

# The effects of nutritional knowledge on the dietary practices of people living with HIV in Kayole division, Nairobi-Kenya

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**Abstract:** *Introduction and background:* Appropriate nutrition knowledge influences the dietary intake in all income setups. This further influences the dietary adequacy and nutrition status. Nutritional knowledge is very important to People Living with HIV (PLHIV). It must be meaningful to influence their dietary practices. This is through the adaption of optimal dietary practices. Dietary practices also influence the nutrition status, enhance drug metabolism and efficacy. Information on the influence of nutrition knowledge on dietary practices of PLHIV is scarce. *Objective:* Thus, this study sought to establish the association between nutrition knowledge and individual dietary practices components of HIV patients in low income settings. *Methods:* A cross-sectional analytical study was conducted among 149 persons with Human immunodeficiency virus (HIV) and attached to Women Fighting HIV/AIDS in Kenya (WOFAK) centre in Kayole division. The researcher administered questionnaires which had been pretested and assessed for validity and reliability in data collection on 149 PLHIV. Spearman's rho was used to establish the relationship between nutrition knowledge and dietary practices. *Results:* The relationship between nutrition knowledge and the number of meals consumed in a day (0.001), the frequency at which fruits (0.001), vegetables (0.003), legumes (0.003), animal products (0.001) and were-deleted cereals (0.020) consumed was positive and significant ( $p < 0.05$ ) respectively. Nutrition knowledge influences the dietary practices of HIV patients. This is by increasing the choice and intake of foods that are nutrient dense; that boost the immunity while preventing loss of muscle and also restricting on foods that would impact their nutrition status negatively. *Conclusions and recommendations:* Dietary practices were more optimal as the nutrition knowledge increased. Appropriate nutrition information should be communicated to PLHIV at the point of contact with care centres. PLHIV in low income settings should be guided in the choice of nutritious affordable foods within their economic capacity. Follow up should be provided to ensure that nutritional knowledge impacted on PLHIV is translated to dietary practices for better health outcome.

**Keywords:** Nutritional Knowledge, Dietary Practices, People Living with Human Immunodeficiency Virus (PLHIV), Kenya

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## 1. Introduction

Human immunodeficiency virus (HIV) is one of the world's most overwhelming epidemics. An estimated 0.8% of the total adults' population worldwide is living with HIV [1]. Sub-Saharan Africa is adversely affected. Adequate nutrition helps to maintain and improve the nutritional and immunological status of a person with HIV/AIDS and delays the progression from HIV to AIDS-related diseases. Good Nutrition can therefore improve the quality of life of People

Living with HIV (PLHIV). Adequate nutrition complements the effects of antiretroviral therapies, maintains body weight and improves the performance of the immune system already compromised by the infections [2]. Morbidity and mortality related to HIV infection remain unacceptably high. There are major advances in HIV therapy and increased international funding for care in developing countries [3-4]. These advances in the treatment of HIV infection have resulted in

antiretroviral therapy (ART) combinations. ART reduces HIV RNA level and improves immunologic function. Dramatic improvements in health, reductions in morbidity and prolonged life have been observed in PLHIV and on ART [5-6]. A review of approaches to nutrition in HIV programs in Africa concluded that HIV/AIDS policies “have tended toward highly medicalized approaches” and called for a comprehensive approach to link health strategies with community-oriented food-based strategies [7] (nutrition). In Kenya, selected government health facilities have Comprehensive Care Centers (CCCs). These provide counseling on nutrition and feeding practices as part of the comprehensive package in the management of HIV infected persons. Nutrition counseling is specifically provided in the selected centres.

There has been a growing recognition that individuals receiving ART face serious adverse effects, resulting in lack of adherence when faced with a lack of food in the household [8-10]. Food facilitates the absorption and effectiveness of drugs thus reversing loss of body mass and to promote recuperation and enhanced immune function [11-12]. This study sort to establish whether nutrition knowledge of HIV infected persons is proportionally translated to their dietary practices.

## 2. Materials and Methods

### 2.1. Study Population and Design

A cross-sectional, analytical study, targeting 149 people living with HIV in Kayole Division Nairobi County, Kenya was conducted. The respondents (both males and females) were members of Women Fighting HIV/AIDS in Kenya (WOFAK) centre from where they received health care services related to HIV treatment. WOFAK had clinic based and home based services. For one to be included in the study population, he/she had to be HIV positive, above 18 years of age and not school going. These also had to be residents of Kayole division, Nairobi. Purposeful sampling was first used for the selection of the study population. Random sampling was carried out to identify 149 households from the sample frame. Those who were bed ridden and could not complete the whole questionnaire were eliminated from the study. The researcher administered questionnaires which had been pretested and assessed for validity and reliability in data collection.

### 2.2. Determination of Nutrition Knowledge

Knowledge was assessed by use of knowledge questions where a grading method was used to develop a nutritional knowledge index. A list of 12 nutrition related questions were presented to the respondents and responses marked and scored. For every correct question, 1 mark was given. The total mark over 12 was expressed as a percentage and then rated on the scale of “0-100” using four cut –off points ; No nutritional knowledge at all “0”; Low nutritional knowledge

“<40”; Average nutritional knowledge “40-69” and High nutritional knowledge “>70”.

### 2.3. Dietary practices

Food intake was collected by use of a food frequency questionnaire (FFQ). The FFQ contained various types of food items consumed in the area of study. The respondent was asked to recall the usual frequency the food was consumed through the week (recall period). For the food diversity the number food groups during the 24 hours preceding the study (regardless of the frequency) were recorded for each respondent. Twelve food groups were assessed so as to have a 12-point dietary diversity score. Nutrient intake and adequacy was determined by use of a 24-hour recall. Actual nutrient intake was compared with the individual’s daily nutrient requirement.

### 2.4. Statistical Analysis

The SPSS software (version 16) was used for analyses. A bivariate analysis (Spearman’s rho (p)) with  $p < 0.05$  was used for determining the interactions between the nutritional knowledge and the components of dietary practices of the participants.

### 2.5. Ethical Approval

Ethical clearance was sought and granted by the Kenya National Council for Science and Technology. University of Nairobi, department of food Science and Technology; Applied Nutrition Section also approved the study before data collection process began. Consent was obtained from the Participants before recruitment to the study.

## 3. Results

### 3.1. Characteristics of the Respondents

Table 1. Individual characteristics of the respondents

N=149	n	%
Gender		
Male	37	25
Female	112	75
Age in years		
18-30	61	41
31-45	75	50
>45	13	9
Marital status		
Married	64	43
Single	37	25
Separated	30	20
Divorced	15	10
Widowed	3	2
Source of Income		
Self employment	63	42
Casual work	37	25
Formal employment	27	18
Friends and relatives	21	14
Pension	1	1

Majority of the respondents were females (75%), aged 31-

45years (50%) and married (43) respectively. The main source of employment was self employment (42%) followed

by casual labour (25%) as shown in table 1. The mean age for all respondents was 34.4±8.5.

**Table 2.** Correlation between nutrition knowledge and dietary practices of People living with HIV- Table presentation modified

Nutrition Knowledge	Dietary factors						
	Dietary diversity 0.008* (0.764)		Meals per day 0.001** (0.326)		Micronutrient supplementation 0.314 (0.184)		
	Dietary adequacy						
	Calories 0.047* (0.277)	Protein 0.030* (0.778)	Vitamin A 0.007* (0.656)		Vitamin C 0.002** (0.587)	Iron 0.04* (0.450)	
	Frequency of food consumption per week						
	Fruits 0.001** (0.874)	Vegetables 0.003** (0.612)	Legumes 0.003** (0.243)	Animal products 0.001** (0.268)	Cereals 0.020* (0.191)	Roots & tuber 0.121 (0.127)	Oils & fats 0.293 (-0.087)

Spearman's rho \*Significant at P<0.05, \*\* Significant at P<0.001, Numbers in parentheses are the correlation coefficients. Others are significant levels

### 3.2. Association between Nutrition Knowledge and Dietary Practices

Association between nutrition knowledge and dietary diversity, dietary intake, food frequency and number of meals consumed per day was established. The study showed that the association between nutritional knowledge and dietary practices was positive and significant at P<0.05 as shown in table 2.

The relationship between nutrition knowledge and the number of meals consumed in a day was positive and highly significant. The survey further showed that there was a significant and positive association between the nutrition knowledge of the respondents and the frequency at which they consumed fruits, vegetables, legumes, animal products, vegetables and cereals. The relationship between nutrition knowledge and the frequency at which fats and oils were consumed was negative. There was a weak, positive and non significant relationship between nutrition knowledge of the respondents and the dietary supplements intake.

## 4. Discussion

Poor nutritional knowledge and dietary practices plays a key role in the rapid progression of HIV. These aspects are also among the key factors that determine the quality of life among PLWHA, although they have been largely overlooked, especially in resource-limited settings [13]. The nutrients of concern in this study were energy, protein vitamin A, vitamin C, iron, vitamin B complex, zinc, and selenium due to substantial evidence that specific nutritional deficiencies may accelerate disease progression and hasten the onset of AIDS and death. Interactions between immune function and specific nutrient deficiencies in HIV-1 disease have been reported for trace elements (selenium and zinc) and vitamins A, B6, and B12. Selenium deficiency has been demonstrated to be a significant predictor of HIV-related mortality independent of CD4 cell count over time, CD4 cell count of less than 200cells/ $\mu$ L at base-line, and antiretroviral treatment [14-15].

The association between nutrition knowledge and dietary practices (dietary intake, number of meals, dietary diversity and food frequency) in this study reveals that nutrition knowledge influences the dietary practices. Another study in

France also revealed that nutrition knowledge influences dietary behavior [16]. This study showed a significant and positive association between the nutrition knowledge of the respondents and the frequency at which they consumed fruits, vegetables, legumes, animal products and cereals. These foods play key roles in weight maintenance, rebuilding of the worn out tissues due to the virus and strengthening the immune system. These also remain key areas to focus on in dietary management of people with HIV/AIDS. This could be attributed to the nutrition counseling and education undertaken to advocate for small frequent meals due to the opportunistic infections that could affect dietary intake, appetite and further the dietary adequacy. Adults with HIV/AIDS also suffer from appetite loss (anorexia) and have difficulty eating; thus they eat less and fail to meet their dietary requirements. This is due to infections, such as mouth sores or fever. Side effects from medications used to treat an illness may cause a reduction in appetite [17]. Nutrition knowledge influences the choice of nutrient dense foods that are high in nutrients compared to their weight. It also influences the number of meals consumed in a day. As nutrition knowledge increases PLHIV tend to consume more meals in a day as opposed to the traditional three meals in a day. This practice addresses the poor appetite and other opportunistic infections which contribute to the consumption of reduced quantities. Small quantities of nutrient dense foods when consumed more frequently contributes to dietary adequacy.

The other reason for the significant association between the nutrition knowledge and the food frequency was due to the fact that as the nutrition knowledge levels increase, HIV infected people increase on the frequency intake of different foods that provide different nutrients. A good knowledge of nutritional requirements for an individual with a chronic disease of which HIV is part has been found to be vital for proper management of the disease as well as prevention of complications [18-19].

This study further revealed that the higher the respondents had higher nutrition knowledge the more informed choices they made with regard to food intake. The frequency at which the staples were consumed was higher than the other very important nutrients (from animal sources, fruits and vegetables) in the management of HIV. Another study in Eastern Uganda also showed a higher dependency

on starchy staples like maize, rice, sweet potatoes compared to foods of animal origin and fruits [20]. Interestingly there was a negative relationship between the nutrition knowledge and intake of oils and fats, and indicator of decrease of fats and oils intake with increase in nutritional knowledge. Though fats and oils are high sources of energy, fat has a negative effect on health and consequently on medication and appetite. Thus increased nutrition knowledge is translated to well-versed choices with regard to food intake.

The relationship between nutrition knowledge of the respondents micronutrient supplementation was weak and non significant. This is because the supplements taken by PLHIV are not influenced by the nutrition knowledge. Professional health workers in the care centre prescribe based on the patient's complaints, symptoms and signs of nutritional deficiencies. Nutrition interventions for PLHIV are nutrition counseling, prescribed and targeted nutrition supplements, and linkages with food-based interventions and programs [21-22].

This study reveals that nutrition knowledge influences the dietary diversity. As an individual's nutrition knowledge increase, the consumption of foods from different food groups increases. As a result of this, variety of nutrients is obtained and thus nutrient adequacy is attained. This agrees with a study by Yoon *et al* which also revealed an association between nutrition knowledge and dietary diversity [23]

Nutrition knowledge levels did not influence the Intra household food distribution pattern in households. As a result of this only 3.4% of the respondents nutrition requirements were considered in household food distribution. Focused intrahousehold distribution will ensure that PLHIV are provided with the suitable portions to meet the nutrient requirement regardless of their positions in the family. Improved intra-household food distribution ensures good and adequate nutritious foods for the PLHIV [24].

The study also showed that there was a significance association between nutrient knowledge and dietary adequacy. This could be due to the fact that though the subjects were from low income setting, careful food choices were made. The knowledge on the foods to consume so as to meet their nutrient requirements manipulated the quantity and choice of food consumed to meet the required daily allowances. Ready cooked street foods in affordable portions and prices were available along the streets and in close proximity to residential places. This boosted the low purchasing power of the study population. This was confirmed by the inconsistent main sources of income as being casual work and self employment. As a result, there is no constant income among the respondents and explains the reason for cheap ready cooked street foods. This study disagrees with a study by Dammann and Smith disclosed a disconnect between diet and health among low-income setups [25].

## 5. Conclusion and Recommendation

This study shows that there is a strong relationship between nutrition knowledge and the dietary practices. This

is a clear indication that nutrition knowledge has an influence on the dietary practices of PLHIV. Nutrition information should thus be a key component to the care of PLHIV and should be initiated at the entry point to the comprehensive care. Nutrition education should be continuous throughout the period of care. Nutrition interventions that educate low-income families on inexpensive, healthful eating should be embraced. Changes at policy level should be well thought-out to increase affordability and accessibility of healthful food in low-income settings. Further, registered nutritionist and dietitians should be part of the professional team in providing comprehensive care to PLHIV. Further research should be conducted to measure the actual impact of nutrition education on the nutrition status of PLHIV.

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