

# Dietary Practices and Nutrition Status of People Living with HIV/AIDS Aged 18-55 Years Attending Kisii Teaching and Referral Hospital, Kisii County

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## ABSTRACT

HIV infection and malnutrition are strongly linked and highly prevalent in Sub-Saharan Africa. Nutrition is a key component of comprehensive care for people living with HIV/AIDS (PLWHA). A varied and healthy diet has been strongly associated with nutrient adequacy and delay in HIV/AIDS progression. This study aimed to assess dietary practices and nutrition status among adult HIV/AIDS patients aged 18-55 years old, attending a comprehensive care center (CCC), at Kisii Teaching and Referral Hospital (KTRH), Kenya. A cross-sectional descriptive study was conducted on 68 study participants randomly selected. A structured interviewer-administered questionnaire was used to collect data. Data was analyzed using SPSS version 24.0 statistical software. A total of 68 study participants were included in the analysis and 64.7% were female. The majority of the participants (42.7%) were between 19 – 31 years of age. Nearly two thirds (61.8%) of the respondents consumed three meals a day, and a quarter (25%) consumed less than three meals a day. The majority of the respondents consumed cereals/cereal products more than any other food group. The prevalence of undernutrition was 7.4%, overweight was 25% and 14.7% were obese. These results could be a reflection the nutritional transition Kenya is experiencing, predisposing PLWHA to cardio-metabolic risk factors. These results highlight the need to strengthen community nutrition programmes to further improve accessibility and availability of affordable varied and sustainable healthy diet to better health for PLWHA.

**Keywords:** Dietary practices, food consumption patterns, nutritional status, PLWHA, Kenya

## INTRODUCTION

Globally, HIV/AIDS is a major public health concern,<sup>1,2</sup> and more so in Sub Saharan Africa. <sup>2-3</sup>HIV/AIDS increases nutrient demand and predisposes people living with HIV/AIDS (PLWHA) to high risk due to the consumption of low quality, monotonous food which leads to micronutrient and macronutrient deficiencies. A varied and healthy diet has been strongly associated with nutrient adequacy.<sup>1,4-6</sup>

HIV infection and malnutrition are strongly linked,<sup>1,4, 5,7</sup> and highly prevalent in Sub Saharan Africa.<sup>4</sup> Inadequate dietary

intake to meet increased metabolic demands associated with HIV/AIDS, compromises the nutrition of PLWHA and results in deteriorating health, wellbeing and development.<sup>1,4</sup> Nutrition is an important component of comprehensive care for PLWHA and the key to sustaining the ability to continue participating in the workforce and contributing to socio-economic development.<sup>6</sup> Poor nutritional status may speed up the progression of AIDS-related illnesses.<sup>1,3,5,6</sup>

Food consumption patterns reflect on dietary practices, and household access to diversified foods, as well as being

nutritional adequacy of an individual diet.<sup>5,6</sup> The level of dietary diversity and food consumption patterns among PLHWA plays a crucial role in improving the quality of nutrition care, counseling and supporting activities provided by health care providers. Additionally, it provides support to PLHWA to take simple actions to improve their nutrition, health, quality of life, physical and social capacity.<sup>1,4</sup>

The Government of Kenya designed and implemented different nutritional strategies and programmes to promote nutrition, health and quality of life of all PLHWA. However, there are few studies that have assessed dietary practices among PLHWA in the Kisii region. Therefore, this study aimed to assess dietary practices and nutrition status among PLHWA in the area in order to fill the knowledge gap.

## METHODOLOGY

### Study design, Setting and Participants

A cross-sectional descriptive study was carried out among adults aged 18-55 years living with HIV/AIDS attending the comprehensive care center (CCC), at Kisii Teaching and Referral Hospital (KTRH). A total of 68 participants were randomly selected in this study. All participants who consented on the day of the visit were invited to participate.

### Data collection procedure and techniques

Data were collected using structured interviewer-administered questionnaire to collect data from the participants. The data captured socio-demographic characteristics, dietary practices and health measurements including: height, weight, Body mass index (BMI). Dietary practices were assessed by the use of FFQ (food frequency questionnaire). Height and weight were measured following WHO standardized techniques procedures. Anthropometric tools used were calibrated and checked before being utilized. The height was recorded to the nearest 0.1cm. while the weight was recorded to the nearest 0.01kg.

## Data analysis

Data were analyzed using SPSS version 24.0 (IBM SPSS Inc, IL, USA) software. Descriptive statistics were used to describe the characteristics of the study population. The results were presented as means (95% confidence intervals) for quantitative variables and percentiles for the continuous data.

## Ethical considerations

The research proposal was approved by the Ethical Review Committee of Kenya Medical Training College (KMTTC), Department of Nutrition and Dietetics, Thika Campus. Research permit and authorization was obtained from the National Commission of Science and Technology (NACOSTI). Research authorization was also obtained from the ethical review committee of Kisii Teaching and Referral Hospital (KTRH). Participants gave informed consent for inclusion in the study. This study was undertaken in accordance with Helsinki Research ethics and guidelines.

## RESULTS

### Participants Profile

Table 1: Sociodemographic and economic characteristics of participants

Variable	Frequency (N=68)	Percent
<b>Gender</b>		
Male	24	35.3
Female	44	64.7
<b>Age of respondents</b>		
19 - 31	29	42.7
32 - 44	23	33.8
45 -55	16	23.5
<b>Marital Status</b>		
Single	25	36.8
Married	21	30.9
Divorced	2	2.9
Separated	8	11.8
Widowed/widower	12	17.6
<b>Education Status</b>		
No formal education	10	14.7
Primary education	15	22.1
Secondary education	25	36.8
Tertiary education	18	26.5
<b>Occupation</b>		
Employed	7	10.3
Self employed	24	35.3
Casual employment	8	11.8
Unemployed	29	42.6
<b>Monthly Income</b>		
Below KES 10,000	59	88.1
KES 10,001-20,000	7	10.4
KES 20,001 – 30,000	1	1.5

A total of 68 adults living with HIV/AIDS were included in this study. In this study 44 (64.7%) were female. The majority of the participants (42.7%) were found in the age range of 19-31 years old. A third (36.8%) were single, 36.8% had completed secondary school education and 42.6% were unemployed. A majority 88.1% earned a minimal income of KES 10,000 and below.

### Food and dietary patterns

#### Number of meals consumed in a day

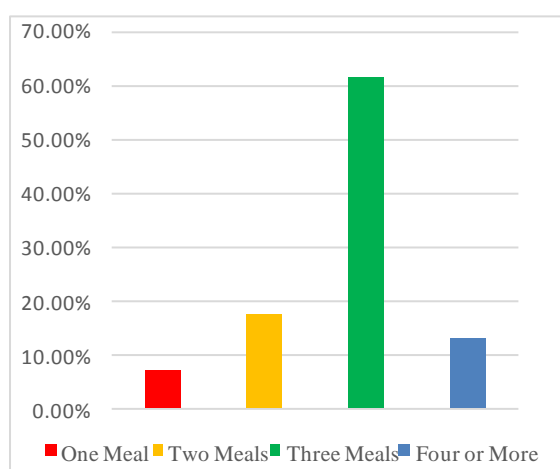


Fig.1 Number of Meals consumed by study participants in a day

The majority of the respondents (61.8%) consumed three meals a day, 25% had less than three meals a day, and only 13.2% could have more than three meals a day. (Fig. 1)

### Food Consumption Patterns

The results in table 2, indicate food consumption patterns from dietary diversity food groups. The food frequency consumption varied from daily (5 -7 days a week), weekly (1-4 days per week), monthly (consumed a couple of times in a month), seasonally and never.

The majority of the respondents consumed cereals or their products (84.8%), more than any other food group. Daily consumption of 18.2% and 23.7% of the participants consumed cereals 1 – 4 times per week. Of the cereals and cereal products, ugali (dough made from maize meal mixed with water) was the most consumed, with 79.5% of the respondents reported consuming it on a daily basis. Bread and Mandazi consumed by 22.1% and 20.6% by the participants respectively.

Table 2: Average food frequency consumption patterns

Food Group	Frequency of Consumption				
	Daily	Weekly	Monthly	Seasonally	Never
Cereals	18.2%	23.7%	22.2%	20.7%	15.2%
White Roots and Tubers	4.4%	20%	19.7%	35.3%	19.7%
Vitamin A rich vegetables and Tubers	5.15%	25%	25.7%	25%	19.1%
Dark Green Leafy Vegetables	7.6%	25.0%	24.7%	21.2%	21.5%
Other Vegetables	3.9%	10.8%	19.1%	33.3%	32.4%
Vitamin A rich fruits	8.8%	25.0%	22.5%	29.4%	14.2%
Other fruits	10.1%	26.8%	20.2%	28.7%	13.8%
Organ Meat	1.5%	17.6%	30.9%	35.2%	14.7%
Flesh Meats	2.9%	13.5%	28.8%	28.2%	25.9%
Eggs	13.2%	23.5%	16.2%	25.0%	20.9%
Fish and Seafood	1.5%	26.5%	30.9%	22.1%	19.1%
Legumes, Nuts, and Seeds	3.4%	19.2%	17.9%	25.0%	34.7%
Milk and Milk products	10.8%	16.2%	22.0%	26.5%	24.5%
Oils and Fats	19.5%	10.0%	16.2%	19.1%	35.3%
Sweets	3.3%	3.5%	8.0%	14.7%	51.8%

White root tubers were reported to be consumed among 80.3% of the participants, of which 35.3% consumed them seasonally, 20% weekly, and 4.4% consumed them daily. Of the white tubers, plantains were the most consumed among the respondents, 11.8% consumed plantains

daily and 30.9% consumed plantains on a weekly basis (1-4 days in a week), with the yams being the least consumed (23.5%) and arrowroots (22.1%).

Vitamin A-rich vegetables and tubers were widely consumed by 80.8% of the participants, of which 25% consumed

them seasonally, 25.7% monthly, 25% weekly, and 5.1% daily. Sweet potatoes being the most consumed of this group (86.8%), of which 7.4% consume them daily, 26.5% consume them weekly, 27.9% consume them monthly and 25% seasonally.

Seventy-eight percent of the participants reported that they consume dark green leafy vegetables. Of which the majority consume it on a weekly basis (25%), and 7.6% consume it daily. Kales were the most frequently consumed vegetables in this group, with 33.8% consuming it daily and 41.2% consuming it weekly. Indigenous vegetables were also frequently consumed by the participants. Spider Plant leaves were reported to be commonest consumed among the dark green leafy vegetables and indigenous vegetables (95.6%), followed by nightshade (93.6%), cowpea leaves (91.2%), and amaranthus (86.8%).

In the vitamin A-rich fruits group, 85.7% of the participants consumed them. Of these, 8.8% consumed daily, and 25.0% consumed weekly. Pawpaw and mango fruits were mostly consumed, among 89.7% of the participants. Other fruits which were also reported to be widely consumed among the participants (86.2%) with 13.7% reporting they don't consume any fruits in this group. Ripe bananas were the most consumed of the other fruits, with 98.5% of the participants consuming them, followed by oranges (94.1%), guavas (89.7%), and avocados (88.2%). In this group, ripe bananas and avocados had high daily and

weekly consumption frequency compared with other fruits in this group. Twenty-five percent of the participants reported consuming ripe bananas daily and 39.7% weekly and 22.1% consumed avocado daily and 41.2% weekly.

Approximately 26% did not consume flesh meat, with mutton being the least consumed flesh meat among 38.2% of the participants. Eggs were consumed daily by 13.2% of the participants, 16.2% weekly, and 25% monthly. Fish was also consumed in a majority of the participants (80.9%), with 1.5% consuming it daily, 26.5% weekly, and 30.9% monthly. Seventy-five percent of the participants reported that they consume milk and milk products, of which fresh milk was the most consumed (82.4%), sour milk consumed by 70.6%, and yoghurt among 73.5% of the participants.

Legumes, nuts, and seeds were fairly consumed among nearly two thirds (65.3%) of the research participants. Soybean was the least consumed legume, with 44.1% reporting they have never consumed it, followed by lentils 42.6%, dried peas (41.2%), and black beans (39.7%).

On average, nearly two thirds (64.7%) consume oils and fats in their diets. A majority (86.8%) reported using cooking oils as part of their diet, of which 57.4% use it daily. Half of the participants. (50%) reported using cooking fat, of which 14.7% used it daily, 7.4% weekly and 50% never use it. Cooking oil was used by 87.8% study participants and 57.4% use it on a daily basis.

**Table 3: Dietary Diversity and Food Frequency Consumption Patterns**

Food Group	Frequency				
	Daily	Weekly	Monthly	Seasonally	Never
<b>CEREALS</b>					
Ugali (Maize)	79.5%	2.9%	8.8%	4.4%	4.4%
Ugali (Millet)	4.4%	13.2%	29.4%	25.0%	27.9%
Ugali (Sorghum)	8.8%	4.4%	22.1%	27.9%	36.8%
Porridge (Maize)	20.6%	23.5%	17.6%	17.6%	20.6%
Porridge (Millet)	20.6%	19.1%	17.6%	23.5%	19.1%
Porridge (Sorghum)	10.3%	22.1%	19.1%	22.1%	26.5%
Bread	22.1%	29.4%	22.1%	19.1%	7.4%
Mandazi	20.6%	27.9%	20.6%	25.0%	5.6%
Maize (Boiled/Roasted)	11.9%	28.4%	26.9%	25.4%	7.5%
Rice	4.4%	44.1%	29.4%	11.8%	10.3%
Chapati	5.9%	41.2%	29.4%	17.6%	5.9%
Githeri	8.9%	27.9%	23.5%	29.4%	10.3%
<b>Table 3: to be continued...</b>					

<b>WHITE ROOTS AND TUBERS</b>					
Arrow roots	2.9%	14.7%	19.1%	38.2%	22.1%
Irish Potato	2.9%	25.0%	22.1%	32.4%	17.6%
Cassava	4.4%	17.6%	20.6%	38.2%	19.1%
Yams	0%	11.8%	17.6%	47.1%	23.5%
Green banana(plantain)	11.8%	30.9%	19.1%	20.6%	16.2%
<b>VITAMIN A RICH VEGETABLES AND TUBERS</b>					
Pumpkin	2.9%	23.5%	23.5%	25.0%	25.0%
Sweet potato	7.4%	26.5%	27.9%	25.0%	13.2%
<b>DARK GREEN LEAFY VEGETABLES</b>					
Kales ( <i>Sukuma</i> )	33.8%	41.2%	10.3%	5.6%	8.8%
Nightshade ( <i>Managu</i> )	8.8%	42.6%	29.4%	11.8%	7.4%
Spider plant leaves ( <i>Saga</i> )	2.9%	32.4%	45.6%	14.7%	4.4%
Cowpea Leaves ( <i>Kunde</i> )	4.4%	25.0%	35.3%	26.5%	8.8%
Pumpkin leaves	7.4%	23.5%	29.4%	22.1%	17.6%
Amaranthus ( <i>Terere</i> )	4.4%	27.9%	23.5%	30.9%	13.3%
Spinach	8.8%	23.5%	27.9%	23.5%	16.2%
<b>OTHER VEGETABLES</b>					
Green beans	2.9%	16.2%	19.1%	33.8%	27.9%
Green peas	5.9%	13.2	22.1%	33.8%	25.0%
Cabbage	5.9%	14.7%	26.5%	35.3%	17.6%
Mushroom	0%	4.4%	8.8%	30.9%	55.9%
<b>VITAMIN A RICH FRUITS</b>					
Mango	5.9%	32.4%	25.0%	26.5%	10.3%
Pawpaw	7.4%	32.4%	27.9%	22.1%	10.3%
Passion fruits	13.2%	10.3%	14.7%	39.7%	22.1%
<b>OTHER FRUITS</b>					
Apples	4.4%	14.7%	19.1%	39.7%	20.5%
Avocado	22.1%	41.2%	10.3%	13.2%	11.8%
Banana	23.5	39.7%	19.1%	16.2%	1.5%
Guava	4.4%	23.5%	26.5%	35.3%	10.3%
Lemon	1.5%	23.5%	23.5%	26.5%	25.0%
Pineapple	5.9%	14.7%	26.5%	33.8%	19.1%
Watermelon	5.9%	25.0%	16.2%	36.8%	16.2%
Orange	13.2%	32.4%	20.6%	27.9%	5.9%
<b>ORGAN MEATS</b>					
Liver	1.5%	17.6%	30.9%	35.2%	14.7%
<b>FLESH MEATS</b>					
Beef (Cow/Goat Meat)	1.5%	20.6%	33.8%	25.0%	19.1%
Chicken	2.9%	16.2%	35.2%	27.9%	16.4%
Insects	5.9%	16.2%	14.7%	26.5%	35.3%
<b>EGGS</b>					
Chicken Eggs	1.5%	26.5%	30.9%	22.1%	19.1%
<b>FISH AND SEAFOOD</b>					
Fish	1.5%	26.5%	30.9%	22.1%	19.1%
<b>LEGUMES, NUTS AND SEEDS</b>					
Beans	16.2%	35.3%	7.4%	13.2%	27.9%
Black beans	0%	22.1%	8.8%	29.4%	39.7%
Lentils	0%	13.2%	20.6%	23.5%	42.6%
Green grams	2.9%	23.5%	26.5%	25.0%	22.1%
Dried peas	1.5%	13.5%	26.5%	17.6%	41.2%
Soya beans	0%	11.8%	16.2%	27.9%	44.1%
Groundnuts	2.9%	14.7%	19.1%	38.2%	25.0%
<b>MILK AND MILK PRODUCTS</b>					
Fresh milk	16.2%	20.6%	20.6%	25.0%	14.7%
Sour	7.4%	14.7%	25.0%	23.5%	29.4%
Yoghurt	8.8%	13.2%	20.6%	30.9%	26.5%
<b>OILS AND FATS</b>					
Margarine	4.4%	16.2%	19.1%	20.6%	39.7%
Butter	1.5%	11.8%	20.6%	27.9%	38.2%
Cooking fat	14.7%	7.4%	16.2%	11.8%	50.0%
Cooking oil	57.4%	4.4%	8.8%	16.2%	13.2%
<b>SWEETS</b>					
Honey	4.4%	4.4%	13.2%	39.7%	38.2%
Table sugar	79.4%	1.5%	4.4%	5.9%	8.8%
Syrup	1.5%	5.9%	10.3%	8.8%	73.5%
Jellies	2.9%	1.5%	4.4%	4.4%	86.8%

On average, half of the participants consume different types of sweets in their

diets. The commonly used sweets in this research were table sugar (91.8%), with



79.4% consuming on a daily basis. The use of honey and jam was reported among 61.8% and 73.5% of participants respectively, syrup and jellies were the least popular sugars used, 26.5% and 13.2% respectively.

### Nutrition Status of PLWHA

The Body mass index (BMI) was used to determine the nutrition status of the participants. The standard cut-offs were used: <18.5 kg/m<sup>2</sup> is underweight, 18.5-24.9 kg/m<sup>2</sup> is normal, 25.0 – 29.9kg/m<sup>2</sup> is considered overweight, and greater than or equals to 30.0 is considered as obese. Out of the 68 samples analyzed 7.4% of the PLWHA visiting KTRH CCC were undernourished, while the majority 52.9% had normal weight and 39.7% were overweight and obese(Fig.2).

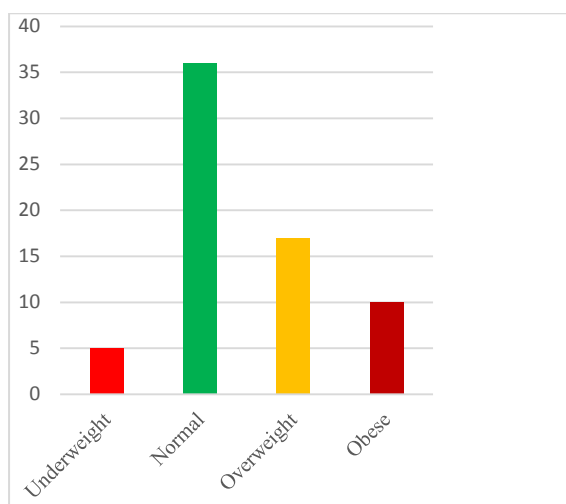


Fig 2: Nutrition Status by interpretation of the Body Mass Index

## DISCUSSION

Poor nutritional and dietary practices play a key role in the rapid progression of HIV. These aspects play an important role to determine the quality of life among PLHIV. <sup>8</sup> The present study found that only two thirds (68.8%) of the respondents consumed at least three meals in a day, with the rest consuming two meals or less a day. This poses a lower dietary intake that matches the increased nutrient demands for PLWHA. This finding was similar to studies conducted in the district of Kerala, India<sup>1</sup>, Eastern Ethiopia<sup>5</sup>. However, a study

conducted in Ghana<sup>9</sup> had a higher proportion of respondents consuming three or more meals in a day.

The finding of this study revealed that cereal and cereal products food group was predominantly consumed by the participants, with an average daily and consumption of 16.4% and 21.6% respectively. *Ugali* from the maize meal was the most consumed by 79.5% of the respondents daily. This finding is in agreement with a study in Ghana<sup>9</sup> where maize meal was the most frequently consumed cereal/cereal products on a daily basis and higher than a study conducted in Kibera, Kenya (62.5%).<sup>2</sup> Bread and *Mandazi* were also more frequently consumed foods on a daily basis in the cereal food group by 22.1% and 20.6% of the respondents. The finding is similar to the study in Kibera (26.6%),<sup>2</sup> but it was lower than the study conducted in Ghana (56.4%).<sup>9</sup>

Dark green leafy vegetables on average were consumed daily by 7.6% of the respondents and 24.9% weekly. This finding was lower than a study in Narok 11.2%, 10.0% weekly.<sup>6</sup> Kales were the most frequently consumed vegetables, with 33.8% consumed it daily and 41.2% consumed it weekly. More than a third of the participants consumed indigenous green leafy vegetables on a weekly basis, with the nightshade leaves (*managu*) being the most frequently consumed by 51.4% weekly, spider plant leaves 35.3%, cowpea leaves 29.4%, pumpkin leaves 30.9%, and amaranthus leaves 42.3%. This finding is in line with a study conducted by in urban and peri-urban environs of Nairobi, Kenya.<sup>10</sup>

This study revealed that 35% of the participants consumed fruits on a weekly basis, of which 10% of them consumed fruits on a daily basis. The proportion of consuming fruits is higher than a study in Narok with 3.4% consumed fruits daily and 20.9% weekly.<sup>6</sup> However, the present study finding is lower compared to a study conducted in Kibera<sup>2</sup> with 69.2% reported to consume fruits weekly.<sup>2</sup> The most

frequently consumed fruit in this study were avocado, banana, oranges, and pawpaw by 63.3%, 63.2%, 45.6%, and 39.8% respectively. This finding is consistent with studies in Ghana<sup>9</sup> and Narok<sup>6</sup> where oranges, banana, pawpaw was frequently consumed fruits on a daily basis. Organ meat, flesh meats, legume, nuts and seeds, and sweets were less consumed in the study population.

According to WHO criteria, adults with a BMI less than 18.5kg/m<sup>2</sup> indicates undernutrition and high risk of illness; a BMI greater than 25kg/m<sup>2</sup> indicates the risk of overweight and a BMI greater than 30kg/m<sup>2</sup> indicates obesity with an increased risk of type 2 diabetes, hypertension, and cardiovascular disease. The prevalence of undernutrition in this study was 7.4%, overweight was 25.0% and obese was 14.7%. This finding was similar to a study in Kibera with a prevalence of 6.7% and lower than reported in Nigeria (2.8%).<sup>11</sup> However, this finding was found to be lower in comparison with other communities in Kenya and abroad. The prevalence of undernutrition in Kerala,<sup>1</sup> and Maharashtra,<sup>12</sup> both in India, was 24% and 30% respectively, while Narok – Kenya,<sup>6</sup> Ghana,<sup>9</sup> Nepal,<sup>13</sup> and Tanzania,<sup>14</sup> reported a prevalence of 29.5%, 30.9%, 19.9%, and 27.7% respectively.

The prevalence of overweight in the study area was similar to the finding in Nigeria (30%). However, it was higher than the studies in Kerala,<sup>1</sup> Kibera,<sup>2</sup> Narok,<sup>6</sup> Ghana,<sup>9</sup> Maharashtra,<sup>12</sup> Nepal,<sup>13</sup> and Tanzania<sup>14</sup> reported a prevalence of 10%, 9.2%, 10.5%, 18%, 9.7%, and 15.3% respectively.

The prevalence of obesity in this study was found to be the highest in comparison to findings in Kerala,<sup>1</sup> Nigeria,<sup>11</sup> and Maharashtra<sup>12</sup> that reported a prevalence of 2%, 14.4%, and 3% respectively. Studied in Narok<sup>6</sup>, Ghana<sup>9</sup>, Nepal<sup>13</sup>, and Tanzania<sup>14</sup> reported no prevalence of obesity in their study areas. The differences in the nutrition status could be attributed to agricultural productivity,

socio-economic and cultural differences in the study areas.

Although this survey contributes to current information in the study area, it is not free from limitations. The cross-sectional design used cannot establish the temporal relationships between exposure and nutritional outcomes. The study design does not represent seasonal variations. Self-reported data was prone to recall bias and social desirability bias. This study is also not free from measurement errors in the collection of anthropometric data although instrument calibration and pretest were conducted to minimize bias.

## CONCLUSION

Our findings reveal low consumption of diversified diets on a daily or weekly basis in two-thirds of the participants. Their diets were predominantly based on high consumption of cereals, eggs, fruits, dark green leafy vegetables, dairy products and low consumption of legumes, organ meats, and flesh meats. The nutritional status of the study population could be a reflection of the nutritional transition, predisposing PLWHA to cardio-metabolic risk factors. These results highlight the need to strengthen community nutrition programmes besides nutrition education to improve accessibility and availability of affordable varied, and sustainable healthy diets to better health for PLWHA.

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## Contribution statement:

AV was responsible for the conception, design, analysis, and interpretation of data described in this study. NA supervised, contributed to the concept, design, and interpretation of the data. MW, OA, & KS contributed to the concept, design, and

interpretation of the data. AV collected research data, contributed to discussion and wrote, reviewed and drafted the Manuscript. NA, MW, OA, KS & KB contributed to discussion and reviewed the content of the manuscript for important intellectual content. All authors approved the final version of the manuscript. AV is a guarantor of the study and takes full responsibility for the work as a whole, including the study design, access to data and the decision to submit and publish the manuscript.

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#### **Duality of interest:**

The authors report no conflicts of interest with this work.

#### **Abbreviations:**

**AIDS** - Acquired Immune Deficiency Syndrome

**CCC**: Comprehensive Care Centre

**HIV**: Human Immunodeficiency Virus

**KTRH**: Kisii Teaching and Referral Hospital

**PLWHA**: People Living with HIV/AIDS

**SPSS**: Statistical Package for Social Sciences

**WHO**: World Health Organization

**UNAIDS**: The Joint United Nations Programme on HIV and AIDS

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