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Nutrition status of PLHIV at Narok County Referral Hospital

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Abstract
HIV virusand malnutrition are strongly interrelatedand greatlywidespreadin Sub-Saharan Africa. Nutrition is a strategicconstituentof comprehensive care for people living with HIV/AIDS (PLHIV). Deprivednutritional status may hurryup the advancementof AIDS-relatedinfections. A diverseand healthy diet has been powerfullylinkedwith nutrient sufficiencyand defermentin HIV/AIDSprogress. This study aimed to assess the nutrition status of PLHIV attending Narok County Referral Hospital A cross-sectional analytical study design was adopted to analyze the quantitative data. This constituted the 498 adult PLHIV aged 18 years and above attending the Comprehensive Care Clinic (CCC). A structured interviewer-administered questionnaire was used to collect data. In order to assess the nutritional status of PLHIV, Body Mass Index (BMI), Mid Upper Arm Circumference (MUAC), and Waist Hip Ratio (WHR) were used. The results showed that 5.8 % had moderate malnutrition while 5 % were suffering from severe malnutrition (MUAC), 29.5% were underweight while 10.5% were overweight (BMI) and for Waist Hip Ratio 89.5% females had an increased risk of non-communicable diseases (NCDs) compared to 49.2% of the males (WHR).These results indicate that while majority of the PLHIV are not underweight they are becoming overweight a situation that will expose them to non-communicable diseases (NCDs).= conclusion and recommendation.

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I. Introduction

Malnutrition is a globalpublic health challengein both children and adultsworldwide. Also, it is an obstructionto universalpoverty eradication, productionand economicgrowing. By eradicatingmalnutrition, it is projectedthat 32% of the internationalhealthloadwould beeliminated. Malnutrition ensuesdue to adisparityin the body, whereby the nutrientsneededby the body and the quantityutilizedby the body do not tally. There arenumerousvarietiesof malnutrition and these include two obviouscategories specificallyunder-nutrition and over-nutrition. Undernutrition exhibitsas wasting, lowweight for height (acute-malnutrition), stunting or low height for age (chronicmalnutrition), underweight or low weight for age, and mineral and vitamin deficienciesor excess. Undernourished PLHIV are at greaterdangerof decreasedoralconsumption, amplifiedmetabolicneeds, and reducedassimilationof nutrients. Diminishedoral consumptionmay result due oral thrush, esophageal candidiasis, depression, or anorexia. Fever intensifiesnutritional requirements as it risesthe body's use of nutrients (Alebel et al., 2019).Likewise, HIV-related intestinal mucosal destructionand diarrhoea can reducenutrient assimilation. The connectionbetween malnutrition and OIs in PLHIV is also bidirectional. A favorablynutritious diet is vitalto advancethe effectivenessof antiretroviral therapy (ART) taken by PLHIV and lowerits unfavorableside-effect(Gambo et al., 2022). Over-nutrition includes overweight, obesity and diet associatednon-communicable diseases (NCDs) such as diabetes mellitus, heart disease,certain typesof cancer and stroke. Anybodycan suffermalnutrition but the most susceptiblesetsdistressedare children, adolescents, women, people who are immune-compromised, or encounteringthe problems of poverty. The World Health Organization (WHO), indicates that 462 million adults are underweight, while 1.9 billion adults are overweight and/or obese(Dukhi, 2020).Ineffectiveimmune reactionmay be linkedto malnutrition as the principalrootof immunodeficiency internationally(Alebel et al., 2019).

Problem statement

Internationally, the frequencyof malnutrition amongstadultsoscillatesbetween 23 to 46%. As per the health and nutrition survey (HANES) data in sub-Saharan Africa, the incidenceof malnutrition amongstadults' ranges from 6 to 48%. In Africa, adults are not deemed animportant target for nutrition support, so the effectivenessof diversecategoriesof nutrition interventions has not been definedin this population(Ferede et al., 2022).Kenya faces a constant upsurgein communicable diseases (CD) like HIV/AIDS and malaria, includinggrowingoccurrenceof (NCDs) non communicable diseases hencea double burden of disease, this

spearheadsnon-adherence to ARVs which is relatedwith amplifiedill healthand deathas well as wasted healthcare wealth(Abdulaiet al., 2022). In Kenya there is establishedgrowingproportionsof overweight/obesity and diet-related non-communicable diseases (DRNCDs) in adults. A total of 28 per cent of adults aged 18–69 years are either overweight or obese, with the frequencyin females being 38.5 per cent and males 17.5 per cent. Aliketendenciesare noted when contrastingthe 2008–2014 KDHS. The percentageof females who were overweight or obese swelledfrom 25 per cent to 33 per cent and those who were obese raisedfrom 7 per cent to 10 per cent. The rateofoverweight or obesity is greaterin urban regions(43per cent) than in rural zones(26 per cent); among females with higher education (38 per cent) than with loweducation (18 per cent); and higher in women in thehighest wealth quintile (50 per cent) in comparison withthose in the leastwealth quintile (12 per cent).Regionswith high occurrenceof overweight/obesityare Nyeri, Kirinyaga and Mombasa, where nearlyhalf of the females of reproductive age (WRA) wereaffected(MOH, 2018).A research on Changes in Lipid Indices in HIV+ Cases on HAARTHIV establishedthat illpatients appear to suffer from dyslipidemia, particularlythose with hyperglycemia and thyroid dysfunction (Ji et al., 2019). Thisdisorder enhancespossibilitiesof untimelycoronary artery disease and heart attack. In Narok, malnutrition rates are equally high, the nutrition status of adults is not very clearly articulated as data is scanty and also, no much researches has been done in this area especially for adult PLHIV. However, available statistics for children below five years indicate that malnutrition is rampant in the area. Despite the many health measures taken, Narok county with a population of 1,157,873 is among 9 of the 47 counties that have a prevalence of acute malnutrition (stunting) above 30 per cent, a level categorized as 'very high' in public health significance by WHO and UNICEF(KDHS, 2014; MOH, 2018). The stunting levels in Narok County are at 32.9% (76,189) compared to 26% nationally, wasting levels are at 2.4% (5,558)., compared to 4% nationally and underweight is 11.6% (26,863) compared to 11% nationally (KDHS, 2014)

Keywords: Nutrition status, PLHIV, HIV.

II. Methodology

Study Design: A cross sectional analytical researchdesign was embracedin the study to analyze the quantitative data. The design was the most suitablefor this researchbecausethe variables under test cannot be influencedby the study; they were used as they are in their natural state.

Study Population: This included the 498 adult PLHIV above 18 years of age both males and females, provedto be HIV positive, appearingin the Comprehensive Care Clinic (CCC) at the Narok County Referral Hospital and who agreed on the informed consent to participate in this study. Adult patients attending the clinic for the first time, bed ridden or mentally disturbed were omitted.

Sample Size Determination: The requiredsample size Computationwas done by applyingthe Fisher formula [54] whereby n= $[z^2pq/d^2]$, Consequently, the total sample for the study was 110 + 11 = 121 participants. Purposive sampling was used to select Narok county referral hospital and the PLHIV attending the comprehensive care clinic at the hospital. Simple random sampling was usedto choosethe 121 respondents from the PLHIV. Every 4th person was nominatedfor the study in so as to have auniformrepresentation of both men and women in the sample (that is 498/121 =4).

Data Collection Tools: Primary data was key in this study as the investigatorsought to find out actualstatisticsfrom the focuspopulation. A researcher administered structured questionnaire was utilized. A 24-hour recall questionnaire was used to establishthe foods that the client had eaten within the past 24 hours. Food Frequency Questionnaire (FFQ) was utilizedto evaluatetheregularity, source and sufficiencyof the nutrientsthe client had eatenin a period of 7 days. A Focus Group Discussion, with about 8 to 10 personsthrough an open discussion by anexpertmoderator was accomplishedby use an FGD guidebookto guaranteereliabilityof the assortedFGD teams captured. A key informant guide qualitative in-depth interviews with the health workers at the CCC were held. Those who contributedincluded a clinician, nurse, lab technologist, nutritionist and a HIV testing counselor. An observation checklist was utilized to obtainmore factson the conditionof the client. The anthropometric International Journal of Sciences: Basic and Applied Research (IJSBAR) (2019) Volume 46, No 2, pp 13-30 20 form was obtained and utilized to documentthe height and the weight of the clients. This facilitatedrecording of the bodilypositionof clients records. In terms of Height using the height meter, weight using adult weight scale, MUAC using adult MUAC tape and a measuring tape for Waist – Hip Ratio.

Data Analysis: Data gatheredfrom open-ended questions wascorrected, coded and recordedinto a computer spreadsheet in a standard set-upto permitthe analysis of descriptive statistics and inferential statistics using SPSS 22.0 version computer package. Nutrisurvey computer package was also utilizedto analyze dietary intake data while WHO cutoff points were used to analyze participants' nutritional status. A body mass index of < 18.5, 18.6 – 24.9, 25 – 29 and > 30 computed as underweight, normal, overweight and obese nutritional status respectfully and controlled for sex and age of the patients. A MUAC of 0 – 21 cm denotedby a Red color on the measuring tape signifiessevere malnutrition, 21- 23 cm indicated by the Yellow color on the measuring tape

signifiesmoderate malnutrition and above 23 cm shown by Green color on tape signifiesnonexistenceof under nutrition for adults. The measures of central tendency and dispersion; mean median, mode and standard deviations were used to analyze descriptive statistics i.e. demographic and socioeconomics data. Anthropometric data analysis was done using mean and standard deviation for BMI, MUAC and WHR which were correlated with dietary intake, morbidity and social demographic variable in order to establish the relationship between the variables at a P value of P<0.

Ethical Considerations: Permissionwas sought from Kenyatta University Graduate School and Ethical Review Committee. The research authorizationwas obtainedfrom the National Commission of Science and Technology (NACOSTI) and the clearancefrom Narok County Referral Hospital administration. An informed consent was attainedfor all respondents before testing and launchingtheresearch. In the consent form profitsof the researchwere clarifiedand risks containedin involvementin the researchexpoundedto the participants.Privacyof the statisticsto be gatheredfrom the clients wasguaranteed. Participation in the study was voluntary and theparticipants had the permissionto leaveat any stage of the researchwithout losing the assistancesfrom the therapyfacility. A number was assignedto each respondent and at no time were their names revealedtoanybody. Respondents confidentiality and secrecywas secured by safeguardingthat no names showedon the report. Any measurementswere done in a secludedconsultationarea.

III. Results

A. Demographic and Socio-Economic Characteristics of Research Participants

Demographic aspectswere considered for this research papersincethey facilitatedto definethe social characteristics of the participants. This segmentdeliberatedon the connectionof the participants to the family ahead, the age, gender, education level, marital status, religion and level of income.

Table 1. Distribution of respondents by demographic characteristics

Variable	Description	Freq (n=120)	Percentage
Age	18 – 27 years	4	3
	28 – 37 years	41	34
	38 - 47 years	42	35
	Above 48 years	33	28
	Total	120	100
Relationship to household head	Self	105	87.5
	Spouse	5	4.2
	Grand Children	1	0.8
	Others	9	7.5
	Total	120	100
Gender	Male	63	52.5
	Female	57	48.5
	Total	120	100
Marital status	Single	21	17.5
	Married	51	42.5
	Polygamous	1	1
	Separated	24	20
	Widowed	19	16
	Cohabiting	4	3
	Total	120	100
Religion	Catholic	50	42
	Protestant	66	55
	Adventist	1	0.8

	Muslim	1	1.6
	Traditionalist	1	0.8
	Total	120	100

The research aimed todeterminethe age of the participants and the outcomesexposethat majority of the clientstotaled 42 (35%) ageranged around 38-47 years, 41 (34%) were in the range of 28-37 years and beyond48 years stoodat 33 (28%). The outcomesillustratethat majority 105(87.5%) of the participants were the heads of households. On sexof the clients the observations revealthat 52% were male and 48% female. The outcomesin Table 2displaythat most of the participants 51 (42.5%) werewedded, 24 (20%)separated, 21 (17.5%)singles, and 19 (16%) widowed. The research tried to establishif religion has an effecton the nutritional status of the PLHIV. The research revealsthat the majorityof the participants 66 (55%) belonged to the Protestants religion and 50 (42%) Catholics.

Table 2: Distribution of Participants by Socio-Economic Characteristics

Variable	Description	Freq. (n=120)	Percentage
Education level	None	14	11.7
	Primary	67	55.8
	Secondary	35	29.1
	Tertiary	4	3.4
	Total	120	100
Occupation	Unemployed	7	5.8
	Farmer	12	10
	Business	26	21.7
	Salaried	11	9.2
	Casual	59	49.2
	Others (house wives etc.)	24	3.3
	Total	120	100
Income (Kshs)	0-1000	16	13.3
	1001-5000	45	37.5
	5001-10000	31	25.8
	10001-20000	20	16.7
	Over 20,000	8	6.7
	Total	120	100

Most of the participants that is 55.8% attained primary education and merely2.5% accomplishedtertiary education. concerning occupation, majority of the participants 49.2% were casual laborers with merely3.3% either joblessor without formal work. The research also aimed to establish the impactof income on the nutritional uptake by PLHIV. Majority households 37.5% had very low income level of between Kshs 1,000 to Kshs 5,000. Whereas6.7% earnedaboveKshs 20,000.'*Our ability to seek medical assistance when we are sick is also affected by the lack of finances'* a respondent said '*many of our colleagues suffer a lot at home because they come from very poor families and they are not able to get the required care in terms of food, medication and even movement'*.

Nutrition status

Nutritional status of PLHIV attending Narok County Referral Hospital

So as to evaluatethe nutritional status of PLHIV, BMI, MUAC, and Waist Hip Ratio (WHR) wereutilized. These methods are usually utilizedto measurepatients' nutritional status for approvalto admission and discharge from HIV associatednutritional programsfor instanceFood by Prescription (FBP) and Integrated Management of Malnutrition (IMAM).

Nutritional Status by Mid Upper Arm Circumference (MUAC)
The researcher adopted the limitsof magnitudeendorsedby (UNICEF, 2009) for adults MUAC of ≤ 21 cm which representssevere malnutrition, 21- 23 cm representsmoderate malnutrition and ≥ 23 cm representsnormal nutrition for adults. These findings are presented in Table 3 and Figure 1.

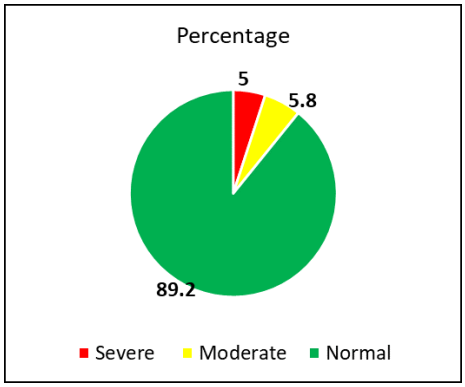

Figure 1

Table 3: Nutritional Status by Mid Upper Arm Circumference (MUAC)

Variable	Description	n=120	Percentage
MUAC cut off	< 21 cm Severe Malnutrition	6	5
	21 – 23 cm Moderate Malnutrition	7	5.8
	>23 cm Normal Nutrition Status	107	89.2
Total		120	100

Source: RDA Reference UNICEF, 2009

The indication is that 89.2% of the clientsattained the acceptedthreshold of > 23 cm showing a normal level of muscle and fats which suggeststhey were safe. Merely5.8 % had moderate MUAC level of 21 – 23 cm and the remainder5 % had severe malnutrition as exhibitedby the low MUAC level of <21 cm.

4.4.2 Nutritional Status by Body Mass Index (BMI)
The participants' BMI was calculatedand the outcomesexhibitedin Table 4. These statistics were utilizedto advocatethat the PLHIV begrantedappropriatenutrition interventions like ready to use therapeutic food, ready to use supplementary food or flour-based food based on BMI classification. The acceptable threshold for consideration as having a normal body mass index is one is between 18.5 – 24.9 as espousedby WHO (2004).

Table 4: Distribution of Respondents by Nutritional Status by BMI

Variable	Description	Freq (n=120)	Percentage
Underweight	<18.5	35	29.5
Normal weight	18.5 – 24.9	72	60
Overweight	25 – 29.99	13	10.5
Obesity	>30	0	0
Total		120	100

Source: RDA Reference UNICEF, 2009

The majority of the participants that is 60.0 % exhibitednormal weight as their BMI was between 18.5 – 24.9, followed by 29.5% who exhibited an underweight measurement BMIbelow or< 18.5 and 10.5% were overweight with a BMI of 25-29.99.

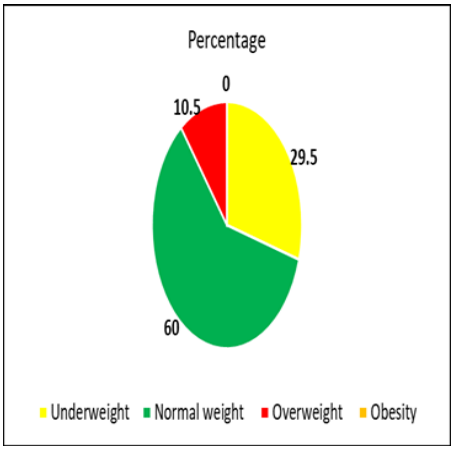

Figure 2

Nutritional status by Interpretation of the Waist Hip Ratio (WHR)

The waist hip ratio is extremelycrucialin assessingthe health status of a PLHIV. The stipulatedthreshold cut off points for males and women are; < 0.8 as normal for women, > 0.8 – 0.88 as increased risk and > 0.88 as high risk for females while for men cut off points of < 0.9 as normal health, > 0.9-1.02 as increased risk and >1.02 as high risk. This figures agree with the Kenya National Action Plan 2018-2022 which shows that females are more at risk of non-communicable diseases (NCDs) (MOH, 2018). The WHR are given in Table 5 and figure 3.

The results show that most of the male patients 50.8% had a normal Waist Hip Ratio of < 0.9 cm while only 49.2% had an increased risk WHR of > 0.9-1.02.

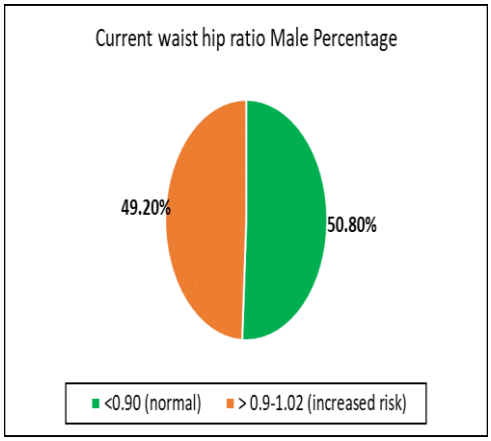

Figure 3

Table 5: Nutritional Status by Waist Hip Ratio for Males

Current waist hip ratio	Males	
	n=63	Percentage
<0.90 (normal)	32	50.80%
> 0.9-1.02 (increased risk)	31	49.20%
Total	63	100.00%

Source: RDA Reference UNICEF, 2009

The research also showed that among the females'majority that is 89.5% exhibited a WHR of 0.8 – 0.88 meaningthey had an elevated risk for Waist Hip Ratio, a mere 10.5 % exhibiteda normal WHR.

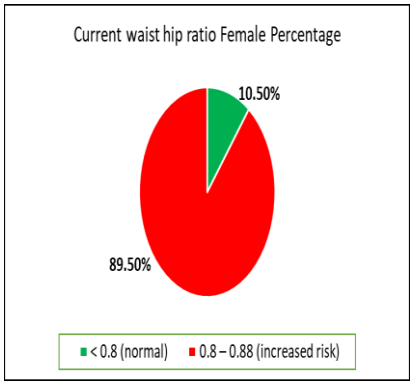

Figure 4

Table 6: Nutritional Status by Waist Hip Ratio (WHR) for Females

Current waist hip ratio (WHR) for females	Female	
	n=57	Percentage
< 0.8 (normal)	6	10.50%
0.8 – 0.88 (increased risk)	51	89.50%
	57	**100.00%**

RDA Reference UNICEF, 2009

IV. Discussion

The outcomeshave intimatedthat the men PLHIV visiting the Comprehensive Care Clinic (CCC) at Narok County Referral Hospital stoodat a higher figure than the women. This meansthat the men were in a healthierpointin maintaining their routine checkups evaluatedagainst women. Also slightly in excess ofhalf of theparticipants had low primary education in comparison to merelya limitednumber attaining tertiary and college education.Protestants were half of the PLHIV and half were in nuclear marriages in comparison to justone fractionin polygamous marriages. The maximumshockof the pandemicis sufferedat the familylevel, because socio-economic dynamicsmergewith socio-cultural and epidemiological factors toimpactfrequencyof HIVillness. The indications from measures of central tendency for the socio- economic characteristics demonstratesthat HIV afflictionis higheramongstmarried adults.

Majority of the participants, approximatelyhalf, were casual laborers with justa very minorproportionwith formalremuneration, as shown by the income level that they secured. A third of the participantsreceivedbelow Ksh 5,000 in comparison to aninsignificantfractionthat receivedabove Ksh 20,000. Monthly revenuecan be a compellingforecasterof diet diversity amongstHIV clients(Onyango, 2014). Since majority of the participantsare nettinglower than Ksh 5000, it indicates a challenge money-wisewhich distressestheir wellbeingand thusnutritional intake. The research indicated that eighty percent of the participantsconstantlyeat supper in comparison to other foodper day; lunch was occasionallyeaten by a fewof the participants with majority not eating snacks at all. Amongstthe side-effects enduredby the participants, vomiting came first and then nausea.

Nutrition Status

The nutrition status of PLHIV was evaluatedby use BMI, MUAC, and WHR. The three indicatorsaidin determining the stageof malnutrition status amongstthe clients. The thresholds chosen as per recommendations by (UNICEF, 2009; MOH, 2010). The cut off points for MUAC was ≤ 21 cm signifyingsevere malnutrition for adults, 21- 23 cm signifyingmoderate malnutrition and ≥ 23 cm signifyingnormal nutrition for adults. The outcomesrevealedthat virtuallyall of the participantssustainedthe acceptedThreshold of > 23 cm. Two thirds of participantswere normal weight astheir BMI ranged between 18.5 – 24.9. Half of the men PLHIV exhibiteda normal Waist Hip Ratio of < 0.9 cm whereasamong the femalesnearlyall possesseda WHR > 0.8 revealingaextensivelyswelledWaist Hip Ratio. Majority of PLHIVs who took part in the researchwere normal in terms of MUAC howeverBMI indicatedthat approximatelya third was malnourished, butWHR amongstthe malesprovedthat almosthalf had intensifieddangerand for femaleswho possesseda normal BMI and MUAC, WHR was multipliedgreatly. It's vitalto mentionat this juncturethat nutritional status was only calculatedby use of MUAC, BMI and WHR and not by chemical indicators of micronutrient status.

V. Conclusion

Many of the participantswere within the requiredthreshold of > 23 cm (MUAC) and beyondrevealingand thus not malnourished and two thirds had normal BMI oscillatingbetween 18.5 – 24.9. A third were underweight of the total with a BMI of < 18.5 althougha few were overweight. Approximatelyhalf of the men PLHIV exhibiteda normal Waist Hip Ratio of < 0.9 cm buta furtherhalf possessedan amplifiedrisk WHR of > 0.9-1.02. Many of the womenborea WHR of 0.8 – 0.88 representingan amplifiedcentral obesity, justa few displayeda normal waist.Nevertheless, it's essentialto remarkthat elevatedWHR may also showvery narrow hips and not central fat distribution. Generally,the nutrition status of the PLHIV was satisfactoryand revealedthat they strivedto safeguardproper nutrition. This is backedby their descriptionsthroughoutFGDgatherings.Nevertheless, there werefactson WHR amongstthe women that displayedthat they were at escalatedrisk regardingoverweight and obesity.

VI. Recommendations

The outcomesexhibita tendencyto an overweight settingthat will subjectPLHIV to non-communicable diseases (NCDs). Additionalenergiesmustbe focusedat acceptablesustenance of the normal waist hip ratio (WRH) and at the similarly more research on this area will help enable the PLHIV to access updated knowledgeto evadethe dualloadof malnutrition.The outcomesrevealthat there is a necessityfor extraexaminationin so as to determinewhateverother issuesthat upsetnutritional status of adult PLHIV.

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