

## Food Insecurity and Associated Factors among People Living with HIV Attending ART Clinic in Fitcha Zonal Hospital, Ethiopia

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### Abstract

**Back ground-** The bi-directional linkages of HIV/AIDS and Food insecurity are not well documented. HIV/AIDS deepens food insecurity; affects the nutritional status of PLHIV leading to weight loss and wasting. Nutrition is the pivotal interface between food security and health security. The aim of this study was to determine the level of food insecurity and associated factors among People living with HIV in North Ethiopia Oromia Region Fitcha Zonal Hospital

**Methods:** Facility based cross-sectional study design was employed on 390 PLHIV attending Fitcha Hospital ART clinic from February 15 to March 15/ 2012. The study participants were selected using simple random sampling technique. A pre- tested semi-structured questionnaire was used to collect data and analyzed using SPSS Version 16.0. Both bivariate and multivariate logistic regressions were used to identify associated factors. All statistical tests at  $P < 0.05$  were considered as significance and triangulated with qualitative result.

**Result:** The prevalence of food insecurity among PLHIV in Fitcha Hospital was 341 (87.4%).

This study identified that factors found to be associated with food insecurity among PLHIV were:— monthly income  $>200$  birr [AOR=0.999, 95%CI:0.99- 1.00], no education/illiterate [AOR = 4.18, 95% CI: 1.73- 10.09], Read & write [AOR = 10.54, 95% CI: 1.88-58.99], 1st Cycle (grade 1-6) [AOR = 7.02, 95% CI: 2.46-20.07], Second cycle (grade 7-8) [AOR = 3.67, 95% CI: 1.19 -11.30], not involved in agriculture practices [AOR = 2.22, 95% CI: 1.13-4.36], major depression [AOR = 4.28, 95% CI: 1.54-11.88] and meal frequency less than three times [AOR = 4.54, 95% CI: 2.10 -9.79] were some of the factors significantly associated with food insecurity among PLHIV.

**Conclusion:** The level of food insecurity among PLHIV attending ART at Fitcha Hospital is very high (87.4%). Monthly income, meal frequency per day, educational status, not involved in agriculture practices and psychological depression were demonstrated significantly associated with food insecurity among PLHIVs and these factors should be emphatically considered during PLHIV's nutritional program development. Therefore, Policy makers and Ministry of Health need to consider and plan for may increases numbers of food insecured PLHIV among these populations and would be better to give greater emphases to address PLHIV's food rations' in more comprehensive manner with ART treatments.

**Keywords:** Food insecurity, People living with HIV, Fitcha

### Background

The 2012 edition described improvements made by the FAO to the prevalence of undernourishment (PoU) indicator that is used to measure rates of food insecurity.

Food insecurity in Ethiopia derives directly from dependence on undiversified livelihoods based on low-input, low-output rainfed agriculture (1). Ethiopian farmers do not produce enough food even in good rainfall years to meet consumption requirements. Food insecurity incorporates low food intake, variable access to food, and vulnerability – a livelihood strategy that generates adequate food in good times but is not resilient against shocks. These outcomes correspond broadly to chronic, cyclical and transitory food insecurity, and all are endemic in Ethiopia (1).

Nutrition is the pivotal interface between food security and health security. An individual's susceptibility to any disease depends on the strength of the immune system, which among other factors is affected by nutrition, stress, and the presence of other infections and parasites. The risk of infection with HIV is high in low income countries (2).

Good nutrition can boost the immune system and energy levels. It can help maintain body weight and support the effective action of drug treatments. A person who is well nourished is stronger and better able to fight infections. This is particularly important for people living with HIV. In addition, good nutrition improves the quality of life and prolongs the life of PLHIV (3). The bi-directional linkages of HIV/AIDS and food insecurity not well documented. HIV/AIDS deepens food insecurity; affects the nutritional status of PLHIV leading to weight loss and wasting. On the other hand Food insecurity may lead to increased high-risk behaviors, for example, labour migration or engaging in transactional sex that increases the likelihood of infection, malnutrition reduces resistance to infections; increases vulnerability and speeds up the progression to AIDS and eventual death (3,4). HIV/AIDS affects the economic well-being of families, businesses, and societies in many

ways. When people become ill and die, society loses not only those people but also their productive potential. They no longer hold jobs, manufacture goods, provide services, or support their families (5).

The effects of undernutrition on the immune system are well known and include decreases in CD4 T-cells, suppression of delayed hypersensitivity, and abnormal B-cell responses. Three to four times the immune suppression caused by protein-energy malnutrition is similar in many ways to the effects of HIV infection (6). The consequences of household food insecurity are as many as its causes, which require different responses. Poor households are the most food insecure households and they are highly prone to shocks. In rural areas, households who do not have land or oxen, or are female-headed, or who are comprised of the elderly or newly established settlers are food insecure households. In many instances unemployed people, single-parent-headed households, elderly people living alone, and destitute and homeless people are food insecure in urban Ethiopia (2).

AIDS has a direct impact on rates of economic growth in the most affected developing (especially SSA) and developed countries(9). It is likely that the epidemic will contribute to worsening widespread food insecurity, and conversely, food insecurity will increase vulnerability of the population to HIV infection(4,10). Chronic food insecurity in Ethiopia occurs when there is a constant failure of food acquisition while transitory food insecurity refers to a temporary failure of acquisition caused by drought, war, short-term variability in food prices, production, and incomes. It was estimated in 2004 that up to 60 percent of the rural and 40 percent of the urban population faces risks of food insecurity. The number of relief dependent population has increased from 4 million in 1995 to 10 million in 2000, which indicate that famine has become more prevalent (2). If adequate measures are not taken, the catastrophic nature of HIV/AIDS will ground down the economic activities of countries. Because, the global number of People Living with HIV/AIDS (PLHIV) is seriously increasing - from the earlier 8 million in 1990 to 33 million in 2007 which is show four times increased within 17 years(1). But the extent of these food insecurity and associated factors was not well understood in Ethiopia in genera and particular in Fitcha hospital. Hence this study was conducted to identify level of food insecurity and associated factors among PLHIV attending ART clinics of Fitcha Hospital.

## **Methods and materials**

### **Study setting**

The study was conducted from February 15 to March 15/2012, in Fitcha Hospital ART clinics which found in Fitcha town, North shoa Zone, Oromiya Regional State in Northern part of Ethiopia and 115 Kilo meters North of Addis Ababa. According to the national population and housing census of 2007/08 of Ethiopia, the projected population of the zone for 2013 was estimated to be 1,388,617 and from those 6, 951, 87(50.06%) were males. The area has 2 hospitals, 48 health centers and 268 functioning health posts with estimated potential health service coverage of 91.6% (35, 36). During study period the total number of PLHIV attend ART units' at Fitcha Zonal Hospital (FZH) was 6871 and of whom 2,518 of them are on ART and the rest 4,353 were on pre-ART service.

### **Study design**

A facility based cross-sectional study design with both quantitative and qualitative data collection methods was conducted in ART clinic of Fitcha Hospital. The study inclusion criteria were having attended for at least three months, availability of HIV sero-status results, HIV positive diagnosis and age 18 years and above for both men and women.

### **Sampling procedure and sample size determination**

For the quantitative study sample size was determined by using single population proportion formula by considering 50% proportion of food insecurity among PLHIV with 95% confidence interval and 5% marginal error. Since the total numbers of patients enrolled to ART clinic at Fitcha Hospital were 6871, Population correction formula was used. By considering 10% non-response rate, the final sample size was 401

A list of all adult women and men age 18 years and above who are living with HIV were selected and entered into computer SPSS window 16.0 version from HIMS data base. Computer generated simple random sampling technique was employed to select study respondents by using their Pre-ART card number. During the one -month study period, 390 PLHIVs were recruited into the study by randomly selection.

For qualitative study; all mother support group (four from four mothers) and all peer educators (six from six peer educators) were recruited purposively based on their duration of follow up greater than 10 years and they are expert patient of PLHIV who are working in the hospital. Qualitative data was collected by ART focal person through in-depth interview by using semi-structured interview guide and conducted in separate room. Voice recorder and field-notes were used to capture the information obtained from the in-depth interview.

### Data collection procedures

Data were collected by face to face interview by using structured, pre-tested Amharic and Afan Oromo version questionnaire. The questionnaires were initially prepared in English and translated to Afan Oromo and Amharic and back to English by language experts and researchers to keep the consistency of the questionnaires. Two well trained diploma nurses who are working in the ART clinic had collected data and one BSC Nurse had supervised during data collection period. Data collectors had cross checked Pre-ART card numbers of all clients who came to ART clinic with sampled card numbers daily. The filled questionnaires were checked for consistencies and completeness daily by supervisor and principal investigators on the spot. Pre-test of the questionnaire were done on 5% of the sample of PLHIV in Kuyu Hospital which is nearby to Fitcha town, to identify any ambiguity, consistency and acceptability of questionnaire, and then necessary corrections were made before the actual data collection.

### Measurements of the Variables

The Cronbach alpha was calculated which was 0.71 for food insecurity item and 0.85 for depression assessment scales.

*Household Food Insecurity Access Scale* (HFIAS) - continuous measure of the degree of food insecurity (access) in the household in the previous month

*Household Dietary Diversity Scale* (HDDS) - measures the number of different food groups consumed over a specific reference period (24hrs/48hrs/7days).

*Household Hunger Scale* (HHS)- measures the experience of household food deprivation based on a set of predictable reactions, captured through a survey and summarized in a scale [11, 12, 13]

- 0-2 classified as food secured for *HH respondents*
- 3-5 for *HH respondents* with classified as Food Insecure without hunger (mild).
- 6-8 for *HH respondents* classified as Food Insecure with hunger (moderate).
- 9-10 for *HH respondents* classified as Food Insecure with hunger (severe).

**Depression:** is defined as if the individual answers for 20 depression scale as follow (14).

- Less than 15 score Normal (no depression)
- 15-21 score Mild depression
- Greater than 21 score Major depression

### Operational definition and definition of terms

*Household Food Insecurity Access Scale* (HFIAS) - continuous measure of the degree of food insecurity (access) in the household in the previous month. The 2012 edition described improvements made by the FAO to the prevalence of undernourishment (PoU) indicator that is used to measure rates of food insecurity. Food insecurity considered when the individual (PLHIV) answer >2 to affirmative questions of food insecurity scale that resulting from financial resource constraint.

**Food security:** is enough nutritious and safe food being available and accessible for a healthy and active life by all people at all times. In this paper Food security considered when the individual (PLHIV) give answers (0-2) to affirmative questions of food insecurity scale that resulting from financial resource secure.

**Meal frequency** – is the number of reported daily eating occasions by household members in a household experienced with in a day. This does not include eating occasions by the household members experienced outside home.

**Dietary diversity** – is the number of reported different foods and food groups consumed in a household over a 24-hour period. This does not include food group consumed by the household members outside home.

### Data processing and analysis

After data collection, each questionnaire was checked for completeness and code was given before data entry. Data was entered, sorted, edited and cleaned for missed values. Data were analyzed by using SPSS version 16.0 statistical packages and presented by frequencies and percentages for categorical variables and means and standard deviations for numerical variables. Bivariate analysis was conducted primarily to check the variables which had an association with the dependent variable individually. Variables associated with the dependent variables at p value <0.2 were then entered in to multiple logistic regression for controlling the possible effect of confounders and finally the variables which had significant association with Food insecurity were identified on the basis of adjusted odds ratios (AOR), with 95% CI and p-value (<0.05) to fit into the final regression model. The results were presented using tables, figures and narratives.

To add an in-depth of information on food insecurity that could not be captured by quantitative methods alone. Data captured using tape records was translated word by word into English language and color coded, organized and summarized manually under the main thematic area and presented the result by extracted concepts

from main themes.

### Ethical Consideration

Ethical clearance letter was initially obtained from Jimma University College of Public Health and Medical Sciences Ethical Committee. Then written consent was secured from Fitcha hospital and permission was secured. Verbal informed consent for participation and audio recording of the discussions was obtained from each participant and the collected data were stored in a file, without the name of study participant and password protection of soft copy data and use of key and lock for hard copy data was employed to guarantee confidentiality.

### Result

#### Socio-demographic characteristics

A total of 401 PLHIV on ART were interviewed and 390 consented to participate in the study which gives response rate of 97.3%. Of which 262(67.2%) were females. The mean age of study participants was 35.79(SD±9.27) years and 174(44.6%) of them were between age group of 31-43 years. Ninety five percent 383(95.1%) were Orthodox and 167(42.8%) were married. Concerning educational status, the majority of respondents 130(33.3%) were illiterate followed by first cycle 103(26.4%) and 128(32.8%) were daily laborers and 58(14.9%) were farmers. Only 15% of study participants accessed to food and cloth aids from Community based organization, NGO and church. Majority of study participants 74.6% were from urban and 266(68.2%) were dependent child/children (<18yrs) in the house and 66.9% of them have 1-2 children.

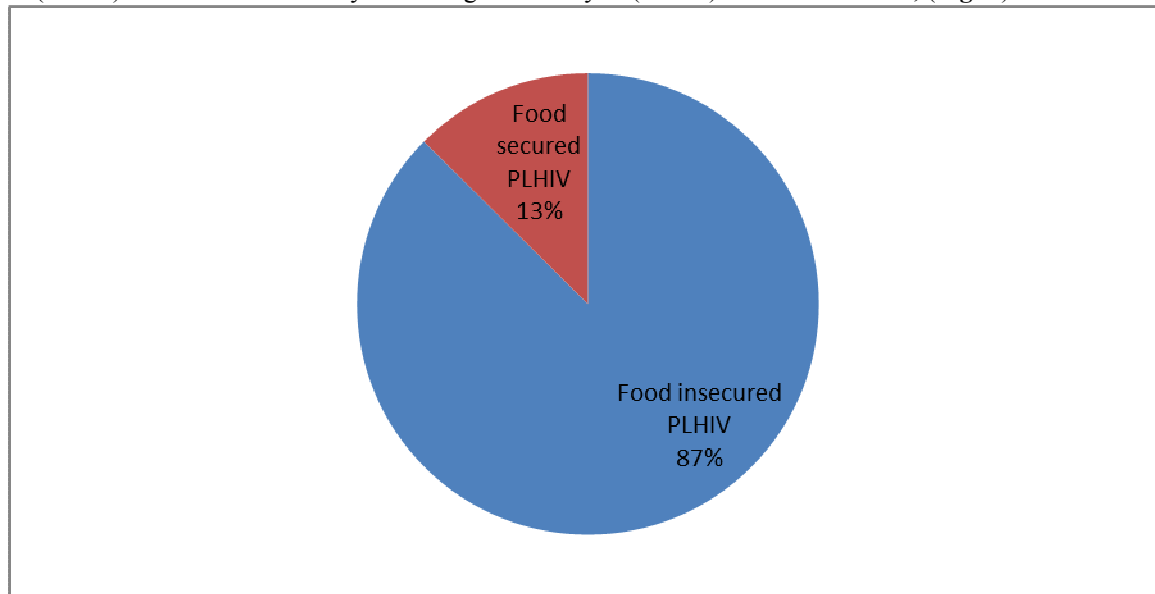
Concerning average monthly income of the study participants showed that 55.1% had monthly income below 200 Birr with the median monthly income of 200 Birr (1USD =18.42 Birr) (**Table 1**).

Table 1: Distributions of PLHIV attending ART clinic by Socio-demographic characteristics in North Ethiopia Fitcha zonal hospital

Variable name	Frequency	Percent
<b>Sex</b>		
Male	128	32.8
Female	262	67.2
<b>Age</b>		
<25	37	9.5
25-34	150	38.5
35-44	138	35.4
>=45	65	16.7
Total	390	100.0
<b>Religion</b>		
Orthodox	371	95.1
Protestant	16	4.1
Muslim	2	0.5
Joba	1	0.3
<b>Total</b>	<b>390</b>	<b>100</b>
<b>Marital status</b>		
Single	43	11
Married	167	42.8
Widowed	79	20.3
Divorced	100	25.6
Cohabiting	1	0.3
<b>Total</b>	<b>390</b>	<b>100</b>
<b>Educational status</b>		
Illiterate	130	33.3
Read & write	35	9
1st cycle (1-6)	103	26.4
Second cycle (7-8)	56	14.4
High school (9-12)	45	11.5
>=12(colleges)	21	5.4
Total	<b>390</b>	<b>100</b>
<b>Gender of household</b>		
Male	202	51.8
Female	188	48.2
Total	390	100
<b>Resident-</b>		
Urban	291	74.6
Rural	99	25.4
Total	390	100

#### Level of food insecurity of household PLHIV

Out of total PLHIVs the majority, 341(87.4%) respondents were food insecure at households' level of which 154(45%) were mild food insecurity with out hunger, 109(32.2%) food insecurity with hunger and 78(22.8%) severe food insecurity with hunger and only 49(12.6%) were food secured, (**Fig: 1**).



**Figure: 1 Level of food insecurity among PLHIV in North Ethiopia, Fitcha hospital**

Regarding the accessibility of PLHIV household to food aid, only 14.9% of total study participants got food aid and nearly 85% of them not supported with food aids. This finding is supported by most of in-depth interview discussants, for instance: – as one 36 years Woman discussant explained that *“the problem of food insecurity mainly concerns of PLHIVs because they did not access to balanced diet and there is immune-compromise as the result vulnerability to the disease increased There is stigma and discrimination in the community so that PLHIV fear to work in the community that again exposed to food insecurity”*

People living with HIV need support. This may be psychological, social, financial and treatment support. Another 39 years old peer-educator man said *“If the government and non government organizations support us with material and money and organize us by Micro enterprising, we can generate our income source and we can help our selves and our families. In addition if there is softytnet (food for work) program in our area, we can participate in it and we reduce the problem of food insecurity...”*

#### **Dietary diversity and meal Frequency**

The study also assessed dietary diversity score of PLHIV which was measured by the total number of food groups that PLHIV (any member of the household in which the PLHIV on ART) consumed during 24 hour prior the survey. The study showed that the study participants consumed five or more food groups in the study period within 24 hours.

The food types frequently consumed during 24 hours at the survey period by the study participants were cereals (78.7%), condiments/coffee/tea (80.5%), vegetable (32.6%), fruit (27.2%) and milk product (6.4%). Fish 3.1% and eggs were the least number of food group consumed by PLHIV study participants. Assessments of meal frequency within 24 hrs indicated that majority of study participants ate break fast (93.6%), lunch (98.2%) and dinner (99.7%). Majority of them consumed meal three times per day 97.2%. This finding is supported by most of in-depth interview discussants, for instance: –as one 33 yrs old man discussant explained: *“I have shortage of food diversity and balanced diet. So, many of the PLHIV did not afford it to buy. This is also another our problem why we did not accessed to balanced diet due to lack of income and income generated activities in the area . Hence that why many of us focus on quantity rather quality and buy the cheapest food with low price that may be contain less nutritional value. The other is reducing number of meal per a day (approximate meal frequency) are the common method we use to over come the shortage of food supply problem.”*

#### **Factors associated with food insecurity among PLHIV, HIV/AIDS related factors**

The modal duration of the study participant since knowing their sero status was 2 years with maximum 15 years. Assessment of disclosure status show that 59.7% to family, 42.4% only to their partner, 35.3% to their relatives, nearly about 35.8% disclosed to other people and 9.5% of the study participant have not disclosed to any one. From the review of PLHIV's records, about 93.8% were on ARV therapy and 6.2% of them were on pre-ART follow up. Morbidity (opportunistic infection) report of the respondents indicated that oral thrush 36.7%, skin

diseases 48.5%, TB 20.1%, diarrhea 24.8%, STI 12.9% ,Nasophagitis 10.6% and 3.2% others were common problem . Close to 69.2% of study participants were in WHO stage one and 19%were in stage three. Education (awareness) is very important for community and PLHIV.

### ***Depression assessment***

Large proportion of the participants (43.3%) had major depression and 30% of the participants had mild depression during the study period. Out of total study participants, only 26.7% of them did not have depression symptom. The mean depression score of participants were 8.2 with the standard deviation of  $\pm 20$ . People living with HIV most of the time depressed because of many reasons 1 disease it self 2 fear of stigma and discrimination 3 food insecurity problem. The qualitative indicated that there was psychological impact among PLHIV subjected to food security problem. This finding is supported by most of in-depth interview discussants, for instance: –as one a 48 years old peer-educator male discussant explained, “There is wariness of how I get enough food supply. On the other hand some of us are bed ridden and did not work with community due to fear of stigma (internalized shame.) This is again more depressed PLHIVs in addition to worries how to feed their family and themself with this limited resource.”

### ***Practice of Agriculture***

From the total of study participants only 99(25.4%) practiced agriculture of this 81(20.8%) practice on their own plot land and 18(4.2%) of them practice on rented plot.

The commonly cultivated products were teff (16.4%), burley (15.6%), wheat (17.2%), bean (16.4%) and pea (7.4%) were major one. About 35% of the study participants have livestock of which cattle (23.1%), sheep (18.7 %) and chicken (7.7%) were the most common they used their product as food.

Multiple logistic regression models were used to control for any potential confounders that determine food insecurity status. (Table 2 below) factors found significantly predictive of

Food insecurity for PLHIVs were: – monthly income  $>200$  birr [AOR=0.999, 95%CI: 0.99- 1.00)] as the income of the individual increase food insecurity decrease (B=-0.001, P=0.035).

PLHIVs who have no formal education (illiterates) were 4.2times (AOR: 4.2, 95%CI: 1.734-10.093), read and write were 10.5 times (AOR: 10.535, 95%:1.881-58.988), 1st Cycle (grade 1-6)were 7times[AOR = 7.02, 95% CI: 2.46-20.07], Second cycle (grade 7-8) were 3.7times [AOR = 3.67, 95% CI: 1.19 -11.30)] more likely have been food insecured as compared to PLHIVs have an educational status of college and above. Agricultural practice is also other significant predictors of food insecurity among PLHIV in the study area. Respondents who did not practice agriculture or did not produce crops were 2.2 times (AOR: 2.22, 95%CI: 1.133-4.357) more likely have food insecured as compared to PLHIVs involved in agriculturalwho practices.

Depression is also major problem of people living with HIV, which subjected to food insecurity. PLHIVs who had major depression were 4.28 times (AOR: 4.277, 95%CI: 1.540-11.878) more likely to have food insecured as compared have no depression.

This study identified that the majority (81.3%) of the respondents had less than three times meal frequency per day. Those who had less than three times meal frequency per day were 4.54 time (AOR: 4.535(2.101-9.788)) more likely to have food insecured as compared to those who have more than three times meal frequencies per day.

Table 2: Factors associated at Bivariate and Multiple logistic regressions analysis with food insecurity among PLHIV in North Ethiopia, Fitcha Hospital

Variable name	COR(95%CI)		AOR(95%CI)	
	P-value			p-value
<b>Sex</b>		1	1	
Male				
Female	0.026	1.988(1.084-3.6462)	1.510(0.704-3.238)	0.289
<b>Educational status</b>				
Illiterate	0.006	4.500(1.539-13.160)	<b>4.183(1.734-10.093)</b>	0.001
Read & write	0.014	8.250(1.520-44.766)	<b>10.53(1.881-58.988)</b>	0.007
1st Cycle (1-6)	0.003	5.937(1.863-18.925)	<b>7.022(2.457-20.066)</b>	0.000
Second cycle (7-8)	0.067	3.000(0.925-9.726)	<b>3.669(1.191-11.304)</b>	0.024
High school(9-12)	0.452	1.545(.497-4.802)	2.279(0.756-6.876)	0.144
> 12(college & above)		1	1	
<b>Income (scale)</b>	<0.01	0.999(0.998-0.999)	<b>0.99(0.99-1.000)</b>	0.035
<b>Practice agriculture</b>				
Yes		1	1	
No	0.009	2.406(1.31-4.408)	<b>2.222(1.133-4.357)</b>	0.02
<b>Presence livestock</b>				
Yes		1	1	
No	0.001	2.406(1.31-4.408)	1.144(0.462-2.837)	0.771
<b>Access to food aids</b>				
Present		1	1	
Absent	0.038	0.217(.051-.918)	1.054(0.331-3.361)	0.929
<b>Depression status</b>				
Normal		1	1	
Mild depression	0.023	2.213(1.115-4.394)	1.061(0.472-2.387)	>0.05
Major depression	0.000	9.526(3.777-24.029)	<b>4.277(1.540-11.878)</b>	<b>0.005</b>
<b>Meal frequency</b>				
Less than three	0.001	7.871(4.138-14.971)	<b>4.535(2.101-9.788)</b>	0.001
Three and above times		1	1	

## Discussion

This study determined the level of food insecurity among PLHIV which were 87.4% respondents were food insecure with or without hunger. Even using hunger as criteria to classify the households of the PLHIV 47.9% of the households remained food insecure with moderate to severe hunger. This study is almost similar with study done in Dire Dawa which is (89.8%) and rural Indonesia (84%) of PLHIV were food insecure (15,16). However study done in Tanzania among PLHIV showed that (52.2%) food insecure which is lower than of the present finding(18). This discrepancy could be due to the difference in socio economic status of the study population.

Predictors of food insecurity include income, education, agricultural practice, depression and meal frequency. Monthly average incomes of the respondents were significant associated with food insecurity. This means house holds with high income have low food insecurity problem. Other study done in Dire Dawa, Tanzania, rural Indonesia and Malaysia (15, 16,17,18) showed that house holds with low income have high food insecurity problem. The relation ship between food insecurity and low income found among PLHIV in this study could also be result of HIV/AIDS. This is because frequent illness including opportunistic infections cause significant disability leading to reduced productivity depletion of savings and inability to earn more incomes (19).This relation ship between income and food insecurity among PLHIV explained that income is the main source of PLHIV's food.

A low level of education was more common in category of food insecure people living with HIV/AIDS(17) . This is explaining that the general population as well as PLHIV with higher education are more likely to be employed and thus get paid on regular basis or will be paid a much higher wage. On the other hand highly educated people are more likely to generate better income from income generating activities.

Furthermore low education is also associated with higher likelihood of HIV as well as poverty which is also associated with food insecurity. Thus because of low education and hence low income, PLHIV are unable to afford the right quantity and quality of food leading to food insecurity. This study showed that more than half of the respondents (68.7%) were attained low level of education. Similar study done in the Dasie Town and south East Ethiopia showed that 74.7% and 49% respectively were attained low level of education(20,21). This finding

is similar with the current finding but the study done in Addis Ababa City Administration showed less percent in which 45% were attained low level education (22). This small difference could be due to study setting difference (study subject in Addis Ababa were more access to education than others work oppuortunities, this study area main income generating activities is agriculture and livestock).

Food insecurity was significantly associated with poor or fair self-reported health and physical limitations. Depression and mental disorders are common symptom of people living with HIV/AIDS compounded with food insecurity problem. This report found that about 30% and 43.3% of the participants showed mild and major depression respectively. Research done on coping with chronic condition and coping with stigma reported that the use of avoidance coping strategy was consistently associated with increased psychological distress, including anxiety, depression and poor adjustment (23,24). Other similar study done in Northeast University, Boston indicated that 27% of Africa-American showed moderate to sever depression and 40% of Latino (spanic) showed moderate to sever depression(25). The discrepancy between the current study and result of Boston may be due to different socioeconomical characteristics of the the study populations.

Household wealth assets are important to lessen financial burden of households during events that stress household budgets. Land and livestock (animal husbandry) is the most important asset of people living with HIV/AIDS that may be use as food and income source(26). In this study, agricultural production activity is a significant predictor of food insecure house holds. Among study participants only 25.4% practice agriculture and Utilizing livestock production. This report is similar to the finding of PLHIV household food insecurity in poor rural Malaysia which only 22% practiced agriculture(18). In general there is little known about agricultural production and HIV/AIDS affected people and that calling for other researcher for further study the links between agriculture production and AIDs affected house holds.

The findings of this study showed significant relationship between low frequency of meals in a day and food insecurity. Ensuring that a PLHIV feeding pattern observes the desired feeding frequency and quality is crucial in the care of any PLHIV. Feeding needs are reflected in the 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 (15,27). Due to increased nutrient requirements, it is recommended that PLHIV consume three meals with snack each day. This study indicated that large proportion (97.2%) of study subjects were consumed three times per a day. This finding is almost in line with the study done in Tanzania which is (88%) of PLHIV had three and above meal frequency per day. However study done in the Dire-Dawa indicated that 66.4% of study subjects had three times and above meal per a day(15,17). This difference could be due to socio-economic difference and natural disaster that occurred in Dire-Dawa. On this research by considering the main strength of this research lies in its computer generated random sampling strategy for data collection, and the fact that used qualitative method to supplement the result and also to explore factors that are not addressed by quantitative survey. A set of reliability and validation rules were applied and all associated factors were taken after indication of significance in the “goodness of fit” for the models. Eventhough this study also had a few limitations: This study was facility-based among PLHIVs’ that results were not generalizable to the general population in the community and cause and effect relation was not assured because of cross-section study deign.

## Conclusion

The level of food insecurity among PLHIV attending ART at Fitch Hospital is very high (87.4%). Monthly income, meal frequency per day, educational status, not involved in agriculture practices and psychological depression were demonstrated significantly associated with food insecurity among PLHIVs and these factors should be emphatically considered during PLHIV’s nutritional program development. Therefore, Policy makers and Ministry of Health need to consider and plan for may increases numbers of food insecured PLHIVs among these population and would be better to give greater emphases to address PLHIV’s food rations’ in more comprehensive manner with ART treatments.

Policy makers and health planners would better to plan continue sustainable income generating activities which help the PLHIV for the long term strategy to respond for the food problems related to the life time epidemic (HIV/AIDS) with Gov’t and NGO.

The psychiatric clinic and Nurses in ART clinic should work in collaboration to support the psychological aspect of food insecure PLHIV.

Any interested researcher should conduct further study with longitudinal design which includes coping strategy on PLHIV community to pick the real picture of food insecurity among PLHIV.

## Acronym

**AOR** - Adjusted Odds Ratio

**ART** - Ant-Retroviral Therapy

**FAO** - Food and Agricultural Organization

**FS** - Food security



**GDP** - Gross-Domestic Product  
**HH FI** - House Hold Food Insecurity  
**HIV** - Human Immunodeficiency Virus  
**PLHIV** -People living with HIV  
**NGO**-Nongovernmental Organization

#### **Competing interests**

The authors declare that they have no competing interests.

#### **Authors' contributions**

Belachew Tolasa contributed to the study concept and design, writing the manuscript, and the analysis of the data. Dereje Bayissa contributed to writing the manuscript and the analysis and interpretation of the data. All co-authors:- Tefera Belachew and Temamen Tesfaye contributed to revision of the subsequent draft manuscripts and approved the final and this version of the manuscript.

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