) over the period of five years from year 2000/2001 to 2004/2005 is estimated at 96.2 percent.

The major factors affecting food availability are low production and productivity of land, labour and other production inputs, high incidences of crop and livestock pest/vectors and diseases, inadequate processing, storage and marketing infrastructure (MoAFS, 2005). This is caused mainly by inadequate finance to obtain productivity enhancing inputs or capital, limited availability of support services and appropriate technologies. Infectious diseases such as malaria (Mboera et al., 2007) and HIV/AIDS (Rugalema et al., 1999) have also contributed to loss of labour for household agricultural production, since the infected and those caring for them cannot devote enough time and energy for agricultural production. Inappropriate food management at household level do diminishes food stocks available for consumption.

2.1.2 Accessibility to Food

Food access is ensured when households and all individuals within them have adequate resources to obtain appropriate food for nutritious diet (FANTA, 1999). Food accessibility depends on the extent to which food can be obtained from household production and/or from the market. Access is determined by household income availability, income distribution within the household and the food prices (Kamugisha, 2002). Access can also depend on the functioning of the domestic and international markets (MoAFS, 2005). Households secure food in two main ways: food production and food purchase. Both require adequate resources or income (Latham, 1997). Other less common ways of obtaining food are through food gifts or charitable or government food allocations, in free school meals or with food stamps as well as donation from family relatives.

In Tanzania, physical access to food is affected by inadequate infrastructure (transportation networks, storage facilities), affordability, religious and cultural preferences (MoAFS, 2005). An adequate income is necessary to ensure reliable access to food. Since buying food at retail outlets is the most common way that Tanzanian urban populations obtain food, an inadequate income can restrict the quantity and quality of food that individuals or households can purchase.

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2.1.3 Food Utilization

Food utilization refers to the proper biological use of food including quantity that is taken and used by an individual for different body metabolism (Bonnard et al., 2002). Household knowledge of food storage, processing techniques, nutrition, and illness management determine effective food utilization (Kamugisha, 2002). Presence of diseases such as diarrhoea, respiratory disorders, malaria, HIV and AIDS and intestinal parasites tend to impair food intake and nutrients absorption making the food less useful to the body (King and Burgess 1992). Household food utilization is manifested in nutritional status of household members (Kamugisha, 2002). The incidence of malnutrition in a society is an outcome of inadequate consumption and/or utilization of food (MoAFS, 2005).

2.1 HIV/AIDS and Nutritional Status

Biologically, there are multiple relations between HIV/AIDS and nutritional status (Egal and Valstar, 1999). The effect of HIV on nutrition begins early in the course of the disease, even before an individual may be aware that he or she is infected with the virus (FAO, 2002). HIV infection affects nutrition through increases in resting energy expenditure, reductions in food intake, nutrient malabsorption and loss, and complex metabolic alterations that culminate in weight loss and wasting common in AIDS (FANTA, 2004). Good nutrition is important for disease-resistance and may improve the quality of life of AIDS patients (FAO, 2001). According to ACC/SCN (1998), the onset of disease and even death might be delayed in well-nourished HIV-positive individuals

A diet rich in protein, energy and micronutrients, especially vitamin A, facilitate ones resistance to opportunistic infections in AIDS patients (Friis, 1998). Higher nutrients intake is required when patient suffers from secondary disease (Egal and Valstar, 1999). Short-term micronutrient supplementation has been shown to improve body weight and body cell mass (Shabert et al., 1999); to improve CD4 cell counts (Müller et al., 2000) and to reduce the incidence of opportunistic infections (Mocchegiani et al., 2000) among adults with AIDS, including those on antiretroviral treatment.

2.2 Nutrient Requirements for PLHA

Nutrient requirements for PLHA depend on the stage of the disease progression and whether there are opportunistic infections, weight loss or wasting.

2.3.1 Energy requirements

Due to infections and its processes occurring in the body, PLHA experiences high resting metabolic rate, high energy needs and depletion of nutrients, which result in weight loss and wasting. The following are the energy requirements for PLHA as recommended by WHO (2003):

- When there is absence of AIDS symptoms (WHO stage 1), PLHA need to increase their energy intake by 10% above the recommended intake for a healthy non-infected person of the same age, sex and physical activity level.
- When there is presence of symptoms (WHO stage 2 and above), PLHA need to increase the energy intake by 20 to 30% above the recommended levels for a healthy non-infected person of the same age, sex and physical activity level.

These recommended levels are for any HIV-infected person, including those taking any HIV-related medications, ARVs inclusive.

2.3.2 Protein requirements

According to WHO (2003), HIV-infected persons do not need extra protein than the recommended levels for a healthy non-infected person of the same age, sex and physical activity level. However, in areas where protein-energy-malnutrition is highly prevalent such as Tanzania, there is a need to increase protein intakes to meet the recommended levels.

2.3.3 Fat requirements

According to WHO (2003) guidelines, PLHA do not need to increase their fat intake due to their HIV status. However, for those people who are on ARVs as well as those who experience certain infections such as diarrhoea may need to change the quantity of fat intake in some cases (FANTA, 2004).

2.3.4 Micronutrient requirements

It has been observed that in areas where HIV prevalence is high, micronutrient deficiency is common. Micronutrients play a very important role in fighting infection. It is therefore very crucial for an HIV-infected person to consume a diverse diet with foods rich in micronutrients. It is recommended that if the HIV-infected person presents signs

of a specific or multiple micronutrient deficiencies, the deficiency should be addressed using the standard protocols (FANTA, 2004; WHO, 2003).

2.3 HIV/AIDS and Food Security

There is a bidirectional relationship between HIV/AIDS and food security. HIV/AIDS is a determining factor of food insecurity as well as a consequence of food and nutrition insecurity (Oxfarm, 2002). Lack of adequate food and poverty fuel the HIV epidemic, as people are driven to adopt risky strategies in order to survive. Food insecurity and malnutrition raise risks of HIV exposure and infection. The break-up of households due to labour migration in times of food insecurity as well as the exchange of sex for money or food during crises increase vulnerability, with women and children particularly exposed (Oyefara, 2007). In addition, poverty-induced malnutrition is likely to lead to an earlier onset of AIDS, due to an increased susceptibility to opportunistic infections.

HIV/AIDS impacts on food security include short and long-term effects. These include (i) Loss of labour in agriculture and other livelihood activities; (ii) Increased cost of health care and funerals; (iii) Diminished capacity to care for children and other vulnerable individuals; and (iv) Erosion of the asset base.

AIDS also increases longer-term vulnerability through its systemic impact on social and economic systems and institutions in hard hit countries, as it leads to the adoption of irreversible coping strategies (Rugemala et al., 1999). AIDS forces children, particularly girls, to withdraw from school in order to work or care for ill parents. It reduces the inter-generational transfer of skills and knowledge of agriculture and livelihood while it also erodes the human resource base of institutions required to address the sectoral and cross-sectoral impacts of the epidemic (Okuneye, 2002). In other words, HIV/AIDS reduces the availability of labour and knowledge which in turn affect household level access to food

Households headed by children, elderly or single parent, and households with a large number of dependants than they can afford are likely to be most vulnerable to food insecurity. HIV and AIDS have an impact to all of the three aspects of food security. This is because it affects body functions and impairs ability to work hence hindering food security from individual level to national level (RCQHC, 2003). HIV has a more pervasive impact on household food security than other shocks because it increases the nutritional requirement of the individuals, widening gaps between food needs and food access (FANTA, 2007). Within the households, there are other vulnerable groups that require special attention, specifically children, women, disabled, elderly, and people infected or affected with HIV and AIDS (MoAFS 2005).

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The HIV/AIDS pandemic has exacerbated the problem of food insecurity because it profoundly reduces ability to earn income for PLHA therefore impair economic growth of a nation (Phaladze, 2005). The ill person is often unable to work, reducing the income available to the household and/or the output from agricultural activity and any other income generating activities. Economic crisis resulting from the increasing related expenses such as costly medical treatments, extra care, special food and the reduced income as a result of labour loss aggravates food insecurity to family members (Garí, 2002).

Jamison *et al* (2001) reported that, affected households face severe economic constraint because of reduced income and increased health expenditures. Bloom and Mahal (1997) predicted that economic costs of AIDS would be felt not by nations but rather by households where health expenditure by households is four to five times higher than the state expenditure. The authors also report reduced consumption of milk, meat, and eggs as a result of increased health-care expenditures. Gupta (1998) showed that 10 to 30 percent of the annual income of an individual may be spent on the treatment of illness.

2.4 Coping Strategies

Coping strategies are activities, which maintain food security or combat food insecurity that, occur at the household level (Kamugisha, 2002). Coping strategies are used to off-set threats to a household's food and economic resources in times of hardship. When a

sick person is a breadwinner, other household members will be forced to find an alternative source of income for food and other necessary requirements.

Decrease in food availability and access within the household force individuals to seek the alternative way of obtaining food. The first strategy used is that of selling out properties by the family involved (TzPPA, 2002). Secondly, HIV/AIDS cause younger generations to be pulled out of school to boost the family's ability to provide care for the ill and to maintain its current livelihood or develop new livelihoods (IFPRI, 2002). Children may be forced to engage in child labour for attaining money for caring their sick parents or for attaining their daily requirements (IFPRI, 2002). Winrock International (2000) reported other coping strategies such as working hard in the farms to compensate the negative effects, obtaining assistance from relatives and friends, casual employment, selling labour in other people's farms, loan from self-help groups, and wife inheritance. Some studies have even shown that poverty and food insecurity have contributed to many young females joining sex industry (Oyefara, 2007).

Drop in ability to produce, depletion of household income occurs dramatically as more adults are affected. This follow continuous use of the savings, and once the savings are finished, the family seeks food support from relatives, borrows money or sells its productive assets (FAO, 2001). Household first dispose liquid assets held as stores of value before disposing productive assets (Maxwell and Frankenberger, 2002).

Savings and financial assets are usually the first to be depleted after the onset of AIDS. After this, non-productive assets, such as furniture, cooking utensils and clothes follow. Finally, households may have to sell off productive assets such as tools, draught animals, and land (FAO, 2001). Households are thus likely to have less working capital to finance their farming, which also erode their fixed capital (IFPRI, 2002) thus leading to reduced ability to make food available to the households of PLHA.

Ongoing HIV and AIDS interventions especially nutritional counselling and support are focusing among others on improving food utilization among PLHA. Unfortunately because of the linkages between poverty and HIV, such households require efforts to increase the likelihood of success of such interventions. This will require regular understanding of food insecurity and coping strategies at individual and household levels in order to adapt timely, adequate and relevant measures. This study is an attempt to understand the magnitude of food insecurity and coping strategies among HIV and AIDS patients in advanced natural history of the disease using patients attending CTC in Dar es Salaam.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

This was a descriptive cross-sectional study design which used quantitative data collection techniques. The study was conducted in July-August 2008.

3.2 Study Area

The study was conducted in Dar es Salaam City, which has three municipalities namely Ilala, Kinondoni and Temeke. According to 2002 population and housing census, the City's population was estimated at 2.9 million (URT, 2003). Administratively, the City has three municipalities, 11 divisions, 73 wards and 276 streets. (Dar es salaam City Council, 2007). Its rate of increasing is very high due to immigrants looking for economic opportunities and thus creating conducive context of HIV transmission and thus high number of infected individuals. The HIV prevalence in the City is estimated at 11% making it second leading region in the country (THIS, 2005).

Among the national response to the HIV and AIDS pandemic was the setting up of Care and Treatment Centres (CTC) of which there are 28 CTC in Dar es Salaam. Dar es Salaam was chosen purposeful, as it was the region with highest number of CTC in Tanzania, located mainly in the Government health facilities.

3.3 Target Population

The study targeted adults aged 18 years and above who were infected with HIV and were attending Care and Treatment Centres (CTC) in Dar es Salaam. Thus those eligible were those who were on ARV, and attending CTC for either their first, second or third appointments.

3.4 Sample Size and Sample Selection

3.4.1 Sample Size

The minimum sample size was calculated using the following formula:

$$n = \frac{z^2 p (1 - p)}{\varepsilon^2}$$

Where,

n = the required minimum sample size

$z = (1.96)^2$ Confidence interval 95%

ε = marginal error = 5%

p = 50 % (since the proportion of PLHA attending CTC who were food insecure was not known, it was therefore estimated at 50%)

$$n = \frac{1.96^2 \times 50 \times (100 - 50)}{5^2} = 385$$

Adjust for none response, n = 385/90% = 428

balance. Height was measured when the subjects in an upright posture stood before the stadiometre (model Leicester Height Measure™) without shoes and with their shoulders, buttocks and heels touching the trunk. The height was read off the measuring stick of the stadiometre and recorded in centimetres. Body weight was measured when the subjects were asked to step on an electronic scale (model 770: SECA™ Hamburg, Germany) barefooted and wearing light clothes. The body weights were then read and recorded to the nearest 0.1 kilogram. However, to adjust for weight of clothes, 0.5kg was subtracted from the reading.

Data obtained were used for determining Body Mass Index (BMI) of respondents i.e body weight (kg)/height $(m)^2$. BMI was used to asses the nutritional status of the study patients. BMI was classified according to WHO standards, i.e. BMI less than 18.5 as underweight, 18.5 to 24.9 as normal weight, 25 to 29.9 as overweight, and 30 plus as obese.

3.5.2 Food Security Measurement

Food security status was measured using three questions which were (1) are you worried that food would run out, (2) has food that you bought didn't not last and did not have money to buy more, and (3) do you cut the size of meals or skipped meals because there is not enough food or money for food. Food insecurity was defined as having any two among the three above indicators.

3.4.2 Sample Selection

Multistage sampling was used, the first stage involved random selection of six CTC, i.e two from each Municipality. The second stage involved random selection of patients in each CTC. On each working day, each patient in a CTC was assessed for eligibility. Every fifth eligible patients on ARV was included in the study until 5 patients were recruited for that day.

3.5 Data Collection

Quantitative data were collected through a structured questionnaire with both open and closed questions. The questionnaire was prepared in English and translated to Kiswahili and back to English. Consistency was established and the Kiswahili version was used for interviews. The questionnaire sought information on the following: demographic indices (age, sex, education, occupation, marital status), head of household, household size, income, means of accessing food, frequency of meals and frequency of consuming certain food groups. Information on how individuals coped with inadequate finance and or food was also sought. All questionnaires filled by the research assistants were simultaneous checked for completion, consistency and any error.

3.5.1 Nutritional Status Assessment

Simple anthropometric measurements of height and weight, were taken for assessment of nutritional status. Height was taken using stadiometre stand and weight using electronic

3.6 Study Variables

(a) Independent variables: Included age, sex, marital status, occupation, income of respondents

(b) Dependent variables: Food insecurity, coping strategies and nutritional status

3.7 Recruitment and Training of Research Assistants

The principal researcher collected the data with assistance of five research assistants. The research assistants were recruited from the study area with experience in human nutrition and data collection. The assistants were trained for one day before the commencement of the survey. The training content included briefing on the study objective, familiarization with research tools and how to administer tools as well as conducting the whole exercise. During the training, research assistants were introduced to research ethics, confidentiality and informed about field logistics. Research assistants were supervised when in the field. There were meetings at the end of each survey day.

3.8 Pre-testing of the Questionnaire

The pilot testing of the questionnaire was carried out at a selected Care and Treatment Centre, which was not among those selected for the actual study. The pre-testing exercise aimed at checking the clarity of questions, ability to generate the desired data

and whether there were any important aspects missing. Following the pre-testing exercise the questionnaire were revised and changes incorporated accordingly.

3.9 Administration of Questionnaires

The questionnaires were administered in a room with enough privacy at the CTC. Each interviewee was asked to give a written consent. Those who gave consent were interviewed. The purpose of the study was explained to each eligible individual attending the CTC. Issues of confidentiality and anonymity were also explained to consenting eligible individuals as were assured. At the end of the each interview, raised questions related to food and nutrition by interviewees were referred to the CTC providers.

3.10 Data Analysis Procedures

Quantitative information collected with questionnaires was coded, classified and tabulated to adjust for any missing information and correcting for outliers. STATA Version 8 statistical software was used to enter and analyse quantitative data. Frequencies of dependent variables were calculated. This was followed by cross-tabulation of quantitative variables. Statistical significance of association was set at 95% CI, and for all statistical tests $P \leq 0.05$ was considered significant. Crude and Adjusted Odds Ratio were calculated.

3.11 Ethical Considerations

Ethical clearance for conducting the research was sought and obtained from the Research Ethics Committee of the Muhimbili University of Health and Allied Sciences.

Before carrying out the study permission was obtained from the relevant authorities. A letter of introduction from the Director of Research and Publication was presented to the City Authority, Municipal Authority and Municipal Medical Officers of Health. These introduced the researcher and the assistants to the In-charges of the selected CTC. At the CTC the study objective was explained to the staff.

Respondents were informed that participation in the study was voluntary and that they were free to decline or withdraw their participation at any time in the course of the study. In order to ensure confidentiality, the names of the participants were not written in the questionnaires. The information which was obtained from the respondents was strictly used for the study purpose and was treated with confidentiality.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic Characteristics

A total of 446 people living with HIV attending CTC in the three Municipalities of Dar es Salaam were interviewed. Of these, 153 (34.3%) were from Ilala, 150 (33.6%) Temeke and 143 (32.1%) Kinondoni (Table 1). A large proportion (67.9%) of respondents was females. About three quarters (73.1%) of the respondents were aged between 25 to 44 years while only 23 (5%) were below 25 years. Two thirds (67%) were Moslems while less than half (43.9%) were married, 18.6% were single and fewer (5.8%) were co-habiting.

About two thirds (66.7%) of the respondents had primary school education while 12% had no formal education. Just more than half (58.5%) of respondents were heads of household. Likewise more than half (58.5%) of the respondents were engaged in informal employment while 10.8% had formal employment.

The majority (70%) of respondents had regular income of whom close to two-thirds (63.7%) had a monthly income of less than Tanzanian Shillings 60,000.00 and 16.8% had a monthly income of above Tanzanian Shillings 100,000.00 (Table 1).

Table 1: Socio-demographic characteristics of respondents

	Municipality			
	Ilala n (%)	**Kinondoni** n (%)	**Temeke** n (%)	**Total** n (%)
Sex				
Female	110(71.9)	91(63.6)	102(68.0)	303(67.9)
Male	43(28.1)	52(36.4)	48(32.0)	143(32.1)
Age				
< 25	8(5.2)	8(5.6)	7(4.7)	23(5.2)
25 – 34	66(43.1)	49(34.3)	62(41.3)	177(39.7)
35 – 44	59(38.6)	54(37.8)	36(24.0)	149(33.4)
45+	20(13.1)	32(22.4)	45(30.0)	97(21.8)
Religion				
Christians	62(40.5)	66(46.2)	43(28.7)	171(38.3)
Moslems	91(59.5)	77(53.9)	107(71.3)	275(61.7)
Marital Status				
Single	24(15.7)	33(23.1)	26(17.33)	83(18.6)
Married	73(47.7)	51(35.7)	72(48.00)	196(44.0)
Widowed	17(11.1)	21(14.7)	29(19.33)	67(15.0)
Separated/Divorced	28(18.1)	27(18.9)	19(12.67)	74(16.6)
Cohabiting	11(7.2)	11(7.7)	4(2.67)	26(5.8)
Education Status				
No formal education	18 (11.8)	14(9.8)	21(14.0)	53(11.9)
Primary	98(64.1)	89(62.2)	110(73.3)	297(66.6)
Post Primary	37(24.2)	40(28.0)	19(12.7)	96(21.5)
Occupation				
Peasant	19(12.4)	12 (8.4)	13(8.7)	44(9.9)
Formal employment	12(7.8)	28 (19.58)	8(5.3)	48(10.8)
Informal employment	88(57.5)	76 (53.15)	96(64.0)	261(58.5)
Others	34(22.2)	27 (18.88)	32(21.3)	93(20.9)
Income				
No	60(39.2)	39(27.3)	35(23.3)	134(30.0)
< 60,000	56(36.6)	36(25.2)	58(38.7)	150(33.6)
60,000 – 99,000	24(15.7)	30(21.0)	33(22.0)	87(19.5)
100,000 – 199,000	7(4.6)	21(14.7)	10(6.7)	38(8.5)
200,000+	6(3.9)	17(11.9)	14(9.3)	37(8.3)
Total	**153 (34.3)**	**143 (32.1)**	**150(36.6)**	**446(100.0)**

The study also inquired about ownership of households' assets of whom 77.8% owned radio and 78.7% telephone sets. Majority (80%) were living in houses with a cement floor, walls made of cement bricks (82%), and iron sheets roof (85.7%).

4.2 Food Accessibility

The major source of food for the most (98.7%) of the respondents was through purchase. However, about one fifth, reported to access additional food through assistance from relatives, friends and various organizations. More than half (58.8%) were borrowing money or food from others, while 30% were receiving assistance from friends and relatives. Likewise, about 17% were involved in casual employment while 15% were selling households assets. The reasons provided for reduced ability to access food included low ability of household to earn income (29.7%), depletion of household income (70.9%) and increased cost for care and treatment (34.6%).

4.3 Household Food Security

More than half (52.2%) of the respondents were found be food insecure (Table 2). Food insecurity was slightly more prevalent among males (54.6%) than females (51.2%).

Although food insecurity increased with age from 43.5% among less than 25 years olds to 58.8% among those 45 years or older; the difference was not statistically significant

(P = 0.273). Food insecurity was least (48.2%) among those who were single and highest (57.7%) among those cohabiting.

Table 2: Household food security status and selected characteristics

Variable	Food Security Status		
	Insecure n (%)	Secure n (%)	P-value
Sex			
Female	155 (51.2)	148 (48.8)	0.503
Male	78 (54.6)	65 (45.5)	
Age			
< 25	10 (43.5)	13 (56.5)	0.273
25 – 34	85(48.0)	92(52.0)	
35 – 44	81(54.4)	68(45.6)	
45+	57(58.8)	40(41.3)	
Marital Status			
Single	40(48.2)	43(51.8)	0.870
Married	101(51.5)	95(48.5)	
Widowed	36(53.7)	31(46.3)	
Separated/Divorced	41(55.4)	33(44.6)	
Cohabiting	15(57.7)	11(42.3)	
Education Status			
No formal education	35 (66.0)	18 (34.0)	<0.001
Primary	163 (54.9)	134 (45.1)	
Post Primary	35(36.5)	61(63.5)	
Occupation			
Peasant	20(45.5)	24(54.6)	0.017
Formal Employment	16(33.3)	32(66.7)	
Informal Employment	149(57.1)	112(42.9)	
Others	48(51.6)	45(48.4)	
Income			
No	73(54.5)	61(45.5)	< 0.001
< 60,000	94(62.7)	56(37.3)	
60,000 – 99,000	45(51.7)	42(48.3)	
100,000 – 199,000	16(42.1)	22(57.9)	
200,000+	5(13.5)	32(86.5)	

The prevalence of food insecurity was significantly higher (66.0%) among those without than among those primary or higher education declined with education (36.5%). Food insecurity was less likely among those whose education was higher than primary school (OR=0.3; 95%CI, 0.14–0.62); the significance remained after controlling for sex and age (OR=0.27; 95%CI, 0.09–0.82). Those with formal employment had significantly low prevalence (33.3%) of food insecurity than those with non-formal employment (57.1%); (P = 0.017) (Table 3). Individuals whose income was more than Tanzanian Shillings 200,000.00 were significantly less likely to report food insecurity (OR=0.13; 95%CI, 0.04–0.38); even after controlling for age and sex, it remained significant (OR=0.10; 95%CI, 0.01–0.67).

Table 3: Food insecurity adjusted for age and sex

Variable	Crude		Adjusted*	
	OR	95% CI	OR	95% CI
Sex				
Female	1.00		1.00	
Male	1.15	0.77 - 1.71	0.95	0.60 - 1.50
Age				
<25	1.00		1.00	
25-34	1.20	0.50 - 2.89	1.14	0.47 - 2.79
35-44	1.55	0.64 - 3.77	1.74	0.70 - 4.32
45+	1.85	0.73 - 4.69	1.52	0.55 - 4.18
Education level				
No education	1.00		1.00	
Primary	0.63	0.34 - 1.16	0.45	0.20 - 1.00
Post-primary	0.30	0.14 - 0.62	0.27	0.09 - 0.82
Occupation				
Peasant	1.00		1.00	
Formal	0.60	0.26 - 1.41	0.40	0.10 - 1.60
Informal	1.60	0.84 - 3.04	1.35	0.62 - 2.95
Others	1.28	0.62 - 2.64	1.70	0.66 - 4.41
Income				
No	1.00		1.00	
<60,000	1.40	0.87 - 2.26	1.17	0.68 - 2.00
60,000 – 100,000	0.90	0.52 - 1.54	0.67	0.32 - 1.44
100,000-200,000	0.61	0.29 - 1.27	0.31	0.08 - 1.28
200,000+	0.13	0.04 - 0.38	0.10	0.01 - 0.67
Marital status				
Single	1.00		1.00	
Married	1.14	0.68 - 1.91	0.99	0.56 - 1.74
Widowed	1.25	0.65 - 2.39	1.80	0.66 - 4.91
Separated/Divorced	1.34	0.71 - 2.51	1.23	0.42 - 3.57
Cohabiting	1.47	0.60 - 3.59	1.16	0.33 - 4.07
Meal frequency				
3 +	1.00		1.00	
< 3	4.16	2.05 - 8.43	4.07	1.69 - 9.82
BMI				
Not Underweight	1.00		1.00	
Underweight	2.19	1.36 - 3.53	1.96	1.15 - 3.36

*Adjusted for age and sex

Reporting of food insecurity was also significantly associated with underweight (OR = 2.2; 95%CI, 1.4–3.5); even when controlling for sex and age (OR = 2.0; 95%CI, 1.2–3.4). Among those who were food secure, a significant higher proportion (94.8%) reported higher frequency of taking meals compared to those who were food insecure (81.6%); (P = 0.001).

4.4 Frequency of Meals Consumption

The majority (88%) of the respondents took three or more meals per day while the remaining took only two or less meals per day (Table 4). Among females, a slightly higher proportion (12.2%) took less than two meals a day compared to 11.9% among males, difference was not statistically significant (P = 0.922).

Low frequency of meals was significantly more prevalent (18.6%) among those 45 years or older than those aged 35 – 44 years old (P = 0.04). Significantly, a lager proportion (20.8%) of those without formal education was taking two or less meals per day than those with formal education (P < 0.001). Only 39.2%, were taking snacks, two or more times in a day while 109 (24.4%) reported not to be taking snacks.

Table 4: Comparison of meal consumption and selected characteristics

Variable	No. meals per day		P Value
	2 or less n (%)	3 or more n (%)	
Sex			
Female	37 (12.2)	266 (87.8)	P = 0.922
Male	17 (11.9)	126 (88.1)	
Age			
< 25	2(8.7)	21(91.3)	P = 0.037
25 – 34	24(13.6)	153(86.44	
35 – 44	10(6.7)	139(93.3)	
45+	18(18.6)	79(81.4)	
Marital Status			
Single	5(6.0)	78(94.0)	P = 0.347
Married	24(12.2)	172(87.8)	
Widowed	11(16.4)	56(83.6)	
Separated/Divorced	10(13.5)	64(86.5)	
Cohabiting	4(15.4)	22(84.6)	
Education Status			
No formal education	11(20.8)	42(79.3)	P < 0.001
Primary	42(14.1)	255(85.9)	
Post Primary	1(1.0)	95(99.0)	
Occupation			
Peasant	8(18.2)	36(81.8)	P = 0.196
Formal Employment	2(4.2)	46(95.8)	
Informal Employment	31(11.9)	230(88.1)	
Others	13(14.0)	80(86.0)	
Income			
No	22(16.4)	112(83.6)	P = 0.007
< 60,000	24(16.0)	126(84.0)	
60,000 – 99,000	7(8.1)	80(92.0)	
100,000 – 199,000	0(0.0)	38(100.0)	
200,000+	1(2.7)	36(97.3)	
Food security status			
Secure	11(5.2)	202 (94.8)	P < 0.001
Insecure	43 (18.5)	190 (81.6)	

4.5 Nutritional Status

Less than a quarter (21.8%) were underweight as their BMI was less than 18.5 (Table 5). Prevalence of underweight among females was slightly lower (21.5%) than among males (22.4%); however, the difference was not statistically significant (P = 0.825). Those in the age group of 35 – 44 years had least (18.8%) proportion of underweight compared to those less than 25 years (34.8%).

Although underweight was least (15.4%) among those cohabiting and highest (25.7%) among those separated; the difference was not statistically significant (P = 0.795). Prevalence of underweight was significantly higher (35.9%) among those without formal education than among those with Post-Primary education (12.5%); (P < 0.001). Similarly those who were food secure had least prevalence (15.0%) of underweight compared to those who were food insecure (27.9%).

When adjusting for sex and age, those with formal employment were slightly more likely to be underweight as compared to peasants (OR=1.25; 95%CI, 0.5–3.3); however, the difference was not statistically significant (Table 6).

Table 5: Comparison of Body Mass Index and selected characteristics

Variable	Body Mass Index		
	< 18.5 n (%)	**≥ 18.5** N (%)	**P-value**
Sex			
Female	65(21.5)	238(78.6)	
Male	32(22.4)	111(77.6)	0.825
Age			
< 25	8(34.8)	15(65.2)	
25 – 34	34(19.2)	143(80.8)	
35 – 44	28(18.8)	121(81.2)	0.119
45+	27(27.8)	70(72.2)	
Marital Status			
Single	18(21.7)	65(78.3)	
Married	40(20.4)	156(79.6)	
Widowed	16(23.9)	51(76.1)	
Separated/Divorced	19(25.7)	55(74.3)	
Cohabiting	4(15.4)	22(84.6)	0.795
Education Status			
No formal education	19(35.9)	34(64.2)	
Primary	66(22.2)	231(77.8)	
Post Primary	12(12.5)	84(87.5)	
Occupation			0.004
Peasant	12(27.3)	32(72.7)	
Formal Employment	7(14.6)	41(85.4)	
Informal Employment	56(21.5)	205(78.5)	
Others	22(23.7)	71(76.3)	
Income			0.485
No	34(25.37)	100(74.63)	
< 60,000	44(29.33)	106(70.67)	0.002
60,000 – 99,000	11(12.64)	76(87.36)	
100,000 – 199,000	6(15.79)	32(84.21)	
200,000+	2 (5.41)	35(94.59)	
Food Security Status			
Secure	32(15.02)	181(84.98)	>0.001
Insecure	65(27.90)	168(72.10)	

Table 6: Crude and Adjusted Odds Ratios (OR) of Underweight

Variable	Crude		Adjusted*	
	OR	95% CI	OR	95% CI
Sex				
Female	1.00		1.00	
Male	1.06	0.65 - 1.71	1.09	0.60 - 1.98
Age				
<25	1.00		1.00	
25-34	0.45	0.17 - 1.15	0.47	0.19 – 1.20
35-44	0.43	0.17 - 1.14	0.38	0.14 – 1.04
45+	0.72	0.27 - 1.91	0.70	0. 25 – 1.98
Education level				
No education	1.00		1.00	
Primary	0.51	0.27 - 0.96	0.56	0.25 - 1.24
Post-primary	0.26	0.11 - 0.60	0.45	0.12 -1.76
Occupation				
Peasant	1.00		1.00	
Formal	0.46	0.16 - 1.31	0.70	0.11 - 4.41
Informal	0.73	0.35 - 1.51	1.25	0.47 - 3.29
Others	0.83	0.36 - 1.88	1.09	0.34 - 3.50
Income				
No	1		1	
<60000	1.22	0.72 - 2.07	1.00	0.53 - 1.89
60 – 100000	0.43	0.20 - 0.90	0.31	0.08 - 1.12
100,000-200000	0.55	0.21 - 1.44	0.80	0.19 - 3.34
200000+	0.17	0.04 - 0.76	0.18	0.01 - 2.27
Marital status				
Single	1.00		1.00	
Married	0.93	0.49 - 1.74	1.05	0.51 - 2.17
Widowed	1.13	0.52 - 2.45	1.81	0.39 - 8.40
Separated/Divorced	1.25	0.59 - 2.62	2.17	0.72 - 6.52
Cohabiting	0.66	0.20 - 2.17	1.04	0.17 - 6.55
Food security				
Secure	1.00		1.00	
Insecure	2.19	1.36 - 3.53	1.96	1.15 - 3.36
Meal frequency				
3 +	1.00		1.00	
< 3	3.50	1.90 – 6.42	2.50	1.33 - 4.67

* Adjusted for age and sex

Those reporting food insecurity were more than twice likely to be underweight as compared with those who were food secure (OR=2.2; 95%CI, 1.4–3.5). After controlling for sex and age it remained statistically significant (OR=2.0; 95%CI, 1.2–3.4). Higher BMI was a function of high frequency of meals intake. Those who took less than three meals a day were likely to be underweight (OR=3.5; 95%CI, 1.9–6.4). After controlling for sex and age the association remained statistically significant (OR=2.5; 95%CI, 1.3–4.7).

4.6 Coping Strategies

Coping strategies among respondents who were food insecure were explored. More than half (55.8%), reported that they were borrowing food or money (Table 7). Other strategies included changing to less preferred foods (53.3%), limiting food portion size (43.0%), skipping meals (41.2%) and practicing maternal buffering (10.9%). Others including selling of household assets and sending children to work (1.8%).

Table 7: Coping mechanisms in response to household food insecurity

Coping strategy	N=165	
	N	%
Eating less preferred foods	88	53.33
Limiting food portion size served to household members	71	43.03
Skipping meals by household members	68	41.21
Borrowing food or money	92	55.76
Maternal buffering	18	10.91
Others	3	1.82

CHAPTER FIVE

5.0 DISCUSSION

Slightly over half of the PLHA in Dar es Salaam experience food insecurity. Poverty and food insecurity are among the most pressing social issues in Tanzania. Available statistics indicate that 58% of the households in Tanzania are considered food insecure (TDHS, 2005). This implies that the general population is experiencing food insecurity even in the absence of HIV and AIDS epidemic and that the disease further exacerbates the food situation in the household. With the prevailing food insufficient among the respondents, it was not surprising to find that only a moderate proportion of the households were taking less than three meals per day, and one fifth were underweight. Levels of education and income of the respondent were important factors influencing food insufficient among the households in Dar es Salaam.

The findings of this study show significant relationship between underweight, food insecurity and frequency of meal consumption. The high proportion of underweight among PLHA in Dar es Salaam is likely to be associated with consumption of fewer meals per day or increased nutrient demands due to HIV and associated complications. Changes in metabolism occurring due to HIV infection, cause the need for increased amount of food intake and hence increased number of meals per day (Piwoz and Preble, 2000). Due to increased nutrient requirements, it is recommended that PLHA consume three meals with snack each day (TFNC, 2003; Kinabo et al., 2004). Despite such

CHAPTER FIVE

5.0 DISCUSSION

Slightly over half of the PLHA in Dar es Salaam experience food insecurity. Poverty and food insecurity are among the most pressing social issues in Tanzania. Available statistics indicate that 58% of the households in Tanzania are considered food insecure (TDHS, 2005). This implies that the general population is experiencing food insecurity even in the absence of HIV and AIDS epidemic and that the disease further exacerbates the food situation in the household. With the prevailing food insufficient among the respondents, it was not surprising to find that only a moderate proportion of the households were taking less than three meals per day, and one fifth were underweight. Levels of education and income of the respondent were important factors influencing food insufficient among the households in Dar es Salaam.

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recommendations, a reasonable proportion of the respondents reported consuming less than standard number of meals per day thus suggesting that the high levels of underweight is due to both fewer number of meals and disease process.

The findings of this study suggest that food insecurity is an important determinant of underweight. However, other significant determinants of food insecurity were low education, low income and low feeding frequency. Failure to achieve increased food intake will result in muscle wasting and worsening condition of the body (Piwoz and Preble, 2000). Thus because of low education and hence low income, PLHA are unable to afford the right quantity and quality of food leading to food insecurity. Several studies have already demonstrated links between HIV/AIDS and household food insecurity (UNAIDS, 2003; Gillespie et al., 2004). Like in this study, a survey conducted in urban areas of Malawi has shown that HIV/AIDS affects food security through its negative effects on human, financial and social capital (Palamuleni et al., 2003).

The majority of the respondents in this study were accessing food through purchase. It is likely that the reduced ability to earn income and increased costs of care and treatment resulted into inadequate access to food and hence food insecurity. Low capacity to purchase food was also reported by a high proportion of respondents who had a monthly income less than TSh 60,000.00. Anything that reduces the ability to work and produce or earn an income is likely to result in reduction in ability to purchase food and other necessities and hence low chances of meeting daily food requirements. It has been

reported that inability to meet the food requirement of the household through either production or purchase is common among urban poor, the rural landless and the resources poor smallholder farmers and pastoralists (MoAFS, 2005).

The relationship of food insecurity and low income found in this study is also supported by findings of studies elsewhere that illnesses due to HIV/AIDS cause body weakness and therefore making an individual unable to work (Gari, 2002). Studies in India have also shown that affected households face severe constraints due to poor health that lead to reduced income and increased health expenditure (Bloom and Mahal, 1996; Basu et al., 1997; Gupta, 1998). In Malawi, Shah et al. (2001) found that 70% of the households affected by chronic sickness suffered from labour shortage. Other studies in Tanzania, Cote d'Ivoire and South Africa have indicated that HIV/AIDS afflicted households do tend to incur high medical care expenditures (Tibaijuka, 1997; Bechu, 1998; Booysen and Bachmann, 2002). This indicates that HIV/AIDS is a serious threat to the nation's economy and household's wellbeing where people have to spend most of their income on health care. It is important that strategies to control HIV/AIDS target vulnerable households early in order to avoid the negative impacts such as food insecurity and malnutrition.

The prevalence of food insecurity was slightly higher among males (54.6%) than females (51.2%). Similar findings have been reported by studies on food security elsewhere that households led or headed by women, despite more limited economic

resources, are better than one would expect. Households led by women have several ways of closing the gap between their incomes by often engaging in the informal sector or social networks which enable them to support their household better (Lemke, 2003). However, a number of studies have also shown that further investigations are required to establish why some households are more successful than others, though with limited access to economic resources.

A larger proportion of PLHA in this study reported getting assistance from relatives, friends or relief organizations. However, these are considered to be unreliable sources of food (Bonnard, 2003), as such assistance are likely to be not adequate enough to mitigate the situation. More importantly, there was no evidence that the food assistance was targeting the most vulnerable groups which included those with low education, poor income or food insecure.

The dietary strategies observed in this study included eating less preferred foods, reducing portion sizes served to household members, reducing the number of meals taken per day, maternal buffering and eating at neighbour's house. Non-dietary strategies included selling of critical assets and borrowing money or food. Like elsewhere, due to food insecurity, there were changes in food consumption behaviour in terms of quantity and quality (van Liere, 2002). Most of the identified various dietary and non-dietary coping strategies used by households during food shortages have negative repercussions on nutritional status of the PLHA and the rest of the household

members (Kraak et al., 1999). According to Gillespie et al. (2005), reducing food consumption quantity and quality may be a highly erosive coping strategy, as nutrient requirements rise following HIV infection. Although some strategies are easy to recover, others are relatively difficult and may exacerbate poverty, food insecurity and malnutrition (Maxwell and Frankenberger, 2002).

Study Limitation

The study subjects were those attending CTC, which is likely not a representative of the general population of PLHA. Moreover, there are possibilities that the responses of the study subjects were biased. The responses as regards to reduced income and ability to access food as well eating frequency might have been prompted by the expectations of receiving food support from the researchers. However, this limitation was overcome by explaining the objective of the study to the subjects.

This was cross-sectional study, it was therefore, difficult to determine whether food insecurity was seasonal or not. Moreover, the individual responses may not reflect the real situation at the household level as visits were not made to the respective households. A longitudinal community-based study is recommended for future research and the tools used to measure food security need to be validated to cover for both urban and rural settings.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study found out that food insecurity was a significant problem among PLHA attending CTC in Dar es Salaam. Food insecurity was significantly associated with low education and income leading to consumption of fewer meals a day and underweight. Moreover inadequate or lack of income leads to low purchasing power and hence affect access to food despite the availability of food in the community or markets. Inadequate access to food leads to reduced food consumption in terms of quantity and quality which in turn lead to underweight and malnutrition. Access to adequate food, frequency of meals and nutritional status can be used as basis in identifying PLHA who are food insecure.

Addressing food security issues will increase ability of PLHA to respond to nutrition and counselling interventions aiming at improving their nutrition status. Moreover, this will maximize the effectiveness of ART and nutrition interventions which in turn will lead to good adherence and efficacy of ARV. Findings of this study provide some rationale to consider adequate food as a central component in HIV Care and Treatment programmes.

National policies in responding to the pandemic should therefore include encouraging Government and Non-Government Organizations to target food assistance to the most vulnerable groups. In order to minimise the negative effects of HIV and AIDS on food security, control programme should focus the most vulnerable groups which include those with low education and/or low income.

6.2 Recommendations

In order to improve food security among PLHA, the following recommendations are made based on the findings of this study:

- Given that malnutrition adversely affects medication efficacy, ART program implementers should work with communities and other stakeholders to identify ways for food insecure PLHA to access the sufficient quantity and quality of food needed.
- There is a need for well-designed targeted food aid programmes for PLHA who are underweight and food insecure. Combining food aid with income-generating activities should be a way of helping households to deal with their reduced access to food and build self sufficiency.
- There is need for longitudinal studies on food security issues and coping strategies among PLHA on ARV in both rural and urban to evaluate best strategies to target those vulnerable.

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APPENDICES

Appendix 1: QUESTIONNAIRE (English Version)

A: IDENTIFICATION

Date of Interview ____ / ____ /2008 **Questionnaire No:** .....

Name of interviewer .....

Name of CTC .....

(1) Amana (2) Buguruni (3) Mwanayamala

(4) Sinza (5) Temeke (6) Mbagala Rangitatu

Municipality.....

(1) Ilala (2) Kinondoni (3) Temeke

B: BACKGROUND DATA

Q1. Date of birth (state actual age (years)) .....

Q2. Sex .....

(1) Female (2) Male

Q3. Religion: .....

(1) Christian (2) Moslem (3) Others (specify) .....

Q4. Marital Status .....

(1) Single (2) Married (3) Widowed

(4) Separated (5) Divorced (6) Co-habiting

Q5. Highest level of education .....

(1) Informal (2) Primary (3) Secondary

(4) Vocational Training (5) College/University

Q6. What is your occupation .....

(1) Student (2) Peasant (3) Formal employment

(4) Informal employment (5) Businessman/woman (6) Other (specify)...

Q7. What relation do you have with the head of household?

(1) Head of household (Go to Qn 12)

(2) Wife/husband (3) Child (4) Relative

(5) Other (specify) .....

Q8. Sex of the head of the household .....

(1) Female (2) Male

Q9. What is the marital status of the head of your household?

(1) Single (2) Married (3) Widowed

(4) Separated (5) Divorce (6) Co-habiting

Q10. What is highest level of education of head of household?

(1) Informal (2) Primary (3) Secondary

(4) Vocational Training (5) College/University (6) Don't know

Q11. What is the occupation of the head of your household?

(1) Student (2) Peasant (3) Formal employment

(4) Informal employment (5) Businessman/women (6) Others (specify)...

Q12. Do you have any income?

(1) Yes (2) No (Go to Qn. 14)

Q13. What is your average income per month .....

(1) < 60,000 (2) 60,000-99,000 (3) 100,000 – 199,000

(4) 200,000 – 299,000 (5) 300,000 – 499,000 (6) > 500,000

Q14. Does your household or any member posses any of the following (tick all that apply)

(1) Radio (2) Television (3) Telephone/Mobile (4) Refrigerator

(5) Bicycle (6) Motorcycle (7) Car/Truck (8) House

(9) Farm (10)Livestock (cattle,goats, pigs,poultry)

Q15. Does your house has the following (tick all that apply)

(1) Electricity (2) Earth/sand floor (3) Cement floor

(4) Tiles floor (5) Bricks walls (6) Mud walls

(7) Stones walls (8) Iron sheets walls (9) Grass roof

(10)Concrete roof (11)Iron sheets roof

Q16. How many are you in your household? .....

(1) Under five years .....

(2) 6 – 17 years .....

(3) 18 and above .....

C: STIGMATIZATION

Q17. How long since you knew you were HIV positive? (Date tested for HIV) .....

Q18. Why did you test for HIV?

(1) Spouse did it/proposed (2) Illness (3) VCT campaign

(4) Employment reasons (5) Marriage requirements

(2) Others (Specify) .....

Q19. How many times have you tested for HIV?

(1) Once (2) Twice (4) Thrice (4) More than thrice

Q20. Where did you take an HIV test?

	Facility/Site	**District**	**Region**
1st Test			
2nd Test			
3rd Test			
4th Test			

Q21. Have you disclosed your HIV status?

(1) Yes (2) No

Q22. If Yes, to whom did you first disclose? (tick all that apply)

(1) Spouse/Partner (2) Children (3) Sister

(4) Brother (5) Mother (6) Father

(1) Friend (8) Relatives (9) Others (specify) .....

Q23. Are you on ARVs

(1) Yes (2) No (3) About to (eligible)

Q24. If yes when did you start? (Date) .....

Q25. Have you disclosed that you are on ARV?

(1) Yes (2) No

Q26. If Yes, to whom have you disclosed? (tick all that apply)

(2) Spouse/Partner (2) Children (3) Sister

(4) Brother (5) Mother (6) Father

(3) Friend (8) Relatives (9) Others (specify) .....

Q27. If No, why (tick all that apply)

(1) Worries of being stigmatized (chased away, divorced)

(2) Others (specify).....

Q28. Since you knew that you are HIV positive, do you get any kind of support?

(1) Yes (2) No

Q29. If Yes, from where? (tick all that apply)

(1) Household members (2) Relatives (3) Friends

(4) Neighbours (5) CBO/NGO/FBO (6) Others (specify) .....

Q30. What kind of support do you get? (tick all that apply)

(1) Food (2) Medication (3) Counselling/psychosocial support

(4) Clothes (5) Education (6) Transport (7) Spiritual

(8) Legal (9) Others (specify) .....

Q31. Are all members of the household willing to take care of you?

(1) Yes (2) No

Q32. At home are you able to share utensils with other members?

(1) Yes (2) No

Q33. At home, do you share toilets, bathing materials and other utilities with others?

(1) Yes (2) No

Q34. Are the communities around you willing to support you?

(1) Yes (2) No

Q35. Do you feel neglected?

(1) Often (2) Sometimes (3) Rarely (4) No

D: FOOD ACCESSIBILITY

Q36. What is the main source of food for your household?

(1) Own production (2) Purchase (3) Assistance from relatives

(4) Assistance from friends (5) Aid from organizations

(6) Aid from Government (7) Loan/borrow (8) Others (specify) .....

Q37. Do you have adequate food to meet your household requirements?

(1) Yes (2) No

Q38. Have you lost or reduced income as a result of being infected with HIV?

(1) Yes (2) No

Q39. If Yes, explain? .....

Q40. Has your ability to access food reduced compared to the period before knowing that you are infected?

(1) Yes (2) No

Q41. If yes, why do you think so (tick all that apply)

(1) Reduction in ability to produce food

(2) Reduction in ability to earn income

(3) Depletion of household income

(4) Increase in medical and care expenses

(5) Discrimination by household member

(6) Any other reason(s) [specify] .....

E: FOOD SECURITY STATUS

Q42. In the past month, did you worry whether food will run out of stock/would not have enough food?

(1) Often true (2) Sometimes true (3) Never true

Q43. In the past month food bought did not last for the whole month as expected

(1) Often true (2) Sometimes true (3) Never true

Q44. In the past month, did you or any household member cut or skipped meals because there was not enough food or money to buy food

(1) Almost everyday (2) Some but not everyday (3) No

F: COPING STRATEGIES

Q45. How does your household food access food during shortages (tick all that apply)?

(1) Selling household assets

(2) Receiving assistance from friends and relatives

(3) Receiving food assistance/aid from organizations

(4) Borrowing money or food from others

(5) Involved in casual employment

(6) Sending children to work

(7) Other(s) [specify] .....

Q46. How do you cope with food shortage? (tick all that apply)

(1) Eating food that are less preferred

(2) Limiting food portion size

(3) Skipping meals

(4) Borrowing food or money to buy food

(5) Maternal buffering

(6) Others [specify] .....

Q47. How many meals do you have per day?

(1) One meal (2) Two meals (3) Three meals (4) More than three meals

Q48. How many times do you take snacks per day?

(1) Once (2) Twice (3) More than twice

Q49. Are there any changes in the type of meals that you used to consume before and after being infected?

(1) Yes (2) No

Q50. What are the changes? .....

.....

Q51. Do you think that not having adequate food to eat (food shortage) can affect adherence to antiretroviral therapy (ART)

(1) Yes (2) No

Q52. Are you using dietary supplements?

(1) Yes (2) No

G: NUTRITIONAL STATUS

Q53. Weight .....(kg)

Q54. Height ..... (cm)

THANK YOU

Appendix 2: QUESTIONNAIRE (Kiswahili Version)

DODOSO LA KISWAHILI

A: UTAMBULISHO

Tarehe ya Usaili: ____ /____ /2008 **Nambari ya Dodoso:** .....

Jina la Msaili: .....

Jina la Kliniki .....

(1) Amana (2) Buguruni (3) Mwanayamala

(4) Sinza (5) Temeke (6) Mbagala Rangitatu

Manispaa:.....

(1) Ilala (2) Kinondoni (3) Temeke

B: TAARIFA BINAFSI

Q1. Umri (miaka) .....

Q2. Jinsi .....

(1) Mwanamke (2) Mwanaume

Q3. Dini: .....

(1) Mkristo (2) Muislam (3) Nyingine (taja) .....

Q4. Hali ya ndoa .....

(1) Hajaoa/Hajaolewa (2) Ameoa/Ameolewa (3) Mjane/Mgane

(4) Ametengana (5) Ametalaka (6) Anaishi na mwenza

Q5. Kiwango cha elimu .....

(1) Sijaenda shule kabisa (2) Elimu ya msingi (3) Elimu ya ufun

(4) Elimu ya sekondari (5) Chuo/Elimu ya juu

Q6. Kazi unayofanya .....

(1) Mwanafunzi (2) Mkulima (3) Nina ajira rasmi

(4) Ajira isiyo rasmi (5) Mfanya biashara (6) Nyingine (taja) .....

Q7. Uhusiano wako na mkuu wa kaya?

(1) Mkuu wa kaya (Nenda swali la 12)

(2) Mke/Mume (3) Mtoto (4) Ndugu (5) Mwingine (taja) .....

Q8. Jinsi ya mkuu wa kaya yako.....

(1) Mwanamke (2) Mwanaume

Q9. Hali ya ndoa ya mkuu wa kaya yako.....

(1) Hajaoa/Hajaolewa (2) Ameoa/Ameolewa (3) Mjane/Mgane

(4) Ametengana (5) Ametalaka (6) Anaishi na mwenza

Q10. Kiwango chake cha elimu .....

(1) Hajaenda shule kabisa (2) Elimu ya msingi (3) Elimu ya ufundi

(4) Elimu ya sekondari (5) Chuo/Elimu ya juu (6) Sijui

Q11. Kazi anayofanya mkuu wa kaya yako .....

(1) Mwanafunzi (2) Mkulima (3) Ajira rasmi

(4) Ajira isiyo rasmi (5) Mfanyabiashara (6) Nyingine (taja) .....

Q12. Una kipato chochote?

(1) Ndio (2) Hapana (Nenda swali la 14)

Q13. Kadiria kipato chako kwa mwezi (TSh.) .....

(1) < 60,000 (2) 60,000-99,000 (3) 100,000 – 199,000

(4) 200 – 299,000 (5) 300,000 – 500,000 (6) > 500,000

Q14. Je, kaya yako au mwanakaya yeyote anamiliki chochote kati ya vifuatavyo (weka alama kwenye kila kitakachotajwa)

(1) Redio (2) Runinga (TV) (3) Simu

(4) Jokofu (Friji) (5) Baiskeli (6) Pikipiki

(7) Gari (8) Nyumba (9) Shamba

(10) Mifugo (ng'ombe, mbuzi, nguruwe, kuku/bata)

Q15. Je, nyumba yenu ina kati ya vifuatavyo (weka alama kwenye kila kitakachotajwa)

(1) Umeme (2) Sakafu ya mchanga/udongo (3)Sakafu ya siment

(4) Sakafu ya tiles (5) Ukuta wa udongo (6) Ukuta wa mabati

(7) Ukuta wa mawe (8) Ukuta wa matofali/siment (9) Paa la nyasi

(10)Paa la mabati (11)Paa la zege (12)Paa la vigae

Q16. Mko wangapi kwenye kaya yako? .....

(1) Chini ya miaka 5 .....

(2) Miaka 6 – 17 .....

(3) Miaka 18 au zaidi .....

C: UNYANYAPAA

Q17. Ni muda sasa tangu ulipojijua kuwa una VVU? (tarehe ya kupima VVU) .....

Q18. Kwa nini uliamua kupima VVU?

(1) Mwenza alipima/alipendekeza (2) Magonjwa (3) Kampeni ya Upimaji

(4) Sababu ya ajira (5) Sababu ya ndoa (6) Nyingine (taja) .....

Q19. Umepima VVU mara ngapi?

(2) Moja (2) Mbili (3) Tatu (4) Zaidi ya mara tatu

Q20. Ulipima VVU katika kituo/vituo gani?

	Kituo/Site	**Wilaya**	**Mkoa**
Mara ya kwanza			
Mara ya pili			
Mara ya tatu			
Mara ya nne			

Q21. Je, umemueleza mtu yeyote kuhusu hali yako ya uambukizo?

(1) Ndio (2) Hapana (nenda swali la 23)

Q22. Kama ndio, umemwambia nani kati ya wafuatao? (weka alama kwenye kila kitakachotajwa)

(5) Mwenza/Mume/Mke (2) Mtoto/Watoto (3) Dada (4) Kaka

(5) Mama (6) Baba (7) Rafiki (8) Ndugu (9) Mwingine (taja) .....

Q23. Je, unatumia dawa za kupunguza makali ya VVU (ARVs)

(1) Ndio (2) Hapana (3) Nitaanza (nina vigezo)

Q24. Kama ndio umeanza lini (tarehe) .....

Q25. Je, umemwambia mtu yeyote kuwa unatumia ARVs?

(1) Ndio (2) Hapana (nenda swali la 27)

Q26. Kama ndio, umemwambia nani kati ya wafuatao? (weka alama kwenye kila kitakachotajwa)

(1) Mwenza/Mume/Mke (2) Mtoto/Watoto (3) Dada

(4) Kaka (5) Mama (6) Baba

(7) Rafiki (8) Ndugu (9) Mwingine (taja) .....

Q27. Kama hapana, ni kwa nini hujafanya hivyo? (weka alama kwenye kila kitakachotajwa)

(6) Wasiwasi wa kutengwa/ kufukuzwa/kuachwa

(7) Wasiwasi wa kukosa msaada (chakula, matibabu)

(8) Nyingine (taja) .....

Q28. Je unapata msaada au huduma yoyote, tangu umejua kuwa una VVU?

(1) Ndio (2) Hapana

Q29. Kama ndio, unapata msaada au huduma kutoka wapi? (weka alama kwenye kila kitakachotajwa)

(9) Wanakaya (2) Ndugu (3) Rafiki

(10) Majirani (5) Mashirika (CBO/NGO/FBO) (6) Serikali

(7) Kwingine (taja) .....

Q30. Je, Unapata msaada gani? (weka alama kwenye kila kitakachotajwa)

(1) Chakula (2) Matibabu (3) Mavazi

(4) Elimu (5) Usafiri(nauli) (6) Msaada wa kisheria

(7) Msaada wa kisaikolojia (Unasihi) (8) Msaada wa kiroho

(9) Mwingine (taja) .....

Q31. Je, wanakaya wote wako tayari kukuhudumia?

(1) Ndio (2) Hapana (3) Sijui

Q32. Je, unahisi kuwa umetengwa?

(2) Mara nyingi (2)Wakati mwingine (3) Mara chache (4)Sihisi hivyo

Q33. Je, unachangia vyombo vya kulia chakula/Unakula pamoja na wanakaya wengine?

(1) Ndio (2) Hapana

Q34. Je, unachangia choo, bafu, ndoo za kuogea, sabuni na vinginevyo na wanakaya wengine?

(1) Ndio (2) Hapana

D: UPATIKANAJI WA CHAKULA

Q35. Je, mnapataje vyakula kwenye kaya yako? (weka alama kwenye kila kitakachotajwa)

(1) Mnazalisha wenyewe (2) Mnanunua (3) Msaada toka ndugu

(4) Msaada toka kwa marafiki (5) Msaada kutoka mashirika

(6) Msaada toka serikalini (7) Mkopo (8) Nyingine(taja) .....

Q36. Je, vyakula vinavyopatikana kwenye kaya yako vinatosheleza mahitaji yenu?

(1) Ndio (2) Hapana

Q37. Je, kuishi na VVU kumepunguza kipato chako?

(1) Ndio (2)Hapana (nenda swali la 39)

Q38. Kama ndio, eleza ni kwa vipi kipato chako kimepungua .....

.....

Q39. Je, uwezo wa kaya yako kupata chakula upungua ukilinganisha na kipindi ambacho ulikuwa hujui kuwa unaishi na VVU?

(1) Ndio (2) Hapana (nenda swali la 41)

Q40. Kama ndio, mabadiliko hayo yamesabishwa na nini (weka alama kwenye kila kitakachotajwa)

(1) Kupungua kwa uwezo wa kuzalisha chakula

(2) Kupungua kwa uwezo wa kupata kipato

(3) Kupungua kwa kipato cha kaya

(4) Kuongezeka kwa gharama za matunzo na matibabu

(5) Nyingine (taja) .....

E: HALI YA UHAKIKA WA CHAKULA

Q41. Mwezi uliopita umekuwa na wasiwasi kuwa kaya yako haitakuwa na chakula cha kutosha?

(1) Mara nyingi (2) Mara chache (3) Sikuwa na wasiwasi

Q42. Katika mwezi uliopita chakula kilichonunuliwa kiliisha mapema/hakikukaa kama ilivyotarajiwa

(1) Ni kweli kabisa (2) Wakati mwingine ni kweli (3) Siyo kweli

Q43. Katika mwezi uliopita, wewe au mwanakaya yoyote ilibidi ale chakula kidogo au akose baadhi ya milo kwa sababu ya upungufu wa chakula au hela za kununulia chakula

(1) Imetokea karibu kila siku (2) Imetokea mara chache (3) Hapana

F: JINSI YA KUKABILIANA

Q44. Mnapataje chakula kunapotokea upungufu wa chakula katika kaya (weka alama kwenye kila kitakachotajwa)

(1) Tunauza mali za kaya kupata fedha za kununua chakula

(2) Tunapewa na marafiki au ndugu

(3) Tunapewa msaada wa chakula na mashirika

(4) Tunakopa fedha au chakula kutoka kwa wengine

(5) Wanakaya wanafanya vibarua

(6) Watoto wanatumwa kufanya kazi zenye ujira

(7) Nyingine (taja) .....

Q45. Mnakabiliana vipi na upungufu wa chakula katika kaya (weka alama kwenye kila kitakachotajwa)

(1) Tunakula vyakula ambavyo hatupendelei

(2) Tunapunguza kiasi cha chakula

(3) Tunaacha kula baadhi ya milo

(4) Tunakopa chakula au hela za kununulia chakula

(5) Mama anajinyima ili wengine wale zaidi

(6) Nyingine (taja) .....

Q46. Unakula milo mingapi kwa siku?

(1) Mlo mmoja (2) Milo miwili (3) Milo mitatu (4) Zaidi ya milo 3

Q47. Unakula asusa (snacks) mara ngapi kwa siku?

(1) Mara moja (2) Mara mbili (3) Zaidi ya mara mbili

(4) Sili kabisa

Q48. Kuna mabadiliko yoyote katika aina ya milo unayokula sasa na kabla ya kuambukizwa VVU?

(1) Ndio (2) Hapana

Q49. Kama ndio, ni mabadiliko gani?

.....

.....

Q50. Je, unafikiri kutokuwa na chakula cha kutosha kunaweza kuathiri unywaji wa dawa za kupunguza makali ya VVU?

(1) Ndio (2) Hapana

Q51. Je, unatumia virutubishi vya nyongeza (Supplements)

(1) Ndio (2) Hapana

G: HALI YA LISHE

Q53. Uzito ..... (kilo)

Q54. Urefu ..... (sm)

AHSANTE

Appendix 3: INFORMED CONSENT FORM (English Version)

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

CONSENT FORM

ID-NO ☐☐☐

Consent to participate in study

Consent to participate in this study

Greetings! My name is ….. I am working on this research project with the objective of investigating nutritional status and associated factors among Injecting drug users in Dar es Salaam Region.

Purpose of the study

This study has the purpose of collecting information on **nutrition status, food security and coping strategies among people living with HIV in Dar es salaam, Tanzania.** You are being asked to participate in this study because you have information that may be important to the study.

What Participation Involves

If you agree to participate in this study, you will be required to answer questions regarding your personal information including food security and coping strategies. The

responses will be recorded in the questionnaire. You will be also taken measurements of your height and weight for assessing your nutritional status.

Confidentiality

All information collected from you will be treated confidentially. Only people working in this research study will have access to the information. The information will be entered into computers with only the study identification number.

Risks

We do not expect that any harm will happen to you because of participating in this study.

Rights to Withdraw and Alternatives

Taking part in this study is completely voluntary. You can stop participating in this study at any time, even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

There may be no direct benefit to you from participating in this study. However, the information you provide will help to increase the understanding on nutritional status, food security and coping strategies among people living with HIV, which will assist in designing effective interventions for improving nutritional status of population group under study.

In Case of Injury

We do not anticipate that any harm will occur to you or your family as a result of participation in this study. There will be no additional compensations to you or your family

Who to contact

If you ever have questions about this study, you should contact the study Coordinator or the Principal Investigator, **TUZIE EDWIN,** Muhimbili University of Health and Allied Sciences (MUHAS), P.O. Box 65001, Dar es Salaam (Tel. no. 0754 307205 or 0713 654549). If you ever have questions about your rights as a participant, you may call **Prof. E .F. LYAMUYA,** Chairman of the College Research and Publications Committee, P. O. Box 65001, Dar es Salaam. Tel: 2150302-6.

Do you agree?

Participant agrees..... Participant does not agree .....

I _____ have read the contents in this form.

My questions have been answered. I agree to participate in this study.

Signature of Participant _____

Signature of witness (if participant cannot read) _____

Signature of Research Assistant _____

Date of signed consent _____

Appendix 4: INFORMED CONSENT FORM (Kiswahili Version)

Fomu ya ridhaa

CHUO KIKUU CHA AFYA NA SAYANSI YA TIBA CHA MUHIMBILI

KURUGENZI YA UTAFITI NA UCHAPISHAJI

Namba ya utambulisho ☐☐☐

Ridhaa ya kushiriki kwenye utafiti

Hujambo! Ninaitwa **TUZIE EDWIN** mwanafunzi wa shahada ya uzamili ya Afya ya Jamii katika Chuo Kikuu cha Afya na Sayansi ya Tiba cha Muhimbili.

Madhumuni ya Utafiti.

Utafiti huu unalenga kuainisha **hali ya lishe, uhakika wa chakula na mikakati ya kukabiliana na upungufu wa chakula miongoni mwa watu wanaoishi na VVU.**

Nini kinahitajika ili kushiriki.

Ili kushiriki katika utafiti huu inabidi kukubali na kujiunga kwa kujibu maswali yaliyotungwa kwa ajili ya utafiti huu. Utapimwa urefu na uzito ili kutathmini hali ya lishe.

Usiri

Taarifa zitakazokusanywa kupitia dodoso hili zitakuwa siri na hakuna mtu yeyote atakayeambiwa ulichosema. Taarifa zitaingizwa kwenye ngamizi kwa kutumia namba za utambulisho.

Hatari

Hakuna hatari yoyote itakayotokea.

Haki ya kujitoa au vinginevyo.

Ushiriki katika utafiti huu ni wa hiari. Kutoshiriki au kujitoa kutoka kwenye utafiti hakutakuwa na adhabu yeyote na hutapoteza stahili zako, endapo utaona ni vyema kufanya hivyo.

Faida

Kama utakubali kushiriki kwenye utafiti huu itakuwa ni faraja kwa vile una nia ya kuongeza taarifa kuhusu hali ya lishe, uhakika wa chakula wa chakula na mikakati nya kukabiliana na upungufu wa chakula minoni mwa vatu wanoishina VVU ili kuweza kutengenza mikakati yenye lengo la kuboresha hali za lishe za vatu hao.

Endapo utapata madhara

Hutegemewi kupata madhara yoyote kutokana na ushiriki wako katika utafiti huu.

Nani wa kuwasiliana naye

Kama una maswali kuhusiana na utafiti huu itakubidi kuwasiliana na Mtafiti mkuu wa utafiti huu **TUZIE EDWIN** wa Chuo Kikuu cha Afya na Sayansi ya Tiba Muhimbili, SLP 65001, Dar es salaam. Kama una swali kuhusu staili zako kama mshiriki unaweza kuwasiliana na **Prof. E. F. LYAMUYA**, Mwenyekiti wa kamati ya utafiti na uchapishaji, S.L.P 65001, Dar es Salaam, Simu 2150302-6

Je umekubali?

Mshiriki amekubali ..... Mshiriki hajakubali .....

Mimi _____ nimesoma maelezo ya fomu hii. Maswali yangu yamejibiwa.Nakubali kushiriki katika utafiti huu.

Sahihi ya mshiriki.....

Sahihi ya shahidi (Kama Mshiriki hawezi kusoma/kuandika) .....

Sahihi ya mtafiti msaidizi.....

Tarehe ya kutia sahihi ya kushiriki.....