

Nutritional Status and Functional Capacity of Elderly in Selected Communities in Ekiti State, Nigeria

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Abstract

The study examined the nutritional status and functional capacity of elderly in selected communities in Ekiti State. The study employed a cross-sectional descriptive survey research design involving 320 elderly who were selected for the study using multistage sampling techniques from four local government areas in Ekiti State. Information on dietary intake was gotten utilizing 24 hours' dietary intake. Weight (kg) and height (m) measurements were done to determine their Body Mass Index. Utilitarian capacity was evaluated utilizing Bristol activity of everyday living and Lawton and Brody instrumental activity of day to day living scale. Data collected was analyzed utilizing SPSS version 23.0. The result revealed that at critical level ($p < 0.05$) affiliation was seen between the degree of useful impairment and BMI of the respondents. The result further revealed that functional capacity is an element that is independently connected with nourishing status of the elderly. Additionally, the aged are defenseless against malnutrition because of some age related factors. Ceaseless assessment of these elements will help in decreasing this threat. It was recommended that provision of educational opportunities for the elderly should be prioritized. This could help to improve their cognitive function and ability to perform IADLs. Educational programs could be offered in a variety of settings such as community centers, libraries, and senior centers.

Key Words: Functional capacity, Nutritional Status, BADL, IADL

Introduction

Nutritional status affects, and it is affected by many diseases especially in older people (Kagansky et al., 2005). The nutritional diagnostic and the identification of the factors that contributed for such diagnostic are essentials but are complex processes. This complexity is due to the occurrence of many physiological as well as pathological modifications which can be inherent to age process or disease. However, economic factor, social factor, lifestyle and aspects of life quality that provide an adequate and healthy feed can represent important tools to evaluate nutritional risk (Gariballa and Forster, 2007). Nevertheless, World Health Organization (WHO, 2019) defined elderly as persons above 60 years of age. In Nigeria, chronological age of 60 years and above is used in classifying older adults and it is considered as retirement age. Ageing is characterized by unique conditions which result from physiological and psychosocial changes; occurrence of some diseases, as well as changes in dietary intake which influence the elderly nutritional status (Silveira et al., 2007). Old age is also associated with occurrence of some chronic diseases, cognitive impairment and changes in some personal factors, such as functional capacity which are imperative to maintain good health status of the elderly (Raji et al., 2005).

Functional ability is vital in ensuring holistic care for the elderly. This ability is one of the better indicators of health among this group of people (Ajayi et al., 2015). Functional capacity can be explained as the capability of performing usual daily activities essential to meet basic requirements, achieve habitual responsibility and maintain health and well-

being (Bassem, 2011). These activities are classified into Basic Activities on Daily Living (BADL) and Instrumental Activities of Daily Living (IADLs) (Tracey, 2008). Basic activities of daily living (BADL) involve the activities that are performed daily, routinely such as dressing, washing, and eating. Instrumental activities of daily living (IADL) are the activities that require association and arranging. This movement incorporates assignments like shopping, utilizing transportation, dinner's arrangement, taking care of funds, housekeeping, and phone use. Among elderly, increase in age and its associated health challenges affect their functional capacity, making them more dependent in performing BADL and IADL, less they become safe and have adverse effect on their nutritional status.

Elderly are vulnerable to malnutrition due to some age related factors. Continuous evaluation of these factors will help in reducing this risk. Nutritional need throughout life is not static, this changes with every stage of life; infancy, school age, adolescent, adulthood and the elderly are all affected in their nutritional needs. For the elderly, changes associated with nutritional requirement may be related to many factors like; normal aging processes, medical conditions, psychological and physical factors, or lifestyles and functional incapability (Oliveira et al., 2009). Among the elderly, various personal and environmental factors can affect their nutritional status. Also multifaceted interaction of personal and environmental factors of this group of people has been found to have significant effect on their nutritional status and overall well-being (Oliveira et al., 2009). In old age, adequate nutrient intake is very essential for achieving and maintaining good and adequate health status, recovering from diseases and infections. Healthy living cannot be achieved among elderly who enjoy little or no care. Similarly, poor health status in the elderly may also make it difficult for them to perform various BADL and IADL activities which will invariably affect the health and quality of life of the elderly.

The nutritional status and functional capacity of the elderly had been measured in large populations using several methodologies in many parts of the world. There seems to be paucity of information on the nutritional status and functional capacity of the elderly in Ekiti State. Hence, this study sought to evaluate the nutritional status and functional capacity of elderly in Ekiti State in order to inform interventions that will be based on scientific findings and targeting to improve nutritional programmes among the elderly.

Purpose of the Study

The specific purpose of the study was to investigate the nutritional status and functional capacity of elderly in selected communities in Ekiti State.

Research Questions

The following research questions were raised to guide the study:

1. What is the extent of energy and nutrient intake rate of the elderly in Ekiti State?
2. What is the functional capacity of the elderly using BADL and IADL in Ekiti State?
3. What is the relationship between nutritional status and functional capacity of the elderly in Ekiti State?

Methodology

Research Design

The study adopted the descriptive survey research design

Area of the Study

The study was carried out in Ekiti State. Ekiti State is one of the southwestern states in Nigeria. It is one of the thirty-six states in the country. The other states in which Ekiti State shares geopolitical zones with include Ondo, Osun, Lagos, Ogun and Oyo states. The capital of Ekiti State is Ado Ekiti. Ekiti, when viewed from the map of Nigeria, is surrounded by a couple of states. The state is at the southwest of Abuja, to its north is Kwara State, and to the east is Kogi State, Ondo state to its south and Osun to its west. The target population for the study was non- institutionalized elderly men and women living in the selected communities of Ekiti State.

Sampling and sampling Technique

A cross-sectional study involving 320 elderly were selected for the study using multistage sampling techniques from four local government areas in Ekiti State which include Ikere, Oye, Efon and Ekiti West LGA. Socio-demographic characteristic of the respondents was obtained using a semi-structured and interviewer administered questionnaire. From each of the selected LGA, two wards were randomly selected given a total of eight (8) wards and four communities were also selected randomly from each ward making thirty-two communities from where the respondents were selected from. In the selected communities, households with at least one elderly male or female (60 + years) living in the community were identified and numbered. The proportionate sampling was used to select ten (10) respondents from each community to make a total of 320 respondents.

Instrumentation

The questionnaire for this study was designed by the researchers and validated by experts in the area. The instrument contained four sections. Section A was on the socio-demographic characteristics of the respondents like; age, sex, ethnic group, religion, family structure, occupation, educational level, and estimated monthly income. Section B was on the nutritional status of the respondents using the anthropometry measurement, body mass index (BMI).

Method of Data Collection

BMI was calculated using the ratio of weight (kg) to height (m²). The weight was measured while standing with only light clothing on and both arms by the side. Prior to the commencement of each measurement, the indicator of the weighing machine was set to zero after which the weight measurement was done and recorded to the nearest kilogram. The weight of the few bedridden elderly was estimated using Onishi *et al* (2012) weight estimation formula:

$$\begin{aligned} \text{Men} &= 0.530 \times \text{waist circumferences (cm)} \\ &+ 0.604 \times \text{calf circumference (cm)} \\ &+ 0.082 \times \text{age} - 19.692 \\ \text{Women} &= 0.401 \times \text{waist circumferences (cm)} \\ &+ 0.528 \times \text{arm circumference (cm)} \\ &+ 0.199 \times \text{height (cm)} - 19.928 \end{aligned}$$

The height of the respondents was measured using a locally made but standardized height

meter. Measurement of arm span was taken for the few elders who are unable to stand erect. The body mass index (BMI) of the respondents was calculated by dividing the weight of the respondents in kilogram by the square of their height measured in meters (m). Values obtained was recorded in kilogram per meter square(kg/m^2) and compared with WHO reference standards (WHO 2019).

Data collection was done with the aid of self- structure questionnaire with the following sections;

- a) Socio-demographic and economic characteristics,
- b) Nutritional Status
- c) Functional capacity

In evaluating the functional ability of the selected elderly, two main types of activities were measured using a standardized functional Assessment scales questionnaire: Basic activities of daily living (BADL) scale and Instrumental activities of daily living scale (IADLs). Basic activity of daily living scale was used to assess the ability of the respondents in performing day-to-day, routine and common activities like; dressing, bathing as well as eating and it was assessed by adapting Bristol Activities of Daily Living Scale. Similarly, instrumental activities of daily living scale (IADLs) was used to evaluate the ability of the respondents in performing more organized and planned activities like shopping, using transportation, meals preparation, handling finances, housekeeping and telephone usage. This was assessed by adapting Lawton and Brody instrumental activities of daily living scale by Lawton (1969).

Method of Data Analysis

The data from the study was subjected to both descriptive and inferential statistics. Descriptive Statistics of percentage, frequency, graph, mean and standard deviation was used. For better interpretation and analysis, scoring of the instrument for assessing functional capacity was done by adapting Johnson *et al.*, (Johnson, 2004) functional impairment formula. The scale (ADL and IADLs) comprises of different sections that addressed different areas of activity and computed using the formula.

$$\text{Functional impairment} = \frac{\text{sum of all rating}}{3 \times \text{total number of rated item}} \times 100$$

The final score represents the level of severity of impairment in BADL and IADL and categorized into; none to mildly impairment (0–33), moderate impairment (34–66%), or severe impairment (>66%) in BADL and IADL. The functional status of respondents was classified into two major categories; functional independent and functional dependent. Respondents with moderate and severe functional impairment was classified as functional dependent while those with no functional impairment (normal) was classified as functional independent.

Results

This section presents the results of the study based on the data collected from the field to provide answers to research questions and hypotheses raised in the study.

Descriptive Analysis

Table 1: Respondents' demographic characteristics.

Demographic Variable	Categories		Frequency	Percentage
Gender	Male		150	46.9
	Female		170	53.1
	Total		320	100.0
Ethnic Group	Yoruba		299	93.4
	Igbo		17	5.3
	Hausa		4	1.3
	Total		320	100.0
Religion	Christianity		163	50.9
	Islam		112	35.0
	Traditional		45	14.1
	Total		320	100.0
Occupation	Civil Servant		87	27.2
	Farming		122	38.1
	Business		92	28.8
	Artisans		19	5.9
	Total		320	100.0
Educational Level	Below	B.Sc.	98	30.6
	Qualification			
	Above	B.Sc.	135	42.2
	qualification			
Estimated Monthly Income	No formal Education		87	27.2
	Total		320	100.0
	Below 50,000		97	30.3
	50,000 – 100,000		62	19.4
	100,000 – 200,000		89	27.8
Estimated Monthly Income	Above 200,000		72	22.5
	Total		320	100.0

Source: *Researcher's field survey (2023)*

Table 1 shows the demographic characteristics of the respondents sampled in this study. It was shown that 150 respondents representing (46.9%) are male while most of the respondents 170 (53.1%) are female. In relation to the ethnic group of the respondents, it was shown that most of the respondents 299 (93.4%) are of Yoruba extraction, 17 (5.3%) of the respondents are of Igbo extraction while the remaining marginal 4 (1.3%) respondents are of Hausa ethnic tribe. In relation to the religion of the respondents, it was shown that most of the respondents 163 (50.9%) were Christians, 112 (35.0%) of the respondents were Muslim faithful while the remaining 45 (14.1%) respondents were self-professed Traditionalists. In relation to the occupation of the respondents, it was shown that 87 (27.2%) of the respondents are civil servants, most of the respondents 122 (38.1%) are farmers, 92 (28.8%) of the respondents are businessmen and businesswomen while the remaining 19 (5.9%) of the respondents are artisans. With respect to the educational level of the respondents, it was shown that 98 (30.6%) of the respondents have qualifications that are below B.Sc. qualification level, most of the respondents 135 (42.2%) have qualifications that are above B.Sc. qualification level while 87

(27.2%) of the respondents do not have any formal education. In relation to the estimated monthly income of the respondents, it was shown that 97 (30.3%) of the respondents earn below 50,000 naira monthly, 62 (19.4%) of the respondents earn between 50,000 and 100,000 naira monthly, 89 (27.8%) of the respondents earn between 100,000 and 200,000 naira monthly, while 72 (22.5%) of the respondents earn above 200,000 naira monthly.

Research Question 1

What is the extent of energy and nutrient intake rate of the elderly in Ekiti State?

Table 2: Mean energy and nutrient intake rate of the elderly in Ekiti State

Male			Nutrient	Female		
Mean $\pm$ SD	^a RDA	%RDA		Mean $\pm$ SD	^a RDA	%RDA
1211.2 $\pm$ 278.1	2054.0	58.96	Energy (Kcal)	1148.3 $\pm$ 412.7	1873.0	61.31
51.6 $\pm$ 8.13	56.0	92.14	Protein (g)	38.0 $\pm$ 17.7	46.0	82.60
247.7 $\pm$ 51.3	130.0	190.5	Carbohydrate (g)	218.3 $\pm$ 3.5	130.0	167.92
13.5 $\pm$ 2.8	30.0	45.00	Fibre (g)	9.2 $\pm$ 3.4	21.0	43.81
1.1 $\pm$ 0.9	1.6	68.75	Polyunsaturated fat (g)	0.7 $\pm$ 0.4	1.1	63.64
1104.6 $\pm$ 143.1	900.0	122.73	Vitamin A-RE	755.6 $\pm$ 162.7	700.0	107.94
47.3 $\pm$ 6.7	90.0	52.56	Vitamin C (mg)	44.0 $\pm$ 13.8	75.0	58.67
1.2 $\pm$ 0.4	2.1	57.14	Vitamin B1 (mg)	0.7 $\pm$ 0.3	1.1	63.64
0.9 $\pm$ 0.1	1.3	69.23	Vitamin B2 (mg)	0.5 $\pm$ 0.2	1.1	45.45
7.6 $\pm$ 1.8	16.0	47.5	Vitamin B3 (mg)	6.2 $\pm$ 2.7	14.0	44.29
0.8 $\pm$ 0.2	1.7	47.06	Vitamin B6 (mg)	0.7 $\pm$ 0.8	1.5	46.67
176.8 $\pm$ 45.1	400.0	44.20	Folic Acid (μ g)	139.0 $\pm$ 56.3	400.0	34.75
1.9 $\pm$ 0.4	2.4	79.17	Vitamin B12 (μ g)	1.1 $\pm$ 0.5	2.4	45.83
277.8 $\pm$ 7.5	1200.0	23.15	Calcium (mg)	116.5 $\pm$ 78.1	1200.0	9.71
299.5 $\pm$ 55.7	700.0	42.79	Phosphorus (mg)	320.1 $\pm$ 124.3	700.0	45.73
822.4 $\pm$ 154.7	1200.0	68.53	Sodium (mg)	708.2 $\pm$ 230.8	1200.0	59.02
729.5 $\pm$ 152.3	4700.0	15.52	Potassium (mg)	630.7 $\pm$ 148.2	1400.0	45.05
11.5 $\pm$ 3.1	11.0	104.55	Zinc (mg)	7.3 $\pm$ 1.6	8.0	91.25
7.85 $\pm$ 0.9	8.0	98.13	Iron (mg)	4.9 $\pm$ 1.7	8.0	61.25
133.8 $\pm$ 44.9	420.0	31.86	Magnesium (mg)	117.2 $\pm$ 31.8	320.0	36.63

a: National Policy and Resource Center on Nutrition and Aging, Florida International University, 2004

Table 2 shows the mean energy and nutrient intake of male and female respondents. The mean energy intake of both male and female respondents (1211.2 $\pm$ 278.1 kcal, 1148.3 $\pm$ 412.7 kcal) was less than RDA by 24.8% and 33.9% respectively. Also, mean protein intake was 92.14% and 82.60% of the RDA among male and female elderly respectively. Carbohydrate intake of both male and female respondents was found to be 190.5% and 167.92% of RDA respectively and the mean vitamin A intake among male (1104.0) and female respondent (755.5) was above the RDA by 22.73% and 7.94% respectively. Intake of water soluble vitamins like; vitamin C and vitamin B complex (B1, B2, B3, B6 and B12), sodium, phosphorus, potassium, magnesium and calcium were below the RDA among both male and female respondents.

Research Question 2: What is the functional capacity of the elderly using BADL and

IADL in Ekiti State?

Table 3: Frequency and percentage distribution of functional capacity of the respondents in basic and instrumental activities of daily living

Functional Activities	Functional Capacity	
	Functional Independent	Functional Dependent
Basic Activities of Daily Living (BADL)		
Eating	287 (89.7)	33 (10.3)
Drinking	280 (87.5)	40 (12.5)
Dressing	275 (85.9)	45 (14.1)
Bathing	260 (81.3)	60 (18.7)
Instrument Activities of Daily Living (IADL)		
Food preparation	167 (52.2)	153 (47.8)
Drink preparation	172 (53.8)	148 (46.2)
House keeping	162 (50.6)	158 (49.4)
Laundry	172 (53.8)	148 (46.2)
Food shopping	179 (55.9)	141 (44.1)
Handling cash	201 (62.8)	119 (37.2)
Mobility around the neighbourhood	200 (62.5)	120 (37.5)
Using Telephone	197 (61.6)	123 (38.4)

Figures in parenthesis denote percentages

From Table 3, the functional ability of the respondents was classified into two major categories: functional independent and functional dependent. Respondents with moderate and severe functional impairment was classified as functional dependent while those with no functional impairment (normal) was classified as functional independent. As presented in table 3 almost all the respondents were functionally independent in BADL like; eating (89.7%), drinking (87.5%), bathing (81.3%) and dressing (85.9%) while others were functionally dependents in eating (10.3%), drinking (12.5%), dressing (14.1%) and functional dependent was most prevalent (18.7%) in the aspect of bathing.

Similarly, more than half of the respondent were functionally independent in performing IADL like; Food preparation (52.2%), drink preparation (53.8%), house-keeping (50.6%), laundry (53.8%), food shopping (55.9%), handling cash (62.8%), mobility around the neighbourhood (62.5%), telephone usage (61.6%). Conversely, less than half of the respondents were functionally dependents in Food preparation (47.8%), drink preparation (46.2%), house-keeping (49.4%), laundry (46.2%), food shopping (44.1%), handling cash (37.2%), mobility around the neighbourhood (37.5%), telephone usage (38.4%). Overall functional dependent was most prevalent in telephone usage (39.3%).

Research Question 3: What is the relationship between nutritional status and functional capacity of the elderly in Ekiti State?

Table 4: Relationship between nutritional status and functional capacity of the

elderly in Ekiti State

Variables	BADL			IADL		
	χ^2	df	p-value	χ^2	df	p-value
Gender	0.14	2	0.85	2.72	2	0.31
Age	75.89	10	0.00*	104.11	10	0.00*
Family structure	4.01	2	0.17	5.09	2	0.21
Educational level	11.08	8	0.11	39.18	8	0.00*
Estimated monthly income	19.22	8	0.18	15.08	10	0.19
Present occupation	61.23	14	0.00*	89.55	14	0.00*
Nutritional status (BMI)	44.87		0.00*	72.54		0.00*

*Statistically significant ($p \leq 0.05$)

Table 4 present the relationship between nutritional status and functional capacity of the elderly in Ekiti State and other variable (sociodemographic and BMI). Significant association ($p < 0.05$) was observed between the level of functional capacity in BADL and age, present occupation as well as the BMI of the respondent while socio-demographic characteristics like gender, family structure, educational level and estimated monthly income of the respondents was not significantly associated with the level of functional impairment in the BADL. Similarly, significant association ($P < 0.05$) was observed between the level of functional impairment in IADL and age, educational level, present occupation as well as the BMI of the respondents while gender, family structure and estimated monthly income were not significantly associated.

Discussion

Some stringent factors were identified to have been associated with the nutritional status of the elderly in low income abd developing countries. Of these, functionalcapacity is one of the explanatory variables. This is in line with the position of Raji et al (2004) and Ajayi (2015). The current review evaluated the socio-segment and monetary qualities, nutritional status as well as the useful limit of the elderly in selected communities in Ekiti State. Socio-demographic and economic characteristicsaspects of the population such as age, gender,present occupation, estimated monthly income amongst other are part of the important factor that can beused in explaining differences in nutritional status.

Specifically, the prevalence or level of Functional incapacity varies worldwide and this variation may be due to dissimilarities in definition standards, methods and instrument used in evaluating functional capacity as well as sample characteristics. Basically functional capacity can be divided into two forms which are,Instrumental Activities of Daily Living (IADL) and Basic Activities of Daily Living (BADL). IADLgenerally require organization and planning more than BADL. The distribution of functional capacity in this study is consistent with other study (Tracey, 2008). In which higher prevalence of dependence in IADL was discovered. High prevalence of functional dependent in IADL observed in this study can be liked to their pooreducational attainment. This because these activities (IADL) require more physical, mental, educational and cognitive integrity compared toactivities of Daily Living (ADL).

However, this highlevel of functional dependent in IADL may not be an indication of high level of physical disability, as was substantiated by the fact that majority of the respondents were marginally dependent in performing these activities. Additionally, social insight and inclination of having some assistance in performing the greater part of the IADL could have likewise impact the respondent capacity in playing out a portion of these activities. Similarly, demanding for support and assistance which is a ~~und~~allowable practice among the older adult in African countries, regardless of their

capability in carrying out such activity or task may also be part of the contributing factor that is preventing them in performing various IADL as indicated by Ajayi (2015).

In concordance with other studies, Oliveira et al (2009) and Silveira et al (2007) significant association ($p < 0.05$) was observed between the level of functional impairment in Instrumental Activities of Daily Living (IADL) and socio-demographic and economic characteristics like; age, educational level and present occupation of the respondents. Specifically, significant association observed between the level of functional dependent in IADL and age of the respondents in the present study can be attributed to various age related changes that the elderly do experience, elderly are usually more fragile and prone to various chronic and acute disease which may affect their functional capability

Conclusion

The study investigated the nutritional status and functional capacity of elderly in selected communities in Ekiti State. The functional ability of the respondents was classified into two major categories: functional independent and functional dependent. Respondents with moderate and severe functional impairment was classified as functional dependent while those with no functional impairment (normal) was classified as functional independent. The study concludes that the high prevalence of functional dependent in IADL can be likened to their poor educational attainment probably due to the fact that these activities (IADL) require more physical, mental, educational and cognitive integrity compared to Basic Activities of Daily Living (BADL). However, the high level of functional dependent in IADL may not be an indication of high level of physical disability, as was sustainable by the fact that most elderly are usually dependent in performing these activities. Hence, functional impairment in IADL was more prevalent than BADL and level of functional impairment in IADL was significantly associated with socio- demographic and economic characteristics like; age, educational attainment and present occupation.

Recommendations

Based on the findings of the study, the following recommendations were made;

- Provide more educational opportunities for the elderly. This could help to improve their cognitive function and ability to perform IADLs. Educational programs could be offered in a variety of settings such as community centers, libraries, and senior centers.
- Create programs to help the elderly stay active and engaged. This could help to reduce the risk of functional decline and improve their overall health and wellbeing. Programs could include physical activity classes, social activities, and volunteer opportunities.
- Provide support services to help the elderly with IADL tasks. This could include home health care, transportation assistance, and meal delivery services. Support services can help to ensure that the elderly are able to maintain their independence and quality of life.
- Also, it is important to address the underlying factors that contribute to functional dependence in IADL, such as chronic diseases, poor health, and social isolation. By taking steps to address these factors, we can help to reduce the prevalence of functional dependence in the elderly and improve their overall quality of life.

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