ANALYSIS OF DIETARY INTAKE ADEQUACY OF PEOPLE LIVING WITH HIV/AIDS IN RURAL COMMUNITIES OF BENUE STATE, NIGERIA

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ABSTRACT
Human Immunodeficiency Virus (HIV) among rural dwellers depletes quality of agricultural labour and reduces quality of life. Use of Antiretroviral Therapy (ART) has not significantly reduced consequences of infection, as the effort is being compromised by inadequate dietary intake. This study analysed the dietary intake of People Living with HIV/AIDS (PLWHA) in rural communities of Benue State, Nigeria. Data were collected from 190 PLWHA randomly selected from members of two rural support groups with high prevalence of HIV in Benue State using interview schedule. The data were analysed using descriptive statistics, Pearson Product Moment Correlation, and Student t-test at 0.05 significance level. Mean involvement in agriculture was 15.2±10.6 before HIV and reduced to 9.0±8.2 after HIV infection. Extent of involvement in agriculture significantly reduced pre and post HIV infection in Benue State (t=10.2). Diet diversity score was low among 64.7% of the PLWHA, with a mean of (4.1±1.3) and diet was adjudged severely inadequate. However, change in level of involvement in agriculture had significant correlation with dietary intake (r=0.22). The study concluded that dietary intake of PLWHA in Benue State was inadequate, thus there is need for extension workers to be more pro-active in combating the current challenge of HIV/AIDS among rural households in order to improve food security.
Keywords: People Living with HIV/AIDS, diet diversity, dietary intake

INTRODUCTION

Agricultural productivity anchors on the factors of production: land, capital, labour and entrepreneur (the farmer). Therefore, land, supply of agricultural inputs, loans, credits and subsidies in agriculture may contribute to achieving optimal productivity. The functionality of these factors, however, rests on the coordination of the entrepreneur, the majority of who are rural dwellers. Such coordination is influenced by their state of health.

The impact of HIV/AIDS on agriculture is enormous: labour shortage, reduction in farm size, substitution of cash crops for crops which require less labour and strength to produce, poor household nutrition, food insecurity, economic losses among others. According to USDA (2001), for every 1% decrease in the supply of labour, production will decrease by 0.3%. The World Health Organization (WHO) also estimated that local losses in agricultural productivity from AIDS at the households or village level range from 10 to 15% in about ten sub-Saharan African countries, including Nigeria. Therefore, HIV goes beyond being a health issue but has also become more of a social and economic issue.

There have been several interventions at local government and state levels in Nigeria by various stakeholders such as the federal government, donor agencies, NGOs and others to obviate and arrest the scourge of HIV/AIDS through provision of Anti-Retroviral Drugs, clinical care and support, yet, the prevalence rate remains high and death toll from HIV/AIDS escalates at an alarming rate particularly in the rural areas (FMH, 2014). According to UNAIDS (2015), approximately 3.5 million people are living with HIV/AIDS with an estimate of 2.9 million who do not have access to Anti Retroviral Therapy (ART). In 2014, out of 1.5 million PLWHA who were eligible for ART, only 747,382 were enrolled. At the end of 2015, approximately 250,000 new infections occurred and an estimate of 180,000 AIDS related death were reported. Unfortunately, HIV infection occurs mostly among those in the sexually active age, ranging from 15-49 years, as the most common means of transmission in Nigeria is heterosexual activities (FMH, 2010). Those who fall within this age range are considered the most active, vibrant and most productive within any given community.

The statistics above indicates that urgent attention needs to be paid to support PLWHA and arrest the high rate of mortality among carriers of the virus. To achieve this, various studies (Castleman *et al* (2004) and FANTA (2004)) have shown that adequate dietary intake along side ART is the key. This is because adequate dietary intake helps keep the immune system strong, enabling one to better fight the disease and help the body of PLWHA process the many medications taken (Nanziri, 2008). HIV/AIDS attacks the immune system making the body susceptible to opportunistic infections like fever, diarrhoea, tuberculosis, pneumonia, sores and blisters and has no cure. Therefore, efforts made by government and other concerned organisations must be augmented by the infected individuals through proper and adequate dietary intake. This is because poor nutritional intake for PLWHA has dire consequences for an already compromised immune system. Adequate dietary intake may help to delay rapid progression from HIV to AIDS and reduce high mortality as a result of HIV/AIDS.

According to World Bank (2007), adequate dietary intake cannot cure HIV infection,

but it is a panacea to maintain the immune system, prevent opportunistic infections, sustain physical activity and achieve optimal quality of life. In this way, infected people can live longer and more meaningful life despite the virus. However, Nanziri (2008) noted that the role played by good nutrition and adequate dietary intake as a major component of managing the health of PLWHA is poorly emphasised in most HIV interventions.

The understanding and practice of adequate dietary intake among PLWHA is, therefore, an important step in the direction towards reducing the mortality rate from the pandemic and the consequent effect on agriculture and national economy as a whole. It is against this background that this study seeks to provide answers to the following research questions:

The general objective of the study was to analyse the dietary intake of people living with HIV/AIDS in rural communities of Benue State, Nigeria.

The specific objectives of the study are to:

1. describe the personal characteristics of PLWHA in rural communities of Benue State;
2. examine change in level of involvement in agricultural activities among respondents;
3. access the respondents' level of adequacy of dietary intake.

A null hypothesis was tested in the study:

$H_0$1: There is no significant relationship between respondents' change in level of involvement and the level of adequacy of their dietary intake.

METHODOLOGY

The study was conducted in Benue State of Nigeria. It lies at the middle-belt region of Nigeria with a population of 4,253,641(NPC, 2006). The state is administratively divided into three agricultural zones (A, B and C) and each zone has a government owned hospital where Anti Retroviral Therapy were administered to PLWHA. The major ethnic groups in Benue State are Tiv and Idoma. The present Benue State is endowed with agricultural produce such as yam, cassava, potatoes, rice, millet, guinea corn, groundnut, maize, beniseed, sesame, soya beans among others and a vast range of fruits and vegetables which all earned the State the slogan 'food basket of the nation'.

A multi stage sampling procedure was used to select respondents for this study. The first stage was the purposively selection of two LGAs (Okpokwu and Tarka LGAs) to capture rural communities with high HIV prevalence in Benue State (FMH, 2014). In stage two, all HIV/AIDS support groups within the two LGAs were sampled comprising of one support group each in Okpokwu and Tarka of Benue State. Members of the support group were those who have tested and found to be infected with HIV. In stage three, fifty percent of registered members in each group were selected using simple random sampling technique to get a total sample size of 216 respondents out of which 190 questionnaires were returned and used for analysis giving 88.4% response rate. Interview schedule was used to collect quantitative data for the study.

Respondents' level of involvement in agricultural activities were categorised into pre-planting operations, planting operations, post planting operations, marketing of produce, processing of produce, animal husbandry and fishery. The level of involvement for pre and post HIV infections were measured using a three point scale of (a) Often (b) Occasionally and (c) Never. Often was scored two, Occasionally, one and Never, zero and the mean computed. Based on the mean Pre HIV infection (12.7) and Post HIV infection (7.0) respondents were categorised into low and high level of involvement in agriculture; Pre HIV infection low (0-13), High (14-34), Post HIV infection low (0-7), High (8-30)

Level of adequacy of dietary intake data were collected from respondents using the Individual Dietary Diversity Score adapted from FANTA scale (2007). Respondents were asked to tick Yes or No to the consumption of any of the options of 12 food groups given which are: carbohydrates, tubers, dark green leafy vegetables, fruits, meat, eggs, sea foods, food made from beans, yoghurt, milk or milk products, food made from oil, fat or butter, sugar or honey and beverages (alcoholic and non-alcoholic), using a 24 hours diet recall method. A 'yes' response was scored one and a 'no' response zero. The highest score was 12 while the lowest score was 0. The higher the score, the more diversified the diet and the more adequate. The scores were grouped into terciles (Ruel, 2003) as Low (0-4) (severely inadequate), average (5-8) (inadequate) and high (9-12) adequate dietary intake. Adequacy of respondents' dietary intake was judged based on their position on the scale.

Descriptive and inferential statistics were used to analyze the data. Descriptive statistics used include; mean, frequency and percentage distribution while inferential statistics used were Pearson Product Moment Correlation and Student's t-test.

RESULTS AND DISCUSSIONS

Respondents' personal characteristics - Age distribution of respondents as presented on Table 1 showed that in Benue, 55.3% were within the age range of 21-40 years with a mean age of 37.5±11.9 years. This suggests that the majority of the respondents were in their economically active and productive years. This is in agreement with Kormawa (2005) who opined that HIV/AIDS

affects the most active and productive segment of the rural society. The prevalence of HIV/AIDS within this age group is an indication that agricultural productivity and inevitably food security may be threatened, thereby putting families increasingly at risk of food unavailability and poor nutritional intake in the study area.

More female (58.9%) were infected with HIV than the male. This is in agreement with UNAIDS (2012) report which stated that HIV/AIDS prevalence rate were generally higher among female than male and that girls and women showed higher cum early vulnerability and infections than boys and men. These women account for 70% of the agricultural labour force and 80% of food production in Nigeria (Olomola, 2007) in addition to preparing meals consumed in homes falls disproportionately on women. This is a dangerous trend in that the more women infected with HIV/AIDS implies threat to food security and poor nutritional intake by families.

Half (51.1%) of the respondents were married. According to UNAIDS (2012), the bulk of new infections occur in persons who are not engaging in high risk sex, a sub population that includes cohabiting or married partners. Infections acquired as a result of the previous or present high risk behaviours or relationship by one sex partner is easily transmitted to the unsuspecting partner. This is probably because cohabiting or married partners are usually unsuspecting of their sexual partners and often consider them free from Sexually Transmitted Infections (STIs) and so use of condom is low. HIV infection within a family distorts family structure, reduces quality and quantity of agricultural labour. As a result of this, food production may reduce and food security becomes threatened.

The majority (53.2%) had an household size of 5-8persons with mean of 7.0±2.7 members. Similarly the findings of Adebayo (2012) indicated the average household size for most families to be between 5-8 members. The household is fairly large which may result in reduced food availability, food intake and poor nutritional status.

The highest educational level attained by (46.6%) of the respondents was secondary school education. This is consistent with the findings of Mofolorusho, Fatiregun and Osagbemi (2013) that most rural dwellers have at least secondary school education.

Education plays a major role in information communication as it is necessary for proper processing of information as observed by Oladeji and Oyesola (2000). Therefore, knowledge on dietary intake is expected to be high, resulting in a positive attitude towards adequate dietary intake.

Table 1: Percentage distribution of respondents according to personal characteristics

Variable	Percent	Mean±SD
Age (years)		
≤20	5.8	
21-30	27.9	
31-40	27.4	
41-50	24.7	
51-60	10.5	
61-70	3.7	37.5±11.9
Sex		
Female	41.1	
Male	58.9	
Marital status		
Single	23.7	
Married	51.1	
Divorced	8.4	
Widowed	16.8	
Household size		
1-4	26.8	
5-8	53.2	
9-12	18.4	
>12	1.6	6.8±2.7
Educational attainment		
Non formal education	5.3	
No formal education	23.8	
Primary education	12.7	
Secondary education	46.6	
Tertiary education	11.6	

Involvement in agricultural activities pre and post HIV infection

Table 2 shows the respondents' level of involvement in agriculture before having the knowledge of being HIV infected and their level of involvement now that they live with the virus. Mean involvement of respondents in agricultural activities before HIV infection was; land clearing (1.05), removing stumps (1.00), planting on the field (0.98) and harvesting of crops (1.00). Currently while living with HIV, (0.61) cleared their land, (0.62) removed stumps,(0.59) planted on the field and (0.59) harvested their crops. In his comparative study on the productivity level of women in HIV/AIDS prevalent and non-prevalent areas of Benue state, Ekele (2003) revealed a drastic reduction in the farm size and production level between the two groups. If left unchecked, the impact of HIV/AIDS on agriculture would be full blown where coping mechanisms are likely to fail and food security severely threatened.

From the results, it was also observed that majority (7.3) of the respondents engaged in crop farming alone. Only a few explored other forms of agriculture such as animal breeding before (0.61) and after (0.48) HIV infection. Mean involvement in fishery was (0.03) before HIV and (0.02) after. It is important that extension workers help explore these other aspects of agriculture (animal rearing and fish farming) which are less laborious than crop farming and can also supply PLWHA households with the much needed protein for body building.

Table 2 Mean level of involvement in agricultural activities pre and post HIV infection

Variable	Pre infection	Post infection
Land clearing	1.05	0.61
Burning of cleared land	1.03	0.61
Parking of unburnt materials	1.01	0.61
Stumping	1.00	0.62
Seed selection	1.00	0.58
Planting in the field	0.98	0.59
Weeding	1.00	0.61
Thinning	1.00	0.58
Staking	0.98	0.58
Fertiliser application	1.00	0.59
Harvesting	1.00	0.59
Storage	0.97	0.65
Marketing of crop produce	0.09	0.07
Processing of crop produce	0.03	0.01
Breeding	0.61	0.48
Feeding animals	0.59	0.44
Marketing of animal produce	0.57	0.47
Processing of animal produce	0.56	0.56
Stocking of fish	0.03	0.02
Feeding	0.04	0.06
Marketing of fish produce	0.10	0.08
Harvesting of fish	0.08	0.03
Processing of fish	0.43	0.02

Categorisation of respondents' level of involvement in agricultural activities pre and post HIV infection

Table 3 reveals that, 50.0% of the respondents had both high and low level of involvement in agricultural activities before they were infected HIV. However, 56.3% had high level of involvement in agricultural activities after HIV infection as against 43.7% that had low level of involvement. .

Thus many of the respondents were still actively involved in agricultural activities, even with their HIV status. This is so because with proper management, PLWHA can still carry on their daily activities as HIV does not necessarily mean a death sentence. Although it may not prevent involvement in agriculture, it can cause loss of man days, reduce their productivity and quality of farm produce. Therefore with proper management, using ART and adequate dietary intake, PLWHA can live normal lives for a long period of time (World Bank, 2007).

Table 3: Categorisation of respondents' level of involvement in agriculture pre and post HIV infection

Scores	Pre HIV infection	Scores	Post HIV infection
	%		%
Low	50.0	Low	56.3
High	50.0	High	43.7
Mean±SD	15.1±10.6	Mean±SD	9.0±8.2

Test of difference in the mean level of involvement of agricultural activities pre and post HIV infection

A significant (p≤0.05) difference was observed in respondents' involvement in agricultural activities pre (Mean=15.2) and post (Mean=9.0) HIV infection. This implies that food and nutrition security would be affected particularly at household level. This may cause a lowering of the body immune system due to inadequate dietary intake (Koethe and John, 2010). AIDS prolongs and deepens poverty, making it harder to escape this inevitable outcome if not properly managed.

Table 4: Difference in involvement of agricultural activities pre and post HIV infection

Variable	Mean	Std. Deviation	Mean diff.	t-value
Pre	15.2	10.6	6.2	10.2
Post	9.0	8.2		

*Significant level p≤0.05

Respondents' dietary intake using 24 hours diet recall

The distribution of respondents' 24 hours diet recall as presented on Table 6 reveal that the majority (55.3%) of the respondents ate cereals, 80.0% ate tubers while dark green leafy vegetables and food made from beans were consumed by (54.2%) and (55.3%) of the respondents respectively. Food groups least consumed were food made from yoghurt, milk and milk products (4.2%) and eggs (8.9%). This result is consistent with the report of Sanusi (2010) on food group consumption pattern in Nigeria which reveals that consumption of cereals and tubers were consumed by a high percentage of people, while the consumption of milk and milk products and eggs were consumed by a few. Diets that are predominantly starchy are usually low in micronutrients which is needed to strengthen the body immune system.

This situation presents the urgent need for extension agents and stakeholders to promote the cultivation and consumption of food that give essential nutrients (fruits and vegetables) required for optimal health and the practice of animal husbandry in order to provide protein from animal sources. Apart from the high nutritive value of vegetables, they can also serve as means of providing additional income for households who produce them (Abugu *et al*, 2013)

Table 6: Percentage distribution of respondents based on 24 hours diet recall dietary intake

Food group	**%**
Cereals (millet, wheat, sorghum, maize, bread, others)	55.3
Tubers (potatoes, yam, cassava, cocoyams, others)	80.0
Dark green leafy vegetables (Ugu, green leaf, waterleaf, bitter leaf, okro, others)	54.2
Fruits (mangoes, oranges, paw-paw, guava, others)	41.6
Meat (beef, pork, rabbit, chicken, offal, others	28.4
Egg	8.9
Sea foods (Fresh or dried fish, cray fish, shell fish)	38.9
Any food from beans	55.3
Any food from yoghurt, milk, other milk products	4.2
Any from made with oil. fat or butter	9.5
Sugar or honey	11.1
Tea, coffee, cocoa, herbal drink	6.3

Categorisation of respondents by dietary diversity score

Dietary diversity measured by the number of food groups consumed has been shown to be a potential proxy indicator of adequacy of nutrients (Torheim *et al*, 2004).

The Individual Diet Diversity Score (IDDS) of the respondents as indicated on Table 7 shows that 64.7% of the respondents had low IDDS of food group category, while only 0.5% had high IDDS of food group category. The mean score was 4.1 for 12 food groups. This is an indication that respondents food intake is grossly inadequate.

According to Azadbakht, Mirmiran and Azizi (2006), diet diversity improves nutritional status. Therefore eating variety of foods from different groups is usually recommended.

Although food intake among people who reside in rural areas is culturally influenced as opined by Wahlquist (2005), this result negates the researcher's submission that it is associated with a more diversified diet. The need to ensure that PLWHA have better access to good nutrition and proper education on adequate dietary intake becomes apparent.

Table 7: Categorisation of respondents by Dietary Diversity Score

IDDS	%	Mean±SD
Low	64.7	
Average	34.7	4.1±1.3
High	0.5	

There is no significant relationship between change in level of involvement in agriculture and dietary intake adequacy of PLWHA in Benue State.

There is a significant correlation ($r=0.22$; $p>0.02$) between change in level of involvement in agriculture and dietary intake adequacy. It implies that high or low level of involvement in agriculture would affect dietary intake. Benue state is largely an agrarian community with farming as the main form of livelihood and source of income. Therefore, the extent to which agricultural activities are engaged in would determine quantity and quality of food intake. This is corroborated by the findings of Ekele (2003) who in his study found that productivity level of farmers in HIV prevalent areas reduced when compared to productivity level of farmers in non HIV prevalent areas in Benue State.

CONCLUSION AND RECOMMENDATION

The dietary intake of most people living with HIV/AIDS in rural communities of Benue State accessed through the 24 hour diet recall and Diet Diversity Score (IDDS) based on 12 food groups was low and severely inadequate. It is of paramount importance that extension agents and other stakeholders work closely with local farmers especially women farmers, to identify locally sustainable and appropriate ways to promote home gardens. This is to ensure that foods eaten are varied, nutritious, readily available and accessible at all times. This could also be a source of additional income to the households.

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