

ANTHROPOMETRIC STATUS AND NUTRITIONAL RISKS OF OLDER ADULTS IN UMUAHIA METROPOLIS, ABIA STATE NIGERIA

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ABSTRACT

Background: A thorough nutritional assessment is necessary for successful diagnosis and development of appropriate/comprehensive treatment plans for malnutrition among older adults.

Objective: This study assessed the anthropometric status and nutritional risks of older persons in Umuahia Metropolis, Abia state.

Methods: The study was descriptive cross-sectional in design. A two-stage sampling technique was used to select 305 respondents. A structured questionnaire was used to elicit information on the relevant characteristics. Mini Nutritional Assessment (MNA) form and Malnutrition Universal Screening Tool (MUST) were used to categorize the respondents' nutritional risk. Anthropometric values were compared with their standard recommendations. Descriptive statistics were computed for the categorical and continuous variables using SPSS version 25

Results: The study findings revealed that a good number (44.3%) of the older persons in the study area were between 60-64 years, had family size of 4-6 members and earned income between ₦30,000 -50,000 (50.8%) and above ₦50,000 (45.9%). Majority of the respondents were normal or at low risk of nutrition using MNA (89.2%) and MUST (93.4%) classification. Similarly, most of the older adults had normal body mass index (74.4%), mid upper arm circumference (88.9%), waist hip ratio (65.2%) and calf circumference (85.6%) status.

Conclusion: This study revealed that the respondents had normal/safe nutritional and health status using the various anthropometry and malnutrition assessment scales. Therefore, efforts to maintain healthy nutritional status and improve the socio-economic profile of older adults should be encouraged.

Keywords: *Older adults, anthropometry, nutritional risk, Umuahia Nigeria*

INTRODUCTION

Worldwide, the elderly population is increasing, and with it, the prevalence of malnutrition (1).

The global number of older persons is projected to rise from an estimated 524 million in 2010 to nearly 1.5 billion in 2050, with most of this increase in developing countries (1). Despite the significant medical advances, under-nutrition remains a significant and highly prevalent public health problem amongst older adults. This is a result of a gradual decline in general body function, decreased mobility and increasing level of dependency for livelihood associated with aging.

Estimates of the prevalence vary, as detection methods in older adults are not standardized. However, the prevalence of malnutrition is undeniably high: the overall prevalence is 22.6% (2). Nearly 40% of hospitalized older persons and 50% of those in rehabilitation facilities are malnourished, and 86% are either malnourished or at risk of malnutrition (2). Up to 67% of older persons in nursing homes are malnourished or at risk of malnutrition while 38% of the older persons living in the community were at risk of malnutrition 38% (2).

Malnutrition may delay recovery and prolong hospitalization, leading to increased susceptibility to infection, impede individual's dependence and quality of life, and even increases the risk of death in many patients (3). Malnutrition poses a huge economic cost to society. The malnourished older persons are more likely to require health and social services, have more hospitalizations, and cause a burden on caregivers (4). Several studies (5-12) have reported the nutritional status of older adults in Nigeria using various reference standards, there is limited evidence on the nutrition risk level of older adults in South East Nigeria (9-12). Therefore, this study is designed to assess the anthropometric status and nutritional risk among older adults (≥ 60 years) in Umuahia Metropolis.

METHODS

Study design

A cross sectional study design was employed in this study

Study Area

Umuahia is located along the rail road that lies between Port Harcourt to its South and Enugu city to its North. Umuahia has a population of 359,230

according to the 2006 Nigerian census (13). Umuahia Metropolis is made up of Umuahia North and Umuahia South Local Government Areas. The agro-ecological climatic condition of the study area is typical of the tropics. Farming, trading and civil/public service jobs are the predominant occupations of the people of Umuahia.

Sampling/sampling techniques

The sample size was selected using a multi-stage sampling procedure. The five major clans in Umuahia metropolis were purposively selected. Simple random sampling procedure (balloting without replacement) was used to select five urban communities from each of the selected clans. Furthermore, the respondents were randomly selected. The five major clans and the selected communities in Umuahia metropolis include; Ahiaukwu Umuagwa community in Olokoro, Eziamia Ussa in Umuokpara, Obuohia community in Ibeku, Apumeri in Ubakala and Isinkwo Amato community Ohuhu.

A sample size of 61 respondents was estimated using the statistical formula for calculating sample size of infinite population (6), $n = \frac{z^2 pq}{d^2}$

where n = sample size

z = Confidence interval of 1.96 or approximately 2 (constant)

d = tolerance/error

p = prevalence of older adults in Nigeria - 4% (4,5)

p = 1-p

$n = \frac{1.96^2(0.04)(0.96)}{0.05^2} \cong 61$ respondents

Therefore, sample size was multiplied by the selected five (5) clans; $61 \times 5 = 305$ respondents

Informed consent

No adverse reactions were expected as the participants were interviewed and measured and no invasive procedures were carried out. Written consent was obtained from the respondents and only those who gave their informed consent were used for the study.

Data collection

Five (5) research assistants were selected and trained on the use of survey instruments.

Data was collected with an interviewer administered structured questionnaire. This was used to elicit information on the respondents' socio-economic characteristics, dietary habits and nutritional risks.

Anthropometric Measurements

Weight and height were assessed using standard procedures. The weight was measured using a

bathroom scale, to the nearest 0.1kg with the respondent barefooted and with minimum cloth on.

The heights of the respondents were measured using a stadiometer with the respondents standing erect on a flat platform with shoes removed looking straight ahead and hands in both sides. The movable head plate was then lowered into the crown of the head and read off to the nearest 0.1cm.

Body mass index (BMI) was calculated using weight in kilogram divided by the square of the height in metre. The BMI was classified using the WHO classification of BMI (14).

The respondents' waist and hip circumferences were measured using a non-stretchable tape. They were made to stand comfortably with their weight evenly distributed on both feet and the feet about 25 to 30 cm apart. The waist measurement was taken midway between the upper hip bone and the uppermost border of the right iliac crest. The tape was placed around the abdomen at the level of the midway point. Hip circumference on the other hand was measured with the respondents standing erect with arms at the sides and feet together. The researcher sat at side of the respondent so that the level of maximum extension of the buttocks was seen. The tape was placed around the buttocks in a horizontal plane. Readings were taken when the tape is snug but does not compress the skin and underlying soft tissues. The circumference was measured to the nearest 0.1cm at the end of normal expiration (15).

The calf measurement was measured using a measuring tape. The measurement was on the right side of the leg. The respondents stood erect with their weight evenly distributed on both feet and legs slightly apart. The measuring tape was positioned horizontally around the largest circumference of the calf and measurement was taken to the nearest 0.1cm (15).

MUAC circumference was measured using a measuring tape. The subject left hand was bent to the elbow at a 90-degree angle, with the upper arm held parallel to the side of the body. The tape were placed at the midpoint between the top of the shoulder and the tip of the elbow (olecranon process and the acromium) and measurement was taken to the nearest 0.1cm.

The values obtained from these circumference measures were computed and compared with standard categories (16,17).

Nutrition risk screening/assessment tools

The Malnutrition Universal Screening Tool (MUST), for the ambulatory setting and the Mini Nutritional

Assessment (MNA), for institutionalized generic patients (18, 19), were issued to the respondents and properly monitored to ensure it was properly filled and those who could not write well, were assisted by the researcher and the researcher assistant.

Scores were assigned to respondents' response to MNA questions on chewing/swallowing difficulties, mobility, weight loss, neuropsychological problems, Body Mass Index etc. and overall nutritional risk computed using the following categorization - 12-14 points: normal nutritional status; 8-11 points: at risk of malnutrition; 0-7 points: malnourished (18).

MUST examined three independent criteria; weight, unintentional weight loss and presence of acute disease. Each parameter was scored as 0, 1 and 2. Patients are classified as low-risk (0), medium-risk (1) and high risk (>2) (19).

Statistical analysis

Data collected were entered into the computer and analyzed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were computed for the continuous and categorical variables.

RESULTS

Table 1 presents the result of the respondents' socio-economic characteristics. A good number of the respondents were aged 60-64 (44.3%) and 65-69 (36.1%) years. More than half of them were females (59.0%) while 41.0% were males. There were more married (62.3%) than widowed (30.8%) and divorced (4.9%) persons. Christianity (93.4%) and Igbo tribe (91.5%) dominated the religious and ethnic groups respectively. The respondents reported having 1-3 (22.6%) and 4-6 (59.0%) household members. More than a quarter (29.2%) and close to half (45.9%) of the respondents had primary and secondary education,

respectively. Less than half (44.3%) and a quarter (22.9%) of them were pensioners and farmers. Half (50.8%) of the elderly received/earned income or allowance of ₦30,000 –50, 000

Results from Table 2 revealed the anthropometric status of older adults. Results revealed that majority (74.4%, 88.9%; 85.6%) of them had normal body mass index, mid upper arm and calf circumference status, respectively. Results on waist circumference revealed that increased risk of metabolic diseases was observed in 59.0% of the respondents; also, waist hip ratio reports revealed that a good number (34.8%) of the older adults were at risk of metabolic disease.

Information on the nutritional risk assessment of the respondents using MNA screening tool is summarized in Table 3. Results revealed that majority (72.1%) of them had no food intake decline, weight loss (>1 kg) over the last 3 months was observed in 16.4% of the respondents. Majority (91.8%) of them were mobile, had not experienced psychological stress/acute disease nor neuropsychological problems. Body Mass Index of 21-23 kg/m² (49.2%) and above (49.2%) were observed in about half of the respective respondents. Results on the overall nutrition risk of older adults revealed that majority (89.2%) of them had normal MNA status, 8.2% were at risk of malnutrition and 2.6% were classified malnourished.

Results from malnutrition universal screening tool (MUST) is summarized in Table 4. Results revealed that most (68.2%) of them had a BMI value of 18.5-20-24.9 kg/m². More than half (52.5%) of them were classified as low risk owing to their less than 5% weight loss in 3-6 months. Majority (75.4%) of the respondents were at medium risk of acute disease. Low risk of malnutrition was observed in majority (93.4%) of the respondents.

Table 1: Socio-economic characteristics of the older persons

Variables	Frequency (N= 305)	Percentage (%)
Age (years)		
60-64	135	44.3
65-69	110	36.1
70-74	30	9.8
75-79	20	6.5
80 and above	10	3.3
Sex		
Male	125	41.0
Female	180	59.0
Marital status		
Married	190	62.3
Widowed	94	30.8
Divorced	15	4.9
Single	6	2.0
Religion		
Christianity	285	93.5
Islamic	5	1.6
Traditional	15	4.9
Ethnic group		
Igbo	279	91.5
Hausa	6	2.0
Yoruba	8	2.6
Others	12	3.9
Family size		
1-3	69	22.6
4-6	180	59.0
7-9	45	14.8
Above 9	11	3.6
Highest Educational Qualification		
No formal education	10	3.3
Primary education	89	29.2
Secondary education	140	45.9
Tertiary education	66	21.6
Occupation		
Farming	70	22.9
Trading	30	9.8
Pensioner	135	44.3
Artisan	45	14.8
Others	25	8.2
Monthly income/ allowance		
₦18,000 – 30, 000	10	3.3
₦30,000 –50, 000	155	50.8
Above ₦50,000	140	45.9

Table 2: Anthropometric status of the Older Persons

Variables	Frequency (N=305)	Percentage
Body Mass Index		
Underweight (<18.5kg/m ²)	11	3.6
Normal (18.5-24.9 kg/m ²)	227	74.4
Overweight (25.0-29.9 kg/m ²)	48	15.8
Obese (≥30.0kg/m ²)	19	6.2
Waist circumference		
At risk (male 90-101cm; female:81-87cm)	125	41.0
Increased in risk (male102cm; female:88cm)	180	59.0
Waist hip ratio		
Low risk/safe (male:≤0.09cm, female: ≤0.07)	199	65.2
At-risk (male:>1.0, female:>0.80)	106	34.8
Mid Upper Arm Circumference (MUAC)		
Malnourished (male:<23cm, female:<22cm)	34	11.1
Normal (male: 24-30cm, female:23-30cm)	271	88.9
Calf circumference		
Normal (≥31cm)	261	85.6
At risk (<31cm)	44	14.4

Table 3: Nutritional risk of older adults using MNA

Variables	Frequency (N=305)	Percentage
Decline of food intake over the past 3 months		
0 = severe decrease in food intake	23	7.6
1 = moderate decrease in food intake	62	20.3
2 = no decrease in food intake	220	72.1
Weight loss during the last 3 months		
0 = weight loss greater than 3 kg (6.6 lbs)	25	8.2
1 = does not know	163	53.4
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)	25	8.2
3 = no weight loss	92	30.2
Mobility		
0 = bed or chair bound	0	0.0
1 = able to get out of bed / chair but does not go out	25	8.2
2 = goes out	280	91.8
Suffered psychological stress or acute disease in the past 3 months		
1 = yes	25	8.2
2 = no	280	91.8
Neuropsychological problems		
0 = severe dementia or depression	5	1.6
1 = mild dementia	20	6.6
2 = no psychological problems	280	91.8
Body Mass Index (BMI) (kg/m²)		
0 = BMI less than 19 kg/m ²	9	3.0
1 = BMI 19 to less than 21 kg/m ²	35	11.5
2 = BMI 21 to less than 23 kg/m ²	150	49.2
3 = BMI 23 or greater kg/m ²	111	36.4
Categorized Nutritional Risk		
Normal (12-14)	272	89.2
At risk (8-11)	25	8.2
Malnourished (0-7)	8	2.6

Table 4: Nutritional risk factors of older adults using MUST

Variables	Frequency (N =305)	Percentage (%)
BMI Score		
BMI (< 18.5kg/m ²)	11	3.6
BMI (18.5-20-24.9 kg/m ²)	227	74.4
BMI (>25.0 kg/m ²)	67	22.0
Weight loss in 3-6 months		
Low-risk (< 5%)	160	52.5
Medium-risk (5-10%)	44	14.4
High risk (>10%)	25	8.2
Do not know	76	24.9
Acute disease effect		
Low-risk	45	14.8
Medium-risk	230	75.4
High risk	30	9.8
Categorized Nutritional Risk		
Low malnutrition risk (0)	285	93.4
Medium malnutrition risk (1)	15	5.0
High malnutrition risk (>2)	5	1.6

DISCUSSION

In the present study, the anthropometric status and nutritional risk of older persons in Umuahia metropolis in Abia State, Nigeria was assessed. For the age of the older persons, 44.3% were between the ranged of 60 to 64 years, followed by 65-69 years with 36.1%. This agrees with reports from Afolabi et al. (6) who reported that more than half of the elderly in their study were 58-68 years. The preponderance of under-70 older adults may be partly due to poor survival capacities among the elderly population entrenched in the extent of poverty in the country (20).

Similarly, the preponderance of female (59.0%) respondents observed in this study have been reported elsewhere (21). Christianity was the predominant religion in the area, this may be attributed to the location of the study.

The level of secondary education reported in this study compares closely with the findings of another study (6) which revealed reported that 48% respondents had attained secondary education. Several studies (22-24) affirmed that the educational level of the elderly significantly affect their health and nutritional status. The highest range of monthly income or allowance of the older persons fell between #30,000 – #50, 000 (50.8%) while a good number of older persons earned below #30000. This is not surprising because in Africa, particularly Nigeria, many older people retire at age 60 years and are left with insufficient personal savings, decreased earning capacity and increased reliance on pension and children/relatives' allowance to cater for their livelihoods (25).

The prevalence of overweight and obesity (21.9%) reported in this study compares with findings from other studies (26, 27), where 23.9-30.0% of them reportedly had high body mass index ($\geq 25\text{kg/m}^2$).

The high-risk level of a good number of the respondents in this study corroborates with findings of studies conducted in Abia State Nigeria (27) where high fat distribution was observed. Waist circumference and waist hip ratio are better predictors of abdominal fat or adiposity than other measures (28). Using the MNA tool, a high prevalence of normal nutrition among the sampled elderly population in Umuahia was found. It was observed that 2.6% of the participants were malnourished and 8.2% at risk of malnutrition. A technical brief published in 2012 reported similar findings among the elderly in the Pharping district of Nepal: 10% of the elderly were malnourished and 1% were at risk of malnutrition (29). However, other studies conducted in the South East (21) and South Western (30) Nigeria region reported that more than half and quarter of their subjects were at risk of malnutrition and malnourished, respectively. This indicates a low burden of malnutrition among the older persons in Umuahia Metropolis. Adequate nutrition promotes good nutritional status and thus satisfies the requirement for good physical health hence the risk of malnutrition is increased with unhealthy dietary habits and practices (31, 32).

Using the MUST tool, it was recorded that majority (93.4%) of older persons had low nutritional risk. This agrees with other studies (33, 34) which reported a low MUST score ($k = 0.16-0.27$) which indicates low nutritional risk.

CONCLUSION

The study revealed that most of the respondents were considered to have normal/safe nutritional and health status using the various anthropometric and malnutrition assessment scales. Therefore, efforts to maintain healthy nutritional status and improve the living conditions of older adults should be encouraged.

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Ethics of human subject participation: This study was conducted according to the guidelines laid down in the Declaration of Helsinki. Written consent was obtained from the respondents after the study scope and objectives were communicated to them.

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Data and material availability: Data and materials used for this research are available from the author, upon reasonable request.

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