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Nutritional Knowledge, Practices, Nutritional Status and The Associated Factors Among HIV Positive Mothers on Antiretroviral Therapy: Evidence From Cross Sectional Survey in Abay Choman Health Centers, Western Ethiopia

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Research Article

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ABSTRACT

Background: Lack of nutritional knowledge, inadequate nutritional practice and under nutrition in HIV positive mothers contribute to accelerate the progression of HIV/AIDS.

Methods: An institutional based cross-sectional study was conducted on nutritional knowledge, practice and status among 394 HIV positive mothers by systematic sampling techniques in Abay Choman health centers from February 2019 to August 2019. Structured and pre-tested questionnaires were used to collect data and analysis was done using SPSS for windows version 22.0. Binary and multiple logistic regressions were computed to identify the presence of association at $p<0.05$.

Results: This study revealed that more than half (58.9%) and (54.1%) of participants had good nutritional knowledge and practice, respectively. The prevalence of underweight, normal weight and overweight of the respondents were 31.2%, 59.1% and 9.7%, respectively. Age of mothers (AOR=2.1, 95% CI: 1.01, 4.6), marital status (AOR=4.26, 95% CI: 1.23, 14.81), educational level (AOR=3.57, 95%CI: 1.99, 6.43) and average monthly income (AOR=1.69, 95% CI: 1.03, 2.79) were significantly associated with level of nutritional knowledge during multivariate analysis. Educational level (AOR=3.83, 95%CI: 2.06, 7.13), family size (AOR=0.43, 95% CI: 0.23, 0.82), average monthly income (AOR=2.14,

Abbreviations: ART: Antiretroviral Therapy; HIV: Human Immunodeficiency Virus; AIDS: Acquired immunodeficiency Syndrome; BMI: Body Mass index; AOR: Adjusted Odd Ratio; COR: Crude Odd Ratio; SS: Statistical Packages for Social Sciences, ETB: Ethiopian Birr.

95% CI: 1.10, 4.17) and mothers' occupation (AOR=0.40, 95%CI: 0.22, 0.71) were significantly associated with the level of nutritional practice. Furthermore, marital status (AOR=0.34, 95% CI: 0.13, 0.86), educational level (AOR=0.54, 95% CI: 0.29, 0.99), average monthly income (AOR=0.44, 95% CI: 0.23, 0.85) and mothers' occupation (AOR=1.86, 95%CI: 1.06, 3.26) were significantly associated with nutritional status.

Conclusions: The level of nutritional knowledge and practice of respondents was poor and their under nutrition was higher. This is associated to educational level, average monthly income, mothers' occupation and marital status of the respondents. Therefore, health centers should have to work in the above gaps of nutritional knowledge and practice of HIV positive mothers through awareness creation in study area.

INTRODUCTION

Human Immune deficiency Virus (HIV) infection and Acquired Immune Deficiency Syndrome (AIDS) has become one of the world's most serious health and development challenges. Approximately 35 million people are living with HIV/AIDS through the world [1]. HIV can be spread through blood, semen, vaginal secretions, and breast milk [2]. For people infected by HIV, adequate nutrition is necessary to dwells as far as possible [3].

Malnutrition and HIV are related and aggravate one another in a vicious cycle [4]. Antiretroviral Therapy (ART) is an essential component of care for people living with HIV/AIDS and nutritional assessment and counseling are an integral part of all HIV treatment programs [5]. Adequate nutrition complements and effects of antiretroviral therapies, maintains body weight and improves the performance of the immune system already compromised by the infections [6].

Inadequate nutritional knowledge and practice among people with HIV infection lead to improper management of disease and lower immunological status as well as it accelerates the progression of HIV/AIDS related disease [7].

Among the infected countries, Sub Saharan Africa remains the most affected region by hosting 70% of the global disease burden. From these, nearly 60% of people living with HIV in sub-Sahara Africa are women of reproductive age. Ethiopia is one of the most affected countries by HIV/AIDS pandemic. Malnutrition is one of the main health problems facing women and children in Ethiopia and also the countries remains as the second highest rate of malnutrition in Sub-Saharan Africa [8].

The nutritional knowledge, practice and status of HIV positive mothers on antiretroviral therapy is not well known and to the best of our knowledge, there was no conducted studies on nutritional knowledge, practice and status of HIV positive mothers in the district. Therefore, this study was aimed to assess the nutritional knowledge, practice and status of HIV positive mothers with ages of 15-49 years attending antiretroviral therapy in Abay Choman district health centers, western Ethiopia.

METHODOLOGY

Study design and period

An institutional based cross-sectional study design was conducted to assess nutritional knowledge, practice and status of HIV positive mothers, age 15-49 years attending ART. The study was conducted from February 2019 to August 2019.

Study area

Abay Choman district is located 295 km to the west of Addis Ababa in Horo Guduru wollega Zone and Fincha is the capital town of the district which is 48 km away from zonal town, Shambu. It is known for having sugar factory and source of electricity. This district has 5 health centers. According to the 2007 national census report, the total population of this district was estimated to be 48,316 (24,972 males and 23,344 females), out of which 9,440 or 19.54% of its population were urban dwellers.

Source of population

All HIV positive mothers, age 15-49 years live in Abay Choman district and those who were attending health centers ART clinic.

Inclusion and exclusion criteria: All HIV positive mothers in the age group of 15-49 years old are included while, HIV positive mothers who were seriously ill, have hearing impairment, non-voluntary and pregnant mothers were excluded.

Sample size determination

The required sample size for this particular study was calculated using single population proportion formula, $n = \frac{(Z\alpha/2)^2.p.q}{d^2}$ Where, n=is required sample sizes; Zα/2=1.96, d=Margin of error=5% (0.05); p=prevalence of under nutrition among women with HIV/AIDS (42.3 %) in Humera Hospital [9]. And q=(1-p)=(1-0.423)=0.577. Therefore, $n=\frac{(1.96)^2\times 0.423 \times 0.577}{(0.05)^2}$=375, then after adding 5% of non-respondent rate, the final sample size was 394.

Sampling procedure

The sampling method used was systematic random sampling in which, the first study subject was selected using lottery method and then by systematic random sampling technique every 2th was selected from the entire sampling frame of 1092 HIV positive mothers to compose 394 as sample size.

Data collection procedure

Data collection technique was conducted using structured questionnaire and these questionnaires were developed in English language and then translated into a local language (Afan Oromo) and back into English to ensure consistency. An intensive training was given for data collectors and supervisors on the purpose of the study, data collection method and ethics of the study.

Assessment of nutritional knowledge and practice

Data on nutritional knowledge and practice was collected using a structured questionnaire from HIV positive mothers, age 15-49 years who attends ART in the study area.

Anthropometric measurement

The weight and height of the participants were measured after interview. Weight measured by using beam balance with light clothes, without shoes and read nearest to 0.5 kg. The height of respondents was measured using stand meter with bare foot and looks straight in horizontal plain. During this measurement the back of the head,

shoulders, buttocks and the heels touch the vertical stand and read nearest to 0.5 cm. Then, the Body Mass Index (BMI) was calculated by using weight in kilograms divided by the square of height in meters (kg/m^2).

Data quality control

To assure the quality of data, the English version of the questionnaire was carefully translated into Afan Oromo and back to English by language translators in order to check for validity [10]. The first questionnaires pre-tested on 5% of HIV positive mothers before actual data collection.

Statistical analysis

The collected data was first checked for completeness, coded and entered into the computer using SPSS version 22 statistical software. Bivariate and multiple logistic regressions were computed to measure association between dependent variable and independent at p-value<0.05.

RESULTS

Socio-demographic characteristics of the respondents

About 394 HIV positive mothers were sampled for this study with response rate of hundred percent (100%). One third 133 (33.8%) of respondents were in the age group of 31-40 years and more than half 213(54.0%) of them were married. With regard to residence, more than half 237(60.2%) of respondents live in urban area [11]. In connection to average monthly income in ethio-birr, more than half 204 (51.8%) of participants were earned ≤ 1000 birr (Table 1).

Table 1. Frequency distribution of socio-demographic characteristics of respondents (n=394).

Variables	Category	Frequency	Percent
	15-20	96	24.40%
Age of mothers	21-30	86	21.80%
	31-40	135	34.30%
	41-49	76	20.10%
Marital status	Single	28	7.10%
	Married	213	54.00%
	Divorced	85	21.60%
	Windowed	68	17.30%
Educational level	Uneducated	140	35.50%
	Completed primary	163	41.40%
	Tenth completed and above	91	23.10%
Place of residence	Urban	237	60.20%
	Rural	157	39.80%
Family size	≤ 3	135	34.30%
	04-06	189	47.90%
	≥ 7	70	17.80%
Average monthly income	≤ 1000	204	51.80%
	1001-2000	73	18.50%
	≥ 2001	117	29.70%
Religion	Orthodox	141	35.80%

	Muslim	4	1.00%
	Protestant	245	62.20%
	Wakefata or others	4	1.00%
mothers' occupation	House wife only	87	22.10%
	Merchant	66	16.80%
	Governmental employee	123	31.20%
	Daily laborer	118	29.90%
	Farmer	102	25.90%
Husband occupation	Governmental employee	135	34.20%
	Daily laborer	104	26.40%
	Merchant	53	13.50%
Ethnic group	Oromo	335	85.00%
	Amhara	49	12.40%
	Others	10	2.50%

As described in Table 1 above, with regard to religion, the majority 245 (62.2%) of respondents were protestant. More than one quarter 123 (31.2%) of the participants were governmental employee. In connection to their husband occupation, 135 (34.2%), 104 (26.4%), 102 (25.9%) and 53 (13.5%) of them were governmental employees, daily laborers, farmers and merchants, respectively. more than three fourth 335 (85.0%) of respondents were Oromo ethnic group.

Nutritional knowledge of respondents in the study area

More than two third 263 (66.8%) of respondents had knowledge about fish as source of protein and nearly two third 258 (65.5%) of them had information about protein rich food builds and repair body tissues [12]. More than two third 276 (70.0%) of the respondents had knowledge about carbohydrate and lipids as energy providers. This study also showed that, more than three fourth 301 (76.4%) of participants knew the importance of balanced diet as preventing infection (Table 2).

Table 2. Frequency distribution of nutritional knowledge of respondents in study area (n=394).

Variables/statements	Yes	No	Don't know
	n (%)	n (%)	n (%)
Knowledge about			
Fish as sources of protein	263 (66.8)	99 (25.1)	32 (8.1)
The three main component of food groups	219 (55.6)	136 (34.5)	39 (9.9)
Food sources of carbohydrate	207 (52.5)	146 (37.1)	41 (10.4)
Protein rich food builds and repair body tissues	258 (65.5)	113 (28.7)	23 (5.8)
Carbohydrate and lipid as energy providers	276 (70.0)	96 (24.4)	22 (5.6)
Balanced diet as preventing infection	301 (76.4)	81 (20.6)	12 (3.0)
Benefit of dietary diversity to HIV positive	300 (76.1)	64 (16.3)	30 (7.6)
Source of iron	162 (41.1)	180 (45.7)	52 (13.2)
Source of vitamin- E	205 (52.0)	118 (29.9)	71 (18.0)
Water as nutrients	225 (57.1)	129 (32.7)	40 (10.2)

Fruit and vegetable rich in vitamins and	247 (62.7)	109 (27.7)	38 (9.6)
Banana as control of diarrhea in HIV patients	120 (30.5)	177 (44.9)	97 (24.6)
Over all levels of nutritional knowledge			
Good	232 (58.9)		
Poor	162 (41.1)		

The majority 300 (76.1%) of respondents knew about benefit of dietary diversity to HIV positive patients. Respondents had knowledge about water as nutrients, fruit and vegetable rich in vitamins and mineral, the importance of banana as control of diarrhea in HIV patients 57.1%, 62.7% and 30.5%, respectively. Regarding the overall level of nutritional knowledge, more than half 232 (58.9%) of the respondents had good nutritional knowledge while 162 (41.1%) of them had poor nutritional knowledge in the study area [13].

Nutritional practice of respondents in the study area

More than two third 274 (69.5%) of participants ate breakfast every day and 208 (52.8%) of them had accepted as preparing balanced meal is a time consume. Nearest to three fourth 282 (71.6%) of respondents were wash fruit and vegetables before consumption in the study area. The majority 326 (82.7%) of the respondents were took ART after a meal (Table 3).

Table 3. Frequency distribution of nutritional practice of respondents in study area (n=394)

Variables/Statement	Yes	No	Don't know
	n (%)	n (%)	n (%)
Eating breakfast every day	274 (69.5)	111 (28.2)	9 (2.3)
Number of meals consumed in the preceding 24 hours (≥3)	125 (31.7)	269 (68.3)	0 (0)
Eating milk and milk product	233 (59.1)	137 (34.8)	24 (6.1)
Preparing balanced meal is not time consuming	164 (41.6)	208 (52.8)	22 (5.6)
Washing fruit and vegetables before consumption	282 (71.6)	98 (24.9)	14 (3.5)
Taking ART after a meal	326 (82.7)	37 (9.4)	31 (7.9)
Eating snacks between main meal	175 (44.4)	192 (48.7)	27 (6.9)
Eating food during period of illness	165 (41.9)	200 (50.8)	29 (7.3)
Drinking at least 4L of water per day	136 (34.5)	227 (57.6)	31 (7.9)
Washing hand and utensils before & after preparation of food	337 (85.5)	33 (8.4)	24 (6.1)
Number of food groups consumed in the preceding	130 (33.0)	264 (67.0)	0 (0)

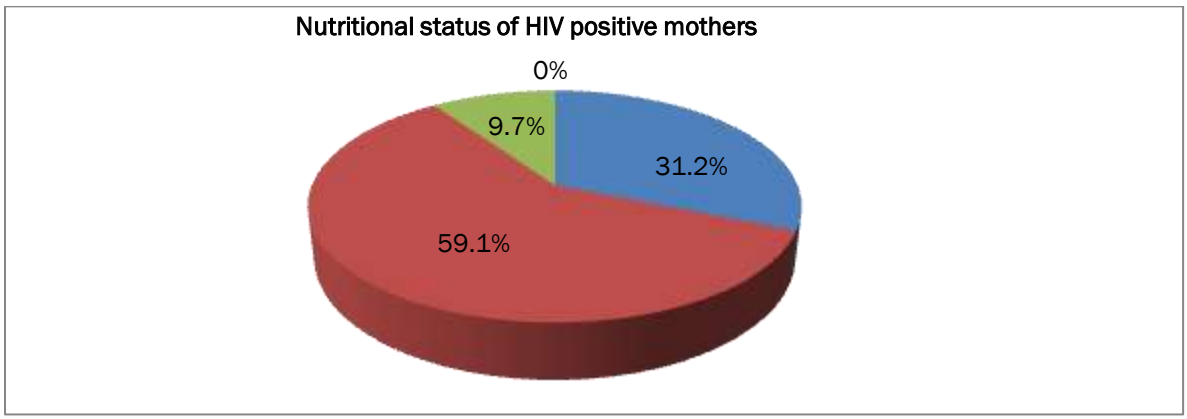
24 hours (≥ 6)			
Over all levels of nutritional practice			
Good	213 (54.1)		
Poor	181 (45.9)		

More than half 200(50.8%) of participants did not eat food during period of illness. The majority 337 (85.5%) of respondents were washed their hand and utensils before and after preparation of food. In this study, more than half 213 (54.1%) and 181 (45.9%) of participants had good and poor nutritional practice, respectively.

Nutritional status of respondents in the study area

The prevalence of overall under nutrition (BMI<18.5kg/m^2) in this study was 31.2%. The mean BMI of respondents was 20.48 kg/m^2 with standard deviation (SD ± 3.2). The finding revealed that more than half 233 (59.1%) and 38 (9.7%) of the respondents had normal weight (18.5-24.9 kg/m^2) and overweight (25-29.9 kg/m^2), respectively in the study area (Figure 1).

Figure 1. The nutritional status of HIV positive mothers in the study area. **Note:** Underweight Normalweight Overweight



Factors associated with nutritional knowledge of respondents

In binary logistic regression: age of mothers, marital status, educational level, average monthly income and mothers' occupation were significantly associated with level of nutritional knowledge of respondents in the study area [14]. However, in multivariate analysis after controlling the possible variables: age of mothers, marital status, educational level and average monthly income were identified as important predictors of nutritional knowledge among the study participants. Age of participant was one of the factors associated with nutritional knowledge in the study area. Accordingly, study participants whose age groups 41_49 year were 2.16 times more likely knowledgeable than respondents whose age groups 15_20 year (AOR=2.16, 95%CI: 1.01, 4.65). The odds of nutritional knowledge was 4.26 times higher among HIV positive mothers were married compared to who were single mothers (AOR=4.26, 95%CI: 1.23, 14.81) (Table 4).

Table 4. Factors associated with nutritional knowledge of respondents in study area (n=394).

Variables	Frequency	Percent	COR (95%CI)	AOR (95%CI)
Age of mothers				
15-20	96	24.4	1	1
21-30	86	21.8	1.91(1.04,3.49)*	1.01(0.41, 2.51)
31-40	133	33.8	1.48(0.80, 2.74)	0.83(0.33, 2.10)
41-49	79	20.1	2.41(1.36,4.27)*	2.16(1.01,4.65)*
Marital status				
Single	28	7.1	1	1
Married	213	54.1	2.81(1.12,7.18)*	4.26(1.23, 14.81)*
Divorced	85	21.6	1.80(1.04,3.13)*	1.89(0.80, 4.49)
Window	68	17.3	1.04(0.54, 1.97)	0.80(0.35, 1.85)
Educational level				
Uneducated	140	35.5	1	1
completed primary	163	41.4	3.58(2.05,6.25)*	3.57(1.99, 6.43)*
Tenth complete and above	91	23.1	0.91(0.54, 1.53)	0.93(0.537, 1.62)
Average monthly income				
≤1000	204	51.8	1	1
1001-2000	73	18.5	1.62(1.03,2.57)*	1.69(1.03,2.79)*
≥2001	117	29.7	1.24(0.69, 2.23)	1.44(0.76, 2.76)
Mothers' occupation				
House wife only	87	22.1	1	1
Merchant	66	16.8	0.82(0.4, 1.43)	0.96(0.52, 1.77)
Governmental employee	123	31.2	0.66(0.36, 1.22)	0.86(0.44, 1.68)
Daily laborer	118	29.9	0.54(0.32,0.89)*	0.62(0.36, 1.08)

Note: *P<0.05 (Statistically significant), COR=Crude odds ratio, AOR=Adjusted odds ratio

Educational status of HIV positive mother was significantly associated with nutritional knowledge in this study area. The respondents who completed primary school were 3.57 times more likely knowledgeable compared to those who hadn't formal education. Participants who earned average monthly income between 1001_2000 birr were 1.69 times more likely knowledgeable about nutrition than those who had earned ≤ 1000 birr in study area.

Factors associated with nutritional practice of respondents

In this study educational level, family size, average monthly income and mothers' occupation had significant association with nutritional practice of respondents in both bivariate and multivariate analysis. Respondents who completed primary school were 3.83 times more likely to nutritional practice as compared to those who hadn't formal education. In addition, in a multivariate analysis participants who had ≤ 3 family sizes were 57% more likely to nutritional practice than those who had 4_6 family size (Table 5).

Table 5. Factors associated with nutritional practice of respondents in study area (n=394).

Variables	Frequency	Percent	COR(95%CI)	AOR(95%CI)
Educational level				
Uneducated	140	35.5	1	1
completed primary	163	41.4	4.09(2.28,7.33)*	3.83(2.06,7.13)*
Tenth complete and above	91	23.1	0.99(0.59, 1.65)	0.84(0.48, 1.46)
Family size				
≤ 3	135	34.3	1	1
04-Jun	189	48	0.52(0.29,0.93)*	0.43(0.23,0.82)*
≥ 7	70	17.8	1.49(0.84,2.65)	1.29(0.69, 2.40)
Average monthly income				
≤ 1000	204	51.8	1	1
1001-2000	73	18.5	1.76(1.11,2.80)*	1.84(1.09,3.03)*
≥ 2001	117	29.7	1.78(0.98, 3.24)	2.14(1.10,4.17)*
Mothers' occupation				
House wife only	87	22.1	1	1
Merchant	66	16.8	0.52(0.29,0.93)*	0.56(0.30, 1.06)
Governmental employee	123	31.2	0.76(0.40, 1.44)	0.91(0.45, 1.85)
Daily laborer	118	29.9	0.40(0.23, 0.68)*	0.40(0.22,0.71)*

Note: *P<0.05 (Statistically significant), **Abbrevations:** COR: Crude odds ratio, AOR: Adjusted odds ratio

The participants who earned average monthly income between 1001-2000 and ≥ 2001 increases the odds level of nutritional practice by 1.84(AOR=1.84, 95% CI: 1.09, 3.03) and 2.14 (AOR=2.14, 95% CI: 1.10, 4.17), respectively were associated to nutritional practice in the study area. The respondents whose occupational status was daily laborers were 60% less likely associated to nutritional practice than those who were housewife only by occupation (AOR=0.40, 95% CI: 0.22, 0.71).

Factors associated with nutritional status of respondents

In this study marital status, educational level, average monthly income and mothers' occupation had significant association with nutritional status of respondents (p<0.05) in both bivariate and multivariate analysis. Participants who were single mothers were 66% more likely exposed to malnourished as compared to those who were married (AOR=0.34, 95%CI: 0.13, 0.86). The result of study revealed that uneducated HIV positive mothers' were about 46% more likely under nutrition than those who completed primary school (AOR=0.54, 95%CI: 0.29, 0.99) (Table 6).

Table 6: Factors associated with nutritional status of respondents in study area (n=394)

Variables	Body mass index (Kg/m²)		COR (95%CI)	
	Underweight (BMI<18.5 kg)	Normal weight (BMI ≥ 18.5 kg)		
Marital status				
Single	15	13	1	1
Married	59	154	0.39(0.16,0.96)*	0.34(0.13, 0.86)*
Divorced	28	57	1.17(0.64, 2.12)	1.22(0.66, 2.26)
Window	21	47	0.91(0.46, 1.80)	0.86(0.42, 1.74)
Educational level				
Uneducated	54	86	1	1
Completed primary	47	116	0.51(0.28,0.91)*	0.54(0.29, 0.99)*
Tenth complete and above	22	69	0.79(0.44, 1.42)	0.87(0.47, 1.61)
Average monthly income				
≤1000	69	135	1	1
1001-2000	27	46	0.59(0.35,0.99)*	0.61(0.35, 1.04)
≥2001	27	90	0.51(0.27,0.97)*	0.44(0.23, 0.85)*
Mothers' occupation				
House wife only	24	63	1	1
Merchant	18	48	1.80(0.99,3.27)	1.68(0.90, 3.10)
Employee	33	90	1.83(0.95,3.52)	1.74(0.88, 3.47)
Daily laborer	48	70	1.87(1.09,3.22)*	1.86(1.06, 3.26)*

Note: * P<0.05(Statistically significant), **Abbrevtaions:** COR: Crude Odds Ratio; AOR: Adjusted Odds Ratio

Participants who earned average monthly income ≤ 1000 birr were 66% more likely exposed to malnourished than those who had earned ≥ 2001 birr (AOR=0.44, 95% CI: 0.23, 0.85) in the study area. Finding of this study showed that respondents with daily laborers by occupation were 1.86 times more likely exposed to undernourished than those who were house wife only (AOR=1.86, 95% CI: 1.06, 3.26).

Correlation between nutritional Knowledge, practice and status of respondents

The Pearson correlation between nutritional knowledge, practice and status of HIV positive mothers is shows in Table 7. Bivariate analysis showed that level of nutritional knowledge scores had significantly positive correlations

with nutritional practice (r=0.420, p=0.001) while it had negative correlation with body mass index (r= -0.224, p=0.001) of respondents.

Table 7: Pearson's correlation between nutritional Knowledge, practice and status

	Knowledge	Practice	BMI
Knowledge	1		
Practice	0.420*	1	
BMI	-0.224*	-0.403*	1

Note: *p<0.05 (Correlation is significant)

However, the level of nutritional practice of respondents had negatively correlated with nutritional status in the study area (r= -0.403, p=0.001).

DISCUSSION

The study showed that 58.9% and 41.1% of respondents had good and poor nutritional knowledge, respectively. This finding is comparatively lower than the study conducted in Uganda, which shows that 88% of the women living with HIV/AIDS had good nutritional knowledge, whereas 70.9% of them had adequate nutritional knowledge among people living with HIV in Ghana [15] and the study conducted in Manzini, Swaziland demonstrated that, 67% had good nutritional knowledge among pregnant and Lactating Women living with HIV/AIDS [16,17].

In addition, the result of the study relatively higher than the study conducted in Bahir Dar Felege Hiwot Referral Hospital and shows that, 21.7% had good nutritional knowledge among adults on ART and Southwest Nigeria and shows that, 23.5% had good nutritional knowledge in women living with HIV/AIDS [18]. The difference of the results might be because of educational level, health service and awareness about the importance of nutrition. The respondents whose age groups 41-49 year were 2.16 times more likely knowledgeable than respondents whose age groups 15-20 year. This finding is supported by the study conducted in Nigeria which shows that there is significant relation between age of women and knowledge level. Women with HIV/AIDS age greater than 40 years had more nutritional knowledge than the youngest women.

The odd of nutritional knowledge was 4.26 times higher among HIV positive mothers who were married compared to single mothers. The result of this study is similar with the study conducted in Nigerial, married women were 78.7% more likely to had nutritional knowledge than unmarried women living with HIV/AIDS. The respondents who completed primary school were 3.57 times more likely knowledgeable compared to those who hadn't formal education. This finding is supported by the study conducted in Lagos, southwest Nigeria.

The participants who earned average monthly income between 1001-2000 birr were 1.69 times more likely knowledgeable about nutrition than those who had earned ≤ 1000 Ethiopian birr ETB) in study area. This study is supported by research conducted in India and shows that monthly income payment has an important role in getting the formal education. Therefore, the women from higher income group usually possess radio and television in which they are accessible to the education.

The result of the study revealed that more than half 54.1% and 45.9% of respondents had good and poor nutritional practice. This finding is comparatively lower than the study conducted in Lagos, Southwest Nigeria which

shows that 65.1% of women living with HIV/AIDS have good nutritional practice. In addition, this finding is higher than the study conducted in Bahir Dar city and Manzini, Swaziland which shows that, 30.4% and 51% of respondents with HIV/AIDS have good nutritional practice.

The respondents who completed primary school were 3.83 times more likely to nutritional practice as compared to those who hadn't formal education. This finding was supported by the study conducted in Jinja district, Eastern Uganda and shows that nutritional education and good nutritional practice was found to have positive correlation. The participants who earned average monthly income between 1001-2000 and ≥ 2001 increases the odds level of nutritional practice by 1.84, respectively were factors associated to nutritional practice in the study area.

The prevalence of overall undernourished (BMI<18.5 kg/m^2) in this study was 31.2% which is comparatively lower than the study conducted in Tigray region, Humera hospital 42.3% of women under nutrition [19], but it is higher than the previous study, the magnitude of under nutrition in Jimma university is 27.2%, in Bahir Dar is 21.1%, in Dilla university referral hospital is 12.3% and in Nekemte referral hospital and Health Centers is 27%. This discrepancy might be because of the present study that focused only on mothers which could increase the prevalence of under nutrition. Since body mass index is affected by sex, age and muscle mass.

Participants who were single mothers were 66% more likely exposed to malnourished as compared to those who were married. Never-married women belong to households with relatively poor economic status, which may also make it more difficult to obtain sufficient food [20]. Uneducated respondents were about 46% more likely under nutrition than those who completed primary school. Dietary intake plays a critical role in maintaining optimal nutrition status and PLWHA may be unable to choose and eat a varied diet if they do not possess adequate nutrition knowledge [21].

The respondents who earned average monthly income ≤ 1000 birr were 66% more likely exposed to malnourished than those who had earned ≥ 2001 birr. This finding is supported by the study conducted in Nekemte Referral Hospital and Health Centers, showed that the household economic status is positively associated with maternal nutrition status, which is a prerequisite for access to adequate dietary intake and improved nutritional status for members of maternal nutritional status [22].

The participants with daily laborers by occupation were 1.86 times more likely exposed to undernourished than those who were house wife only. The higher risks of developing malnutrition in unemployed people with HIV/AID were greater than the employment subject [18]. Nutritional knowledge had positive correlation with nutritional practice in this study area. Respondents who had more nutritional knowledge were more likely exposed to nutritional practice and again the more practice had the more resistant to disease. However, nutritional knowledge may not obviously translate into a nutritional practice. Hence, there is need to consider the broader social, cultural and economic factors.

CONCLUSIONS

This study revealed that, 41.1% of respondents had poor nutritional knowledge in study area. Age of mothers, marital status, educational level and average monthly income were associated factors with nutritional knowledge. In this study 45.9% of the respondents had poor nutritional practice. Educational level, family size, average monthly income and mothers' occupation were associated factors with nutritional practice. The overall prevalence of under nutrition (BMI<18.5kg/m^2) was 31.2%. Educational level, average monthly income, mothers' occupation and marital status were associated factors with nutritional status. It is concluded that the level of nutritional knowledge

and practice of respondents in this study was poor and under nutrition was higher. This is associated to educational level, average monthly income, mothers' occupation and marital status of the respondents in study area. The health centers should have to work to fill the above gaps of nutritional knowledge and practice of HIV positive mothers through awareness creation.

LIMITATIONS OF THE STUDY

In this study, an institutional based single population proportion cross-sectional study design was used that limits the relevance of the risk factor analysis to the entire population of HIV positive mothers on ART.

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AVAILABILITY OF DATA AND MATERIALS

All the required data will be available upon request.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical clearance was obtained from Wollega University Research Ethics Review Committee. The permission and supportive letter was obtained from Abay choman district informing the respective health centers. Verbal informed consent was obtained from each respondent after briefly explaining the purpose, and benefit of the study. Confidentiality was maintained by avoiding personal identifiers and keeping the data locked.

COMPETING INTERESTS

The authors declare that they have no competing interests.

CONSENT FOR PUBLICATION

Not applicable

AUTHORS' CONTRIBUTIONS

HFG conceived the study, developed the title, coordinated the data collection activity, carried out the statistical analysis and reviewing the manuscript. FK participated in the design of the study, tool development, data collection supervision, statistical analysis and drafting the manuscript. MD reviewing and preparing the final manuscript and facilitated the publication process. All authors read and approved the final manuscript.

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