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Prevalence of Under-Nutrition and Food Security among the Elderly in Uasin Gishu County, Kenya

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ABSTRACT: Nutritional status of the elderly is an important determinant of their health and quality of life. Under-nutrition among elderly people is becoming significantly high regardless of the progress on the health care system. The objective of this study was to assess the prevalence of under-nutrition and food security among the elderly aged 60 years and above in Moiben Division in Uasin-Gishu. A cross-sectional survey was done using questionnaire and anthropometric measurements to collect data from 324 elderly persons. The study estimated the prevalence of undernutrition to be 41 percent. The study also showed a strong association between food security and nutrition status of elderly people at 95% level of significance. In conclusion, the optimal nutrition among the elderly has implications for improving their health status and general well-being, as well as for reducing the burden on limited health care resources. The study recommended the establishment of a nutrition awareness campaign in Moiben division.

Key Words: Food Security, Prevalence, Nutrition

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I. INTRODUCTION

Globally, the number of persons aged 60 years and above is growing rapidly. It has risen from 962 million in 2017 and is projected to double to 2.1 billion in 2050 and to triple to 3.1 billion by 2100 (World Population Prospects, 2017). According to the National Population and Housing Census Report (2010), the population of persons aged 60 years and above in Kenya was about 1.5 million, representing 4 percent of the total population. Majority of these elderly persons reside in communal areas where they struggle to meet their basic needs and according to (Elia, & Straton, 2010), 51% of the chronically ill are the elderly people above the age of 60 because of unaffordable medical bills that are coupled with physical, functional and cognitive impairment that make them vulnerable to food insecurity.

The elderly are widely acknowledged to be a group which is nutritionally vulnerable due to age-related biological factors that increase the risk of nutritional deficiencies (Quandt *et al.,* 2001; Virtuoso *et.al.* 2012). WHO (2008a) stated that due to rising cases of Acquired Immune Deficiency Syndrome (AIDS), there has been a rise in the number of orphans who are left in the care of the elderly. FAO (2008) indicated that approximately 5 million elderly persons in Africa were undernourished hence incapable of meeting their dietary needs. Moreover, children orphaned due to HIV AIDS and left under the care of the elderly do not receive the best of care due to ill health of their caregivers (Nyambedha et al., WHO, 2008).

According to Visvanathan and Chapman (2009), the elderly experience early satiety, loss of appetite, physiological changes, physical immobility and swallowing problems. Consequently, the elderly become vulnerable to malnutrition. Concerns have been raised by FAO, (2010) that elderly may bear a disproportionate share of the burden of food insecurity and hunger because of poverty and economic stress due to lack of income and assets as well as the competing demands for money such as health care, transportation, and housing costs.

For over a decade, the food security situation in Kenya has been precarious with major impacts on the population access to food and water in the overall levels of health and nutrition particularly among the most vulnerable groups (KFSSG, 2012). Despite government efforts to revitalize agriculture through reduced prices of inputs and improving the prices of food commodities, Uasin-Gishu County in which Moiben Division is situated, still experiences food scarcity (KFSSG, 2011).

Agriculture is the main source of food and income for the majority of rural small-scale farmers, and those in Uasin-Gishu County are no exception because 80% of the farmers in the County are small-scale owning less than 5 acres of land and depend mainly on agriculture as a source of livelihood (Kimani, 2016). Traditionally maize, wheat, and livestock have been relied upon by the farmers in the county as the main source

of food and income. Unfortunately, reliance on these crops has not been beneficial to the smallholder farmers most of whom are the elderly due to low incomes associated with them and the issue of failure to have enough rains for the successful growth of their crops (Justus, Lilian, and Mary, 2016). The quality and length of life of the elderly are reduced by nutritional deficiencies whose risk factors are age-related. Unless factors that enhance the household's food security are known and ways of promoting them are devised, inadequate access to food and poor intake of nutritious food will continue to compromise the overall health of elderly people in communal areas (WHO, 2008).

In the United States, The Administration of Aging (AOA) reported that one out of four elderly Americans suffers from poor nutrition (AOA, 2015). In Africa the prevalence of under-nutrition in the elderly ranges between 9.8% to 36.1% in men and 13.1 to 27% in women (Charlton &Rose, 2001). The elderly persons are faced with many challenges when it comes to issues of nutrition and food security because most of them enter elderly age after a lifetime of poverty and deprivation, poor access to health care and a diet that is usually inadequate in quantity and quality (Suraiya & Mandar 1999; Charlton & Rose, 2001).

In the wake of the Human immunodeficiency virus infection and acquired immune deficiency syndrome (HIV/AIDS) crisis, African grandparents are taking on more responsibility for their grandchildren's care. In 2005, an estimated 24.5 million Africans were living with HIV and AIDS accounting for approximately 64% of global HIV and AIDS cases (UNAIDS, 2006). The high mortality rates of adults with HIV and AIDS have produced approximately 12 million orphans whose care is largely been left to grandparents and other relatives (UNAIDS, 2006).

The Academic Model Providing Access to Healthcare (AMPATH) program, which is under Moi Teaching and Referral Hospital (MTRH) offers treatment to HIV and AIDS patients via satellite clinical sites in several regions of western Kenya including Moiben division. These satellite sites were opened as a result of poor adherence to medication and return to clinic visits by the patients (Ampath, 2011). Moiben was chosen as a study area owing to the growing numbers of elderly persons, some of whom were HIV positive and others accompanying their HIV orphaned grandchildren to the clinic. In addition, Moiben is located within the breadbasket region of Kenya, has agricultural potential yet it is food insecure (KFSSG, 2012). This is due to numerous challenges such as increased risk to ailments, lack of income to access appropriate health services, long distances to health facilities, inadequate supply of drugs and negative attitude of health workers continues to pose a big challenge in the elderly person's day to day life (Julie, et al., 2009). Poor nutritional status and food insecurity among the elderly increase the risk of morbidity and mortality because, their vulnerability exposes them to increased susceptibility to infections that may delay recovery and prolong hospitalization thus decreasing their quality of life (Ahmed & Haboubi, 2010). This study, therefore, assessed the prevalence of undernutrition and food security among the elderly in Moiben Division Uasin-Gishu County.

II. METHODOLOGY

Study Design

A cross-sectional descriptive survey was adopted in this study. This enabled sampling of study subjects from the population of interest that were measured at a single point in time (Cohen, et al., 2000). The design was applied in this study since the intention of the researcher was to examine and report on the nutrition and food security status of the elderly in Moiben at a given point in time and report the situation as it is. No intervention such as food supplements or health care were offered to respondents.

Study Area

The area of study was Moiben Division of Eldoret East Sub County in Uasin-Gishu County. Although Moiben is classified among the high agricultural potential areas in Kenya, it is faced with challenges such as seasonal food scarcity that hinder sustenance of household food security (KFSSG, 2011). The main economic activities in the division include both large and small scale maize, wheat, passion fruit, and dairy farming. The Kalenjin tribe especially Keiyo's are the most dominant in the region.

Target Population

The target population consisted of elderly persons above 60 years living in Moiben. This age limit was based on WHO standards (WHO, 2011).

Sample Size

This sample size of the study was derived using the Fisher's formula

$$n = \frac{Z^2_{(1-\alpha/2)} \cdot \mathrm{p}(1-\mathrm{p})}{d^2}$$

$$\mathrm{n} = \frac{1.96^2 \times 0.11 \times 0.89}{0.035^2}$$

n= 295

The sample size was then increased by 10% to account for non-response. Thus, the final sample size:

n = 295 x 1.1

= 324 elderly people

Sampling Procedure

A multi-stage proportional-to-size cluster sampling involving four stages was followed The first stage involved randomly selecting three out of ten locations within Moiben division using the lottery method. This was done by selecting the locations involved through writing yes or no on pieces of paper, folded and put in a bowl. The pieces of paper were then thoroughly mixed and a representative from each location picked a folded piece of paper. Those respondents who picked yes participated in the study. The three selected locations comprised of the Meibeki, Karuna, and Koitoror. In the second stage, elderly people aged 60 years and above were clustered into three locations namely Meibeki, Karuna and Koitoror. In the third stage, the number of respondents was obtained by determining the proportion of the total number of elderly people in each location against the computed sample size of 324 elderly people. In the fourth stage, elderly people were picked systematically at an interval of the fourth household per location. One elderly person was interviewed per selected household, usually the husband as head of the household in African context but in circumstances where he was absent or unable then the wife was interviewed.

Data Collection

Data was collected using interviewer-administered questionnaires. This technique was chosen since it helped interviewers to clearly explain to respondents all the variables required for the study, assist respondents who do not know how to read and write to fill research questionnaires, enabled researcher to obtain first-hand information and also to motivate them to participate in the data collection exercise. Questionnaire for this study was divided into three main sections namely household demographic characteristics, anthropometric measurements, morbidity, and food security assessment.

Food Security Measurement

The Household Food Insecurity Access Scale (HFIAS) was used to collect food security information. Coates et al., (2007) maintain that HFIAS is useful in assessing whether households have experienced problems with accessing food during the last 30 days. The instrument consisted of nine occurrence questions and nine frequency questions; the questions on HFIAS inquired the changes households made in their diet or food consumption patterns as a result of limited resources to acquire food. The respondent was first asked if a given condition was experienced (yes or no) and if it was then, with what frequency (rarely, sometimes or often). The resultant response was transformed into either a continuous or a categorical indicator. For the continuous indicator, calculations for each of the nine questions were scored between 0-3, with 3 being considered the highest frequency of occurrence (often). The score of each was then added together. The total HFIAS ranged from 0-27 indicating the degree of insecure access. As a categorical variable, households were categorized as mildly food secure moderate food insecure or severe food insecure. The three categories created were then matched with the results of the continuous indicator (after scoring each of the nine questions) as follows; 0 to 2 indicated less food secure, 3 to 10 indicated moderately food insecure and 11 to 27 were categorized as severely food insecure. This tool was used to measure the level of food insecurity during the past 30 days as self-reported by the household and results in a continuous measure (0-27 with higher numbers meaning greater food insecurity) (Figure 3.1) or categorical designations (food secure, moderate food insecure and severe food insecure).

Body Mass Index (BMI)

After taking the height Body Mass Index (BMI) was calculated. BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in meters (kg/m2).

Data Analysis

Data from the field was checked, cleaned and coded using suitable computer software (SPSS version 23). The processed data was analyzed by the use of both descriptive and inferential statistical techniques. Frequencies and percentages were computed to describe the key socio-demographic characteristics of the study sample. The descriptive statistics were used to estimate the prevalence of under-nutrition and food insecurity. Chi-square test was used to test the relationship between food security and nutrition status as well as the association between food security and socio-economic factors.

III. FINDINGS AND DISCUSSIONS

Demographic Characteristics of Respondents

Table 1: Demographic Characteristics of Respondents

Characteristics	Locations			
	Total N=324	Karuna N=97	Koitor N=82	Meibek N=145
Gender				
Male	142 (43.82)	39 (40.21)	35 (42.68)	67 (46.21)
Female	182 (56.17)	58 (59.79)	47 (57.31)	78 (53.79)
Civil Status				
Married	211 (65.12)	63 (64.95)	47 (57.32)	101 (69.66)
Divorced	11 (3.40)	3 (3.09)	5 (6.10)	4 (2.76)
Single	19 (5.9)	12 (12.37)	3 (3.7)	4 (2.76)
Widow	83 (25.62)	19 (19.59)	27 (32.93)	36 (24.83)
Education				
Primary	142 (43.83)	44 (45.36)	42 (51.22)	56 (38.62)
Secondary	19 (5.86)	6 (6.19)	5 (7.32)	7 (4.83)
Tertiary	7 (2.16)	0 (0)	0 (0)	7 (4.83)
None	156 (48.15)	47 (48.45)	32 (39.02)	75 (51.72)
Religion				
Muslim	1 (0.31)	0 (0)	1 (1.22)	0 (0)
Christian	323 (99.69)	97 (100)	81 (98.78)	145 (100)
Age				
60-69	164 (50.62)	47 (48.45)	47 (57.32)	70 (48.28)
70-79	112 (34.57)	31 (31.96)	26 (31.71)	53 (36.55)
Over 80 years	48 (14.81)	19 (19.59)	9 (10.22)	22 (15.17)
House hold size				
Mean(std)	5 (2.5)	5 (2.7)	5 (1.8)	6 (2.6)

(Source: Survey data, 2017)

The demographics of the respondents was sought to give an insight into the respondent's characteristics which include age, gender, marital status, education and religion (table 4.1). More than half 182(56.17 %) of the respondents were females and 211(65.12 %) of respondents indicated that they were married while a very small proportion 11(3.4%) were either divorced or separated, (25.6%) were widows/widowers. Half of the respondents were between the ages of 60 and 69 years old on average across all the locations while just about 14.81% were above the age of 80 years. Majority of the respondents 156(48.15%) had no formal education while only 26(8.02%) had attained at least secondary education. Education across the different locations followed a similar trend with Meibeki having the highest number of respondents (51.72%) without any formal education. This can be attributed to poverty and perception of respondents towards formal education. Households had on average 5 occupants per household with a standard deviation of ±2.5. In general, more than 99% of the respondents were Christians with Karuna and Meibeki having no Muslims at all.

Nutrition Status of the Respondents

Table 2: Nutrition Status of the Respondents

Characteristics	Nutritional Status		
	Underweight (17-18.4 kg/m^2)	Normal (18.5-24.9 kg/m^2)	Overweight (25-29.9 kg/m_2)
	N=135	N=166	N=23
Location			
Karuna	34 (35.42)	52 (54.17)	7 (10.42)
Koitor	27 (33.33)	43 (53.09)	11 (13.58)
Meibeki	45 (30.34)	91 (62.76)	6 (6.90)

(Source: Survey data, 2017)

The nutrition status was as follows; 166 (51%) were normal weight while 135 (42%) were underweight and 23 (7%) were overweight. The prevalence of malnutrition was, therefore, 42% in Moiben division which represented all respondents who were underweight. The finding was in line with the study by (Brown, 2006 and Brown et al, 2014) who found 24% and 28% malnutrition prevalence among the elderly people.

Association between variables

Table 3: Association between nutrition status and food security

Food security status	**Nutrition status**				Total	Chi-square
	Under Weight (<18.5)	Normal Weight (18.5-24.99)	Over Weight (25-29.99)	Obese (>30)		Sig.
Less food insecure (0-2)	0	4	13	2	19	
Moderate food insecure (3-10)	1	100	5	0	106	0.000
Severe food insecure (11-27)	143	62	3	0	199	
Total	135	166	21	2	324	

*χ^2=291.731[a], DF=6

The study results showed strong statistical evidence of an association between food security and nutrition status among the elder people (chi-square =291.731a, DF=6, p-value=0.000). The result further indicated that among the respondents who were less food insecure; none was underweight, 4 normal weights, 13 overweight and only 2 were obese. The study also revealed that among the respondents who were moderate food insecure; 1 was underweight, 100 normal weights, 5 overweight and none were obese. The study results further showed that among the respondents who were severe food insecure; 134 were underweight, 62 were normal weight, 3 were overweight and none was obese. The findings implication was due to the fact that most of the elderly people in Moiben had a low intake of calories, appetite and were also vulnerable to disease which resulted in underweight among the elderly people. Some of the respondents, therefore, resolved to sell stored food in order to get medication resulting in a negative impact on food security.

A similar result was obtained by Asif, (2014) where they found out that food insecurity is a strong predictor of health problems such as heart disease, cancer, stroke, pulmonary disease or diabetes (p. 6–7). Also, a study by Christensen, et al., (2009) indicated increase prevalence of chronic disease, including heart disease, diabetes, arthritis, hypertension, as well as increased incidences of all cancers that make the elderly become more vulnerable especially in the developing countries.

According to the study by Ngatia et al., (2012), there was a high prevalence of severe food insecurity and underweight among the elderly people in the city of Nairobi. Additionally, a study by RTI International, (2014) identified poor nutrition as a source of chronic illness which can contribute to emotional distress, particularly depression. A recent study by Rashmi et al., (2015) also found out the same result of the high prevalence of malnutrition among the elderly people in their study on assessment of the nutritional status among the elderly people.

IV. CONCLUSIONS

In conclusion, there is a relationship between food security and the nutrition status of the elderly according to (Alley et al., 2009); unmet needs for material resources like adequate food and the proper nutritional makeup of those foods are strong and detrimental forces in shaping the health of the elderly persons. This is particularly true for minority populations especially the elderly living in the third world countries who unequally experience a lack of basic needs compared to whites. In general, optimal nutrition among the elderly has implications for improving their health status and general well-being, as well as for reducing the burden on limited health care resources. The challenge is to identify and tackle the basic and underlying causes of food insecurity and poor nutritional status of the elderly in Moiben, Uasin-Gishu County.

Based on the result of this study, the following recommendations listed might help in planning strategies for improving nutritional status and food security for the elderly. There is a need to have more nutrition awareness campaigns in Moiben division. A study conducted by Banrtry et al., (2011) indicated the importance of nutrition education programmes for the elderly. The importance of dietary diversity in the diet to alleviate nutritional problems and related diseases should be included. Moreover, nutrition awareness is essential to inform the elderly people to modify their food procurement, preparation and meal patterns to address the prevalence of various micronutrient deficiencies. However, a sustainable nutrition programme would benefit this community by helping them to make informed nutritious food choices, and, therefore improve their dietary patterns, food habits, food preparation, and meal planning skills within a limited household.

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