Dietary practices and nutritional status of elderly persons in post-conflict: A cross-sectional study of Northern Uganda

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Abstract

Background

Malnutrition remains a problem in older populations globally. Most older persons do not meet the required dietary intake with the majority consuming more of carbohydrate-based foods and vegetables. The current study therefore aimed at assessing the dietary practices, nutritional status and associated factors among elderly persons in the post-war setting of Gulu district.

Methods

This was a cross-sectional study among elderly persons ≥ 60 years residing in Bungatira Sub-County, Aswa County-Gulu District. The study used a multi-stage sampling procedure. Nutritional status was measured using the Mini Nutrition Assessment – Short Form (MNA-SF) Analysis was done in STATA 16 using modified Poisson regression model. Variables with a p-value of 0.05 at multivariable analysis were considered as factors associated with malnutrition.

Results

The study enrolled 141 participants with a median age (IQR) of 71(64,79) years. Majority of the

respondents, 96(68.1%) were female and 72(51.1%) reported to be widows or widowers. Nearly three quarters, 104(73.8%) were involved in agriculture as a source of livelihood and 64(45.4%) had no education background. The prevalence of malnutrition was 53.9% [95%CI: 45.6 – 62.0]. The study found that 47(33.6%) participants ate Sorghum and its products daily and 64(45.7%) ate it 1-4 times per week. Millet was eaten by 62(45.9%) participants 1-4 times a week while maize and its products was eaten by 56(40.6%) 1-2 times monthly. We found that increasing age (aPR=1.02, 95%CI =1.00–1.04, p-value=0.022), having primary education (aPR=1.59, 95%CI=1.06–2.38, p-value=0.026), staying <5km away from the health facility (aPR=1.60, 95%CI=1.18–2.16, p-value=0.003) and a DDS ≥60 (aPR=0.70, 95%CI=0.53–0.94, p-value=0.018) were significantly associated with having malnutrition.

Conclusion

Majority of the participants were malnourished. Elderly persons were found to have a decline in food intake in the past months; and age, education, dietary diversity and distance from healthcare facility were the factors that influenced nutritional status. There's need for age-appropriate elderly health education programs. Elderly programs should aim at bringing healthcare services nearer to the elderly through community and home-based approaches.

Background

Malnutrition remains a problem among elderly populations worldwide with a prevalence reported at 22.8%[1] globally. The World Health Organization (WHO) through its programme, "The Decade of Healthy

Ageing 2020–2030" has prioritized healthy aging and the needs of older people[2]. However, undernutrition continues to stifle elderly persons. Across Africa, the prevalence ranges from as low as 2.2 to 77.3%[3] in various settings. Malnutrition in Uganda varies across regions with estimations varying between 6 and 52% on various scales of measurement[4, 5].

Dietary practice studies among the elderly show that most older persons do not meet the required food intake[6] with majority consuming more of carbohydrate-based foods and vegetables[4, 6, 7]. The practices have been linked to financial constraints and health challenges[8, 9]. Location of residence[10], age, education background, and underlying conditions[9, 11] have also been seen to influence the nutritional status of this population. Other factors identified include number of meals, drug prescriptions, and individual nutrition perspectives [4].

In Uganda, minimal research has been done on nutrition in this population[4, 5] and the household dietary survey that was done in northern Uganda last year focused on the younger population[10]. The Northern region of Uganda has suffered instability arising from a 20 year (1984–2008) civil war. This instability precipitated prolonged food insecurity and inadequate access to healthcare services which had a profound impact on the affected communities. Whereas previous nutrition research from the region has highlighted poor nutrition status, especially among children under five and pregnant women[10, 12, 13], there is paucity of data on the nutritional status of the elderly in these communities. It is important to understand this population's dietary practices, nutritional status and the associated factors so as to inform the design strategies to curb malnutrition among the elderly. This study therefore aimed to assess the nutritional status of elderly persons and the associated factors in Gulu district in Northern Uganda.

Methods

Study setting

The study was carried out in Bungatira Sub County in Aswa County, Gulu District in Northern Uganda.

Study design and population.

This was a cross-sectional study conducted among elderly persons aged 60 years and above.

Sample size estimation

The study sample size was calculated using the Cochran, (1963) formula of sample size calculation – $[(z^2pq)/e^2]$ using a Zα corresponding to 95% level of confidence (z) of 1.96, prevalence of malnutrition among the elderly (p) of 6.0%[4], level of precision (e) of 0.05, q = (1-p) = 94% and a design effect of 1.5 to cater for clustering. The desired sample size, n for this study was 143 after correcting for 10% non-response.

Sampling and data collection procedure.

The study used a multi-stage sampling procedure. There are two Counties (Aswa and Gulu municipality) that constitute Gulu district. Aswa was purposively selected because it is the rural area of the district. Aswa is made up of Palaro, Awach, Bungatira, Paicho, Unyama and Paicho sub-counties from which Bugantira was randomly selected by lottery. In Bugantira sub-county, the sample size was divided equally among the parishes that make up Bugantira sub-county. These parishes include Agonga, Punena, Pabwo, Oitino, Laliya, Laroo, and Atiyabar parish. Parishes were selected due to the sparse distribution of households in villages in Bungatira Sub-County. The list of households was obtained from the local chairperson (LC) II's from which the households were randomly selected using simple random sampling using the table of random numbers. Stage three involved picking the first household and this was done by closing eyes and randomly pointing a pen on the list of households. To choose the second household, the fourth household after the first on the list was considered until the required sample size was reached in each parish. Households that had no person of 60 years and above or were not available at the time data collection were replaced. For households that had more than one person ≥ 60 years, one was randomly selected using simple random sampling.

Study variables and tools.

The outcome variable was malnutrition which was measured using the Mini Nutrition Assessment – Short Form (MNA-SF)[14]. The MNA-SF is the short version of the original Mini Nutrition Assessment[15]. It has six questions covering food intake, weight loss in last 3 months, mobility, history of psychological distress in last 3 months, neuropsychological problems, and BMI or calf circumference. The tool has an overall score of 14 categorized as "0–7" malnourished, "8–11" at risk of malnutrition and "12–14" normal nutritional status. For this study, the outcome was dichotomized into ≤ 7 as malnourished and > 7 as not malnourished.

Data on the regularity of food consumption using the food frequency questionnaire (FFQ) was collected. The tool utilized the recommended twelve food groups[16] which include cereals, root and tubers, green leafy vegetables, fruits, meat, eggs, fish, milk, and its products and legumes, nuts, and seeds. The list of foods was modified to include only those suited for Northern Uganda. Participants were asked to report on how often they had consumed certain foods in the past one year. The responses adapted from previous studies[10] were captured on a 5-point Likert scale; 5 "daily", 4 "5–6 times per week", 3 "1–4 times per week", 2 "1–2 times per month", 1 "1–4 times a year" and 0 "Never". From this scale, a dietary diversity score (DDS) was computed for each participant by aggregating the scores on each food item. The independent variables included demographics of age, sex, marital status, education level, household size, source of income, income level and DDS. Other variables studied included distance from health facility, satisfaction with health care and availability of nutritional services at the facility.

Statistical analysis

Data was analyzed using STATA 16 (Stata Corp, College Station, TX, USA). Means and standard deviations (SD) were reported for normally distributed data while medians and interquartile ranges (IQR) were reported where data was skewed in addition to frequencies and percentages for categorical

variables. To determine the prevalence of malnutrition, the number of participants who scored ≤ 7 on the MNA-SF tool was divided by the sample size. Adjustment for clustering was not done during analysis because we found the design effect to be one. Models were built using the modified Poisson regression model with prevalence ratios (PR) reported as the measure of association. The study considered a level of significance of 5% and confidence level (CI) of 95%. Variables were assessed for interaction using the chunk test and for confounding using the change in PR between the adjusted and the crude models. Variables with a p-value of 0.2 at bivariate analysis were considered for multivariable analysis. Variables that were significant (p-value < 0.05) at multivariable analysis were considered as factors associated with malnutrition.

Results

Participant characteristics

The study enrolled 141 elderly persons with a median age (IQR) of 71(64,79) years with a response rate of 98.6%. Majority of the respondents, 96(68.1%) were female and 72(51.1%) of all participants reported to be widows or widowers. Nearly three quarters, 104(73.8%) were involved in agriculture as a source of livelihood. Sixty-four, 64(45.4%) had no education, refer to (Table 1) for details.

Table 1
Socio-demographic characteristics of study participants (n = 141)

Variable	Categories	Frequency (n)	Percentage (%)
Sex	Male	45	31.9
	Female	96	68.1
Median age (IQR) in years [71(64,79)]	< 71	64	45.4
	≥71	77	54.6
Marital status	Single/ Divorced/separated	5	3.6
	Married	64	45.5
	Widow/widower	72	51.1
Religion	Christian	134	95
	Islam	4	2.8
	Traditionalist	3	2.1
Occupation	Agriculture	104	73.8
	Civil/public servant	4	2.8
	Casual labor	15	10.6
	Business	10	7.1
	Other	8	5.7
Median number (IQR) of people in the household 6(4,9)	< 6	49	34.8
	≥ 6	92	65.3
Education level	None	64	45.4
	Primary	54	38.3
	Secondary	13	9.2
	Tertiary	10	7.1
Average monthly household income	< 120000	89	63.1
	121000–234000	41	29.1
	235000–400000	8	5.7
	401000–750000	3	2.1
Dietary diversity score (DDS)	< 60	71	50.4

Variable	Categories	Frequency (n)	Percentage (%)
	≥60	70	49.7

Prevalence of malnutrition using the Mini nutrition assessment short form (MNA-SF)

The prevalence of malnutrition was 53.9% [95%CI: 45.6–62.0] and more than half of the respondents, 87(61.7%) had a moderate decrease in food intake as indicated in (Table 2).

Table 2. Nutritional status of elderly persons using the MNA-SF (n=141)

Variable	Frequency (n)	Percentage (%)
Malnutrition	65	46.1
No (not malnourished)	76	53.9
Yes (malnourished)		
Has food intake declined over the past months	21	14.9
Severe decrease in food intake	87	61.7
Moderate decrease in food intake	33	23.4
No decrease in food intake		
Involuntary weight loss in the last 3 months	18	12.8
Weight loss greater than 3kg	101	71.6
Does not know	10	7.1
Weight loss between 1 and 3kg	12	8.5
No weight loss		
Current mobility	3	2.1
Bed or chair bound	4	2.8
Able to get out of bed/chair, but does not go out	134	95.0
Goes out		
Has suffered psychological stress or acute disease in the past 3 months	33	23.7
	106	76.3
Yes		
No		
Neuropsychological problem	18	12.8
Severe dementia or depression	53	37.6
Mild dementia	70	49.7
No psychological problems		
Body Mass Index (BMI)	57	40.4
BMI less than 19	31	22.0
BMI 19 to less than 21	28	19.9
BMI 21 to less than 23	25	17.7
BMI 23 or greater		

Dietary practices of the study participants

The study identified that 47(33.6%) participants ate Sorghum and its products daily and 64(45.7%) ate it 1–4 times per week. Millet was eaten by 62(45.9%) participants 1–4 times a week while maize and its products was eaten by 56(40.6%) people 1–2 times a month. Regarding consumption of root tubers, cassava was consumed by 30(21.4%) people daily and 56(40.0%) ate it 1–4 times a week. White sweet potatoes were consumed by 64(46.0%) participants 1–4 times a week. 'Boo' was the commonest green leafy vegetable, eaten by 119(84.4%) participants while 'Otigo' was eaten by 117(83.0%) 1–4 times per week. In addition, 108(77.7%) participants consumed pigeon peas (Lapena) while 93(68.4%) consumed beans 1–4 times a week respectively. Vitamin A fruits, meats, and milk products were the least consumed, refer to (Table 3).

Table 3
Dietary practices of elderly persons in Northern Uganda

Type of food	Frequency of consumption, n (%)					
	Daily	5-6times /week	1-4times /week	1-2times /month	1-4times /year	Never
Cereals						
Sorghum & its products (n = 140)	47(33.6)	11(7.9)	64(45.7)	13(9.3)	5(3.6)	0(0)
Millet & its products (n = 135)	11(8.2)	5 (3.7)	62(45.9)	26(19.3)	28(20.7)	3(2.2)
Maize & its products (n = 138)	16(11.6)	27(19.6)	56(40.6)	14(10.1)	19(13.8)	6(4.5)
Rice (n = 131)	0(0)	2(1.5)	25(19.1)	61(46.6)	32(24.4)	11(8.4)
Wheat & its products (n = 119)	6(5.1)	2(1.7)	16(13.6)	52 (44.1)	16(13.6)	26(22.0)
White roots & tubers						
Cassava (n = 140)	30(21.4)	9 (6.4)	56(40.0)	38 (27.1)	5(3.6)	2(1.4)
White fleshed sweet potatoes (n = 139)	0(0)	6 (4.3)	64(46.0)	40 (28.8)	24(17.3)	5 (3.6)
Others (Irish potatoes & yams) (n = 100)	0(0)	0(0)	1 (1.0)	8 (8.0)	34(34.0)	34(34.0)
Dark green leafy vegetables						
Boo	2(1.4)	0(0)	119(84.4)	11(7.8)	8(5.7)	1(0.7)
Otigo	2(1.4)	0(0)	117(83.0)	12(8.5)	8(5.7)	2(1.4)
Akeyo (n = 135)	0(0)	0(0)	15(11.1)	20(14.8)	89(65.9)	11(8.2)
Malakwang (n = 135)	0(0)	0(0)	28(20.7)	37(27.4)	61(45.2)	0(0)
Dodo (Amaranthus) (n = 134)	0(0)	0(0)	22(16.4)	33 (24.6)	70(52.2)	9(6.7)
Pumpkin leaves (n = 129)	0(0)	0(0)	15(11.6)	20(15.5)	76(58.9)	18(14.0)
Egg plants (n = 137)	1(0.7)	1(0.7)	41(30.2)	27(19.9)	60(44.1)	6 (4.4)
Vit.A rich vegetables & tubers (orange sweet potatoes, pumpkin, carrot) (n = 130)	1(0.8)	0(0)	4(3.1)	16(12.3)	96(73.9)	13(10.0)
Cabbage (n = 137)	1(0.7)	1(0.7)	44(32.4)	34(25.0)	53(39.0)	3(2.2)

Type of food	Frequency of consumption, n (%)					
	Daily	5-6times /week	1-4times /week	1-2times /month	1-4times /year	Never
Cereals						
Vitamin A rich fruits						
Ripe mangoes	2(1.4)	2(1.4)	3(2.1)	1(0.7)	132(93.6)	1(0.7)
Ripe pawpaws (n = 131)	3(2.3)	1(0.8)	36(27.5)	49 (37.4)	37(28.2)	5(3.8)
Other fruits (passion fruits, Tangarine, Avocado, pine apple, oranges, jack fruit, cwaa, sweet bananas, watermelon, guavas) (n = 133)	3 (2.3)	3 (2.3)	38(28.6)	51(38.4)	31 (23.3)	7(5.3)
Fresh meats						
Beef (n = 135)	0(0)	0(0)	14 (10.4)	60 (44.4)	56 (41.5)	5 (3.7)
Chicken (n = 127)	0(0)	0(0)	9 (7.1)	33(26.0)	69 (54.3)	16(12.6)
Goat (n = 108)	0(0)	0(0)	7 (6.5)	14 (13.0)	40(37.0)	47(43.5)
Others (duck, game, insects-white ants, termites, grasshoppers) (n = 128)	0(0)	0(0)	0(0)	4(3.1)	111(86.7)	13(10.2)
Eggs (n = 108)	1 (0.9)	0(0)	14 (13.0)	15 (14.0)	26 (24.1)	52(48.2)
Fish						
Mukene (n = 134)	8(6.0)	16 (11.9)	90(67.2)	14 (10.5)	3 (2.2)	3 (2.2)
Tilapia (n = 131)	0(0)	0(0)	14(10.7)	20 (15.3)	75 (57.3)	22(16.8)
Milk & its products (n = 103)	5 (4.9)	1 (1.0)	15(14.6)	10 (9.7)	43(41.8)	29(28.2)
Legumes, nuts and seeds						
Beans (fresh and dried) (n = 137)	5 (3.7)	21 (15.3)	92(67.2)	11 (8.0)	2 (1.5)	6 (4.4)
Pigeon peas (Lapena) (n = 139)	5 (3.6)	10 (7.2)	108(77.7)	11 (7.9)	3 (2.2)	2 (1.4)
Sesame/simsim (paste, seeds) (n = 136)	8 (5.9)	25(18.4)	93 (68.4)	6 (4.4)	4 (2.9)	0(0)

Type of food	Frequency of consumption, n (%)					
	Daily	5-6times /week	1-4times /week	1-2times /month	1-4times /year	Never
Cereals						
Ground nuts (paste, powder, sauce, seed) (n = 136)	5 (3.7)	25(18.4)	81(59.6)	14 (10.3)	9(6.6)	2(1.5)

Factors associated with malnutrition among the elderly.

The study found that increasing age (aPR = 1.02, 95%CI = 1.00–1.04, p-value = 0.022), having primary education compared to having no education (aPR = 1.59, 95%CI = 1.06–2.38, p-value = 0.026), staying < 5km away from the health facility compared to staying more 5km away (aPR = 1.60, 95%CI = 1.18–2.16, p-value = 0.003) and a DDS ≥ 60 (aPR = 0.70, 95%CI = 0.53–0.94, p-value = 0.018) were significantly associated with having malnutrition as pronounced in (Table 4).

Table 4
Bivariate and multivariable analysis of factors associated with malnutrition among the elderly persons in Northern Uganda (n = 141).

Characteristic	Malnourished n(%)	cPR	95%CI	p-value	aPR	95%CI	p-value
Sex	**44(45.8)**	**1**	**1.16–2.07**	**0.003**	**–**	**–**	**–**
Female	**32(71.1)**	**1.55**					
Male							
Median age in years		1.01	0.99–1.03	**0.188**	1.02	1.00–1.04	**0.022**
Marital status	31(43.1)	1	0.65–2.99	0.396	–	–	–
Widow/widower	3(60.0)	1.39		**0.010**			
Single/ Divorced/separated	42(65.6)	1.52	1.11–2.10				
Married							
Religion	73(54.5)	1	0.34–2.48	0.677			
Christian	2(50.0)	0.918		0.984			
Muslim	1(33.3)	0.612	0.12–3.07				
Traditionalist							
Occupation	61(58.7)	1	0.08–2.36	0.329	–	–	–
Agriculture	1(25.0)	0.43		0.589			
Civil/public servant	12(52.2)	0.89	0.58–1.36	**0.093**			
Casual labor	2(20.0)	0.34	0.10–1.19				
Business							
# of people in the household	26(53.1)	1	0.71–1.35	0.885			
≥ 6	50(54.4)	0.98					
< 6							
Education level	23(35.9)	1	1.62–6.45	**0.001**	1.59	1.06–2.38	**0.026**
None	38(70.4)	3.23		**0.052**	1.43		0.202
Primary	8(61.5)	2.69	0.99–7.26	0.720	1.20	0.83–2.48	0.456
Secondary	7(70.0)	1.45	0.19–11.27			0.75–1.92	

Characteristic	Malnourished n(%)	cPR	95%CI	p-value	aPR	95%CI	p-value
Sex	**44(45.8)**	**1**	**1.16–2.07**	**0.003**	**–**	**–**	**–**
Female	**32(71.1)**	**1.55**					
Male							
Tertiary							
Av. monthly household income	62(69.7)	1	0.23–0.65	**< 0.001**	–	–	–
< 120000	11(26.8)	0.39	0.12–1.21	**0.098**	–	–	–
121000–234000	2(25.0)	0.36	0.10–2.40	0.370			
235000–400000	1(33.3)	0.48					
401000–750000							
Availability of nutritional services at the health facility	72(53.3)	1	0.60–3.17	0.451			
No	4(66.7)	1.38					
Yes							
Distance from health facility	31(73.8)	1	1.19–2.28	**0.002**	1.60	1.18–2.16	**0.003**
> 5km	13(48.2)	1.65	0.67–1.73	0.764	1.24	0.83–1.92	0.329
< 5km	30(44.8)	1.07					
5km							
Satisfaction with healthcare services	62(57.4)	1	0.17–1.04	**0.062**	–	–	–
Yes	8(36.4)	0.42					
No							
Dietary diversity score (DDS)	44(62.0)	1	0.54–1.01	**0.058**	0.70	0.53–0.94	**0.018**
< 60	32(45.7)	0.74					
≥ 60							

Discussion

The aim of this study was to assess dietary practices and nutritional status of elderly persons in the post-conflict context of Northern Uganda. The study found the prevalence of malnutrition at 53.9%, with more than half (61.7%) of respondents reporting a moderate decrease in food intake in past months. The biggest proportion of the elderly mainly ate sorghum, millet, and maize products, beans, and pigeon peas. Increasing age, having primary education compared to having no education, staying within < 5km from the health facility, and a dietary diversity score ≥ 60 were significantly associated with having malnutrition.

This study found majority of the participants to be malnourished. The prevalence similar to that reported from other settings elsewhere that reported prevalence of up to 54%[9, 17]. However, the current study reports a slightly higher prevalence than the 33.3% reported by a study from Uganda[5]. Additionally, some other studies elsewhere have also reported a much lower prevalence of malnutrition[18, 19]. The discrepancy may be due to the differences in tools used to measure malnutrition. The current study used the short form of MNA tool while the previous studies used BMI and the longer version of the MNA tool. Nonetheless, the comparatively high prevalence of malnutrition in the current study could be a reflection on the food insecurity in this region and a need for nutritional and food relief programs among the elderly persons.

In the current study, participants mainly consumed starchy cereals, legumes and tubers. Animal products and fruits were least consumed as previously reported from other household surveys in northern [10] and central [4] Uganda. This could be explained by the fact that most people are farmers[10] and agriculture was the commonly practiced occupation even in our study. But also, it suffices to mention that the most consumed foods – sorghum, millet, *Boo* and *Otigo* are the staple foods of Northern Uganda[20]. Hence, ease of access could be one of the reasons for the routine consumption of staples by the elderly persons. But also, majority of the participants barely had income. Perhaps they couldn't afford to purchase the other recommended nutritious foods which they don't grow. Nevertheless, the consumption of carbohydrate-rich meals with a plant-based protein and minimal or no micro-nutrient foods is a common trend in Uganda[21].

The study found that malnutrition was likely to be more prevalent among older respondents compared to the younger elderly persons. This may be explained by the decreasing taste for food and preferences over time among elderly persons, which eventually affects the intake of nutrients hence infringing on their nutritional health. Our finding concurs with findings elsewhere[3, 17, 18]. Contrary to previous studies[4, 9, 17, 19], having some education background did not protect the elderly against malnutrition. Education empowers people with knowledge including appropriate dietary practices which may enable them make proper nutrition-related choices[10] hence minimizing the chances of being undernourished. However, the discrepancy in the current findings may be attributable to the effects of the war on the cognitive functioning like memory of these survivors[22, 23]. The diminished memory leaves minimal or no difference in nutrition comprehension between participants that ever had an education and those who didn't. This highlights a need for elderly health promotion programs in post-conflict settings. But also, although the study was powered enough to answer the study objectives, the small sample size could

have hindered detection of some probable associations. We recommend future studies to consider bigger samples.

Furthermore, the current study found that people who were residing within 5km radius from a health facility were more likely to be malnourished contrary to what was reported in Rwanda[24] where improved healthcare accessibility reduced the likelihood of malnutrition. However, the finding is also not biologically plausible as one would expect ease of access to healthcare services to improve health outcomes. The discrepancy could be because “distance from the facility” in the current study was measured through self-report with no objective validation of the participants’ reports. This may have introduced information bias and some responses may have been influenced by social desirability bias. On the hand, the finding may reflect under-utilization of healthcare services and poor health seeking behaviors in this population. Elderly programs may consider community and home-based care approaches and qualitative studies may also help expound on this behavior.

In this study we found that people who had a higher DDS (≥ 60) were less likely to be malnourished. The findings are similar to those from Ethiopia[18]. Eating a balanced diet is recommended to prove nourishment[25] and so it is not uncommon that people who eat healthy stay healthy even the older adults[26].

The study findings are not to be considered without any reservations. Although the study extensively explored the dietary habits and frequency of food in-take, we did not study meal timing which is key in proper nutrition[27]. We recommend further studies to consider the timing aspect and how it may influence nutrition in this population. Likewise, a qualitative study to explore other factors like psychosocial, cultural and environmental factors may be considered for further research to further explain malnutrition elderly persons. Needless to mention, this was a cross-sectional study hence we could not establish causal associations. Lastly, our study was limited to the rural setting. Although this may hinder generalization of the study findings to urban settings, in it lies the uniqueness of our study concept as the conflicts in northern Uganda coupled with the limited opportunities in rural areas left rural settings more vulnerable to the aftermaths of the wars[28] compared to the urban areas making them more of interest to study.

Conclusion

Majority of the elderly persons were malnourished. The findings also revealed that elderly persons had a decline in food intake; and age, education, dietary diversity and distance were the factors that influenced nutritional status. The prevalence of malnutrition prompts for a need for nutritional and food relief programs in this population. There’s need for age-appropriate elderly health education programs. Programs should aim at bringing healthcare services nearer to the elderly through community and home-based approaches. Future studies may explore follow-up study designs to assess changes in nutrition and dietary practices over time and qualitative studies to explain the dietary behaviors among the elderly persons.

Abbreviations

BMI – Body Mass Index

DDS – Dietary diversity score

FFQ – Food Frequency Questionnaire.

LC-Local Chairperson

MNA-SF – Mini Nutritional Assessment – Short Form

MUAC – Mid-Upper Arm Circumference

WHO – World Health Organisation

Declarations

Ethical approval

The study was approved by the Clarke International University Research Ethics Committee (CIUREC) (CLARKE-2021-68). Only participants who provided written informed consent and had a witness to attest to the study processes were included in the study.

Consent for publication

All authors reviewed and approved the final draft of the manuscript for publication.

Availability of data and materials

The data and tools used in this study are available upon request from the corresponding author.

Competing interests

All authors declare no conflict of interest.

Funding

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Authors contributions

DO conceived the concept for the study. DO, JN and FA worked on proposal development and study tools. DO coordinated the data collection process. RN conducted the data analysis. DO, JN, JK, RN, FA reviewed the draft manuscript. All authors reviewed and approved the final manuscript.

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