Prevalence and Factors Associated with Under-nutrition among HIV Positive Women aged 18-49, attending The AIDS Support Organization in Kampala, Uganda

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ABSTRACT

Background: The prevalence of malnutrition among HIV positive adults in the general population is approximately 20-25% in Uganda. The factors associated with malnutrition in the HIV population are not yet sufficiently investigated, particularly among women seeking HIV care.

Objective: This study assessed the prevalence of under-nutrition among HIV positive women aged 18-49 attending The AID Support Organisation (TASO), and investigated demographic, medical, and lifestyle factors associated with under-nutrition.

Methods: The study was conducted in December 2017, and utilized a cross-sectional design. 130 HIV positive women were sampled from patients visiting TASO. Demographic, lifestyle, and medical factors were collected using face to face interviews, and anthropometric measures (weight in Kg and height in cm) carried out among the respondents. Data was analyzed using chi-square test and logistic regression, in Statistical Package for the Social Sciences (SPSS).

Results: The prevalence of under nutrition was 52.3%. Factors that increased the likelihood of under-nutrition, were low dietary diversity (AOR 11.15, 95% CI 2.52 – 49.40), alcohol consumption (AOR 2.98, 95% CI 1.02 – 8.71), and longer duration on Anti-retro viral therapy length (ART) length.

Conclusion: The findings revealed high prevalence of under-nutrition (52.3%) among HIV positive women attending TASO. Nutritional education, management and nutritional support, should be key interventions aimed at improving the nutritional status of People Living with HIV/AIDS (PLWHA) during the course of care.

Keywords: Prevalence, Under-nutrition, Women, HIV/Aids, Risk Factors, Uganda.

1. INTRODUCTION

HIV/AIDS is a leading cause of death and disease burden, especially in Sub-Saharan Africa [1]. In 2015 there were approximately 2.1 million new HIV infections worldwide, adding up to a

total of approximately 36.7 million people living with HIV [2].Sub-Saharan Africa remains most severely affected, with nearly 1 in every 25 adults (4.4%) living with HIV and accounting for over a half of the people living with HIV worldwide [2], and with 43% of new cases in East and Southern Africa.

Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients [3]. It refers to both under nutrition and over-nutrition [4]. As the later is rare in HIV populations, this study focused on under-nutrition. Between 19-63% of patients living with HIV/AIDS in Sub-Saharan Africa display a low BMI at ART initiation [5-7], and this is associated with poor treatment outcomes and increased mortality [8-10].

When coupled, under nutrition and HIV induce a vicious cycle that hastens disease progression and increases mortality[11]. Despite increased access to HAART, poor nutritional status persist and continues to be associated with negative health outcomes [10].

Uganda registers 230 HIV new infections per day. Despite widely available ARVs, 76 people die of AIDS-related causes every single day, and the HIV prevalence is almost three times higher among females (7.6%) than males (4.7%) [12]. Uganda's burden of malnutrition in HIV is currently estimated at 20-25% among adults initiated on Anti-retro Viral Treatment (ART), during the early stages of infection. Despite the high burden of HIV, there has been wide distribution of antiretroviral drugs. [13], although drug supplies have increased in volume, the national programme faces delays in procurement and distribution, poor storage, and weak quality control, stock-outs, and chronic lack of man-power.

Furthermore, studies undertaken in the country support the notion, increased calorie burning among HIV infected people compared to those who are not infected, hence increasing the risk of malnutrition [14].

Under-nutrition in HIV does not occur in isolation. There are a number of factors contributing to under-nutrition, in this vulnerable condition. The conceptual framework (adapted from the UNICEF conceptual framework 2015) divides these factors associated with under-nutrition of HIV-positive women on ART into four categories, namely; nutrition-related factors which include individual food dietary diversity, Medical factors; ART length, socio-demographic and economic factors; age, religion, marital status, education, and family size, and

lifestyle factors; alcohol consumption, and cigarette smoking.

Indeed, this framework has been supported by other studies in regards to the different factors associated with under-nutrition in HIV positive women.

Some studies have indicated that people with HIV tend to burn around 10% more calories while resting, compared to those who are uninfected [15], and yet a study by [16] noted that there is very low dietary diversity in developing countries, moreover their daily diet was dominated by one main staple food group mainly cereals, affecting their nutritional status.

A study by [17] in Ethiopia, was carried out and it revealed that the prevalence of malnutrition was increased when the age of the study subjects was increased. A study by Houtzager found out that nutrition education can assist PLWHA in various settings access and make nutritious, affordable and culturally appropriate food choices. Alcohol use was found to be associated with HIV in recent systematic reviews and meta-analyses

There have been few studies carried out in Uganda, and therefore there is more need for further research to be carried out, hence this study assessed the prevalence and risk factors of HIV positive women aged 18-49 attending The AIDS Supported Organisation Supported Public Health Facility (TASO), Mulago-Kampala.

2. METHODS AND MATERIALS

2.1 Study design

This was a cross sectional study conducted using quantitative methods of data collection during December of 2017.

2.2 Study population and sampling procedure

The study comprised of HIV positive women aged 18-49 actively attending TASO supported Public Health Facility, Mulago - Kampala, in December 2017.

On 3 consecutive days, respondents where conveniently picked from a pool of patients waiting to see a healthcare provider at TASO. The researcher approached the respondents and if consent was given, the respondent was interviewed and measured. This process continued until 130 patients were all interviewed and measured.

2.3 Inclusion criteria and exclusion criteria

All HIV positive women who were aged 18-49, and actively attending TASO supported Public Health Facility,

Mulago, constituted the sampling frame for this study, and all pregnant HIV positive women, and severely ill women aged 18-49 respectively attending TASO supported Public Health Facility Mulago, were excluded.

2.4 Sample size determination

The approximated total population of both women and men who attended treatment at TASO twice a week (Tuesday and Thursday) was 570. And out of that, 380 were women, and 250 of them met the criteria of this study. The sample size was calculated using Kish, Leslie (1965).

$$n = \frac{Z^2 PQ}{\partial^2}$$ Where; n = required sample size, Z= Standard deviation, 1.96, P = A value of 10.3% representing the prevalence of adult malnutrition (Olalekan A, 2008).

Q = (1-P), Estimated proportion of the population with adequate dietary intake.

∂ = Margin of error (5%). Substituting in the formula above;

n = 1.96² x 0.103 x 0.897 = 142
              0.05²

130 complete responses were analyzed.

2.5 Sampling and data collection

Convenience sampling technique was applied for sample selection. Data was then collected through face-to-face interviews, by trained enumerators using a pre-tested structured questionnaire that was developed in English language.

2.7 Measurement of variables

2.7.1 Dependent variable

Under-nutrition among HIV positive women was the outcome of interest. It was measured using BMI. Weights of HIV positive women were measured using seca professional medical scale, model 761 and recorded to the nearest 0.1 kilogram and their heights then measured using Seca Microtoise, model 206 (Wall hanging stadiometre) to nearest 0.1 centimeters. A composite variable BMI was then created to group the women into those who had normal, under or over nourished based on standard

Independent variables

Nutrition-related factors

Individual Dietary Diversity

Measured using 24-hour dietary recall. Women were asked what kinds of foods and drinks they consumed in the previous 24 hours. Responses were then recorded and then grouped into five food groups.

Socio-demographic and economic:

The following demographic factors were included in the study.

Age: was measured in the questionnaire by asking the women how old they were at the time of the survey. Then the responses were recorded in years and then later on grouped into 18 to 24, 25 to 29, 30 to 34, 35 to 39, 40 to 44, and 45 to 49.

Marital status: Was measured in the questionnaire by asking the women whether they were married, or not, and the responses were recorded and analyzed as single, separated, widowed, and married.

R**eligion:** was measured in the questionnaire by asking the women what their religion was, and this was recorded as Catholic, Protestant/Anglican, Pentecostal, SDA and Muslims, and this was later grouped as Christianity and Muslims.

Family size: was measured in the questionnaire by asking the women the number of dependents they live with, and this was recorded and analyzed as ≤ 5, and >5.

Education status: was measured in the questionnaire, by asking the women the highest level of education achieved, and this was recorded as No formal education, lower primary, upper primary, ordinary secondary, advanced secondary, and tertiary institution. This was later grouped as No formal education, primary education, and secondary education and above.

Lifestyle factors

Smoking: was measured using a questionnaire, by asking the women whether or not they use tobacco, such as cigarettes, pipes, and Shisha. This was recorded and analyzed as Yes or No.

Alcohol consumption: was measured using a questionnaire, by asking the women whether or not they consumed alcohol such as beer, wines, spirits, and this was recorded, and analyzed as Yes or No.

Medical factor

ART length: was measured in the questionnaire by asking the women their duration on anti-retro viral treatment.

3. DATA PROCESSING AND ANALYSIS

Questionnaires were checked for completeness and consistency, at the end of the day, before data entry. Data was then re-categorized (cleaned), coded and processed into SPSS version 20. Descriptive data was reported using frequencies, tables, and proportions.

Bivariate analysis, was reported using a Chi-square test, at level 0.1. Variables that showed statistical significance qualified for the logistic regression.

Odds ratio obtained from logistic regression, were applied to assess the association between outcome and risk factors after controlling for possible confounders, at level 0.05.

4. ETHICAL CONSIDERATIONS

Permission was granted for the study after the proposal was scrutinized by the institution (Victoria University). In addition, TASO approved of the study, following a review of the proposal.

Informed consent was sought from the respondents, before data was carried out, and confidentiality was obtained throughout the whole study.

5. RESULTS

Out of the 142 participants, 130 participated in the survey, during the period (December 2017) of data collection. Therefore the response rate was 92%.

The prevalence of under nutrition (Body Mass Index <18.5Kg/m^2), was 52.3%

5.1 Socio-demographic and economic, lifestyle, medical and nutritional factors

As exhibited in table 1, majority of the respondents were between 18-29 years, 83.1% were Christians, 31.5% were married, 46.2% had no formal education, 59.2% had more than 5 dependents, 50% drank alcohol, 8.5% smoked, 57.7% ate from 1-3 food groups, 52.3% were on ART for more than 12 months, and 52.3% were under-nourished.

Table 1: Characteristics of the respondents

Characteristics	Frequency (n=130)	Percentage
Socio-demographic and economic factors		
Age category		
18 to 24	38	29.2
25 to 29	38	29.2
30 to 34	21	16.2
35 to 39	11	8.5
40 to 44	12	9.2
45 to 49	10	7.7
Religion		
Christianity	108	83.1
Muslim	22	16.9
Marital status		
Single	37	28.5
Separated	32	24.6
Widowed	20	15.4
Married	41	31.5
Highest level of education		
No formal education	60	46.2
Primary education	39	30
Secondary education and above	31	23.8
Family size		
≤ 5	53	40.8
>5	77	59.2
Lifestyle factors	-	-
Drinking alcohol		
Yes	65	50
No	65	50
Smoking		
Yes	11	8.5
No	119	91.5

Nutrition-related factors	-	-
Individual dietarydiversity within 24 hours		
1-3 food groups.	75	57.7
4 and above food groups.	55	42.3
Medical factor	-	-
ART Length		
≤ 12 months	62	47.7
>12 months	68	52.3
Body Mass Index		-
Well nourished	62	47.7
Under nourished	68	52.3

5.2 Bivariate analysis

Table 2: Demographic, lifestyle, nutrition-related and medical factors associated with underweight

Characteristics	Total n=(130)	Undernourished	%	P value
Social demographic and economic characteristics.				
Age				
18-24	38	24	63	
25-29	38	27	71	
30-34	21	8	38	
35-39	11	4	36	
40-44	12	2	17	
45-49	10	3	30	**0**
Marital status.				
Single	37	18	49	
Separated	32	22	69	
widowed	20	13	65	
Married	41	15	37	**0.02**
Highest level of education.				
No formal education	60	40	67	
Primary education	39	11	28	
Secondary education and above	31	17	55	**0**
Religion.				

Christianity	108	61	57	
Muslim	22	7	32	**0.03**
Family size.				
≤ 5	53	27	51	
> 5	77	41	53	0.79
Lifestyle factors				
Drinking alcohol				
Yes	65	44	68	
No	65	24	37	**0**
Smoking				
Yes	11	7	64	
No	119	61	51	0.43
Nutrition realated factors.				
24 hour dietary diversity.				
1-3 food groups (LDD)	75	58	77	
4 and above groups (HDD)	55	10	18	**0**
Medical factor				
ART length.				
≤ 12 months	62	18	29	
>12 months	68	50	74	**0**

As exhibited in table 2, there were variations in the prevalence of under-nutrition, with highest prevalence among ages between 25-29, separated women, those who had no formal education, Christians, those who drank alcohol, those who ate from 1-3 food groups, and those who were on ART length for more than 12 months.

5.3 Multivariate analysis

Factors that increased the likelihood of under-nutrition, were low dietary diversity (AOR 11.15, 95% CI 2.52 – 49.40), alcohol consumption (AOR 2.98,

95% CI 1.02 – 8.71), and longer duration on Anti-retro viral therapy length (ART) length 81%, after controlling for all other confounders.

Table 3: Odds ratio of factors associated with under-nutrition

Variables	AOR	95% Confidence Interval
Age		
18 to 24	1.12	0.12 – 10.51
25 to 29	2.14	0.24 – 19.22
30 to 34	0.28	0.02 – 3.17
35 to 39	0.28	0.01 – 4.27
40 to 44	0.21	0.01 – 3.33
45 to 49	1	
Marital status		
Single	1.21	0.30 – 4.75
Separated	1.67	0.37 – 7.60
widowed	2.97	0.59 – 14.77
Married	1	
Education status		
No formal education	0.72	0.17 – 3.05
Primary education	0.82	0.19 – 3.56
Secondary education and above	1	
Religion		
Christianity	1.02	0.23 – 4.58
Muslim	1	
Alcohol use		
Yes	2.98	1.02 – 8.71
No	1	
Individual Dietary Diversity		
1-3 food groups (LDD)	11.2	2.52 – 49.40
4 and above groups (HDD)	1	
ART Length		
≤ 12 months	0.19	0.06 – 0.60
>12 months	1	

*Significance p<0.05

6. DISCUSSION

Results in this study showed the prevalence of under-nutrition was 52.3%. Moderate and mild under-nutrition was detected on 9.2% and 43.1% of respondents, respectively.

The prevalence of under-nutrition observed in this study, is higher than that of similar studies, conducted in Fillege Hiwot, prevalence 25.5% [18] conducted in Dilla, prevalence 12.3%, [19] carried out in Sub-Saharan Africa, prevalence was 10.3%. and a study carried out in Ethiopia found out under-nutrition prevalence was 26.6% [20].

Individual Dietary Diversity Score

Individual Dietary Diversity was significantly associated with under-nutrition, in that those who ate from 1-3 food groups, were more likely to become under nourished compared to those who ate from 4 groups and above (AOR=11.15, CI 2.52-49.40). This was in line with similar studies carried out by [21] at Dilla University referral hospital, Southern Ethiopia, and [22] in Ethiopia, which showed that those who had 4 and above dietary diversity food score, were less likely to become undernourished, compared to those who had 1-3 dietary diversity food score, surprisingly a similar study carried out by [20] had contradictory results in terms of Individual Dietary Diversity, which showed no significant association

between under-nutrition and Individual Dietary Diversity Score. This discrepancy could have been due to the way they assessed Individual Dietary Diversity (it was grouped as Low IDD < 2 food groups, and High IDD > 3 food groups).

A high proportion of the patients (57.7%) reported to have consumed less than four food groups, implying a poor or an inadequate dietary quality as defined by [23]. Lack of enough dietary diversity in the diet, is therefore a likely major contributory factor to inadequate intake of essential micronutrients.

Duration of Anti-retroviral Therapy

Duration of ART was significantly associated with under-nutrition, respondents who were on treatment for more than 12 months, were 81% more likely to be undernourished compared to those who were on treatment for less than 12 months, however this was not in agreement with similar studies that were carried out in North West Ethiopia [24], and Nepal [25]. This could have been due to the different ways, different studies categorized ART length. This particular study used a standard category of ART length (≤ 12 months, and > 12 months) from the UDHS, and other studies categorized up to 6 years. However a study by [26] in Northern

Ethiopia, and its findings were in agreement with this study. It found out that respondents who were on ART for longer time (> 12 months) were more likely to become undernourished, compared to those who were on treatment for ≤ 12 months, who were less likely to become undernourished.

Alcohol consumption

Respondents who drank alcohol were more likely to become undernourished (AOR=2.98, CI 1.02 – 8.71), this was in agreement with a studies done by [27, 28]. This lends support to a more recent study done by [27] indicating that chronic alcohol abuse is associated with immunosuppressive effects that exacerbate the HIV-related immune-suppression. This accelerates disease progression which can eventually result in malnutrition. This was also supported by Gregory et al., and other similar studies. This could be due to the well-established fact that alcohol use alters the metabolism of vitamins and minerals leading to poor nutritional outcomes [29, 30].

7. LIMITATIONS AND STRENGHTHS

The cross-sectional nature of the study limits the investigation into relationship between determinants and outcome of interest (BMI), limited funds and

resources to carry out the research effectively, and this had an effect on sample size (Power of the study), despite the above limitations, this study, had a high response rate (92%).

8. CONCLUSION

The findings revealed a very high prevalence of under-nutrition (52.3%), which is among HIV positive women attending TASO supported Public Health Facility, and the risk factors associated with under nutrition are Social-economic and demographic factors i.e. age, marital status, level of education, religion, income, and family size, lifestyle factors i.e. drinking alcohol, and smoking, Nutrition related factors i.e. 24 hour dietary diversity score, and medical factor i.e. ART length.

Nutritional education, management and nutritional support, should be key interventions aimed at improving the nutritional status of People Living with HIV/AIDS (PLWHA) during the course of care.

Acknowledgements

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