

Effects of Socio-Economic Characteristics on Nutritional Status of the Elderly in Ilaro, Ogun State, Nigeria

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Abstract

The number of elderly is increasing worldwide, and malnutrition is not uncommon with the elderly due to poor socio-economic risk factors. This study assessed the effect of socio-economic characteristics on the nutritional status of the elderly in Ilaro, Ogun State, Nigeria. A Survey research design was adopted, and a structured questionnaire was used to explore the socio-economic characteristics and nutritional status of the elderly using an anthropometric measurement of height and weight to get the BMI of the elderly in Ilaro. Cochran sample size calculator and Cramer's *V* non-parametric test were employed in calculating the sample size of the association and confirmatory analysis of the strength of linear association existing between the nominal variables of socio-economic characteristics and elderly nutritional status, respectively. The Psychometric analysis showed that 50% of the elderly have average weight, 25% of them were overweight, 13% were obese, while 2% were underweight. On the strength of linear association between socio-economic characteristics and nutritional status of the elderly, only age, monthly income, and occupation have a significant effect on nutritional status. The confirmatory analysis using the Cramer's *V* test provided an efficient minimum threshold for suggesting a significant relationship between age, monthly income, occupation and nutritional status. This study has indicated that age, income, and occupation have statistically significant effects on the elderly nutritional status while other socio-economic characteristics of the elderly are considered, which is not limited to sex; religion, marital status, and educational qualification were not significantly related to nutritional status.

Keyword: Socioeconomic Characteristics, Nutritional Status, Elderly, Ilaro, Ogun State.

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1. Introduction

Aging' is a continuous process that is progressive and inevitable. The united nation agreed to use 60+ years as cut-off to refer to the aged population [1]. In many parts of the third world, the chronological time has little or no significance in the meaning of old age. The latter part of life in many third-world countries is seen to begin when active contributions are no longer possible [2]. Nutritional status is an essential part of physical and mental health for all age groups [3]. It is a measurement of the extent to which the individual's physiological needs for nutrients is being met [4]. As an individual ages, the nutritional needs and health concerns change due to growing vulnerability to diseases [5]. At first, diminishment of nutritional status may be disregarded in the elderly because the weakening of the body and weight reduction are considered to be process of aging [6]. Assessment of nutritional status involves anthropometric, biochemical data, clinical and dietary history [7]. Each of this method has some merits and limitations, and using of all of them to assess the nutritional status paints a whole image of a person's nutritional status.

Whilst anthropometric measurements are mostly used in assessing nutritional status, biochemical and clinical indicators are mostly applicable at extremes of malnutrition. Amongst the commonly used anthropometric measurements, body mass index (BMI, *hereon*) and mid-upper-arm-circumference (MUAC) are the most efficient. Furthermore, BMI (Body mass index) is largely accepted as a good indicator for the assessment of chronic energy deficiency of the adults including the elderly, in developing countries [8-9]. BMI as a strong correlation/association with fat and fat-free mass. Therefore, the protein and fat reserves of body can be estimated. In normal adults, the index is approximately constant, and a person with a low BMI is underweight. BMI is a person's weight in kilograms divided by the square of height in meters. Usually, high BMI indicates high body fatness, and a low BMI indicates too low body fatness.

If one's BMI is less than 18.5, it falls within the underweight range. Using the WHO standard, BMI can be classified as follows; between 18.5 and 24.9 indicates normal or healthy weight range; between 25.0 and 29.9 indicates an overweight range; and 30.0 or higher, indicates the obese range. However, this study uses anthropometrics to assess the nutritional status of the elderly in Ilaro town. An important factor influencing nutritional status in the aged is a decline in consumption of nutrient-dense foods. Other factors like socio-economic characteristics play a role in determining dietary intake [10]. For example, lack of money can adversely affect dietary consumption. In turn, poor consumption can lead to deficiency or excessive consumption of a particular nutrient thereby leading to more problems for the elderly. Because of the shoot up in number of elderlies throughout the world, including Nigeria, attention to the nutritional status of the aged is vital in order to improve their quality of life and health. For the purpose of this study the following personal and socio-economic factors were explored.

Income: In the thought of [11] money is another major obstacle for the aged to feed well and have optimal nutrition. Optimum nutrition is essential at all tier of life for maintaining good health and personal efficiency; it is especially beneficial to the aged because of the natural changes that occur in the body as people age. In the opinion of [12]. The elderly in third world countries is susceptible to health problems associated with poor income society, poor eating pattern, under nourishment, over nutrition, chronic illness and disease. Lack remains key contributory factor of many of the dietary related disorder among the aged [13]. Lower levels of economic resources are associated with a greater risk of experiencing hunger and food insufficiency among the [14]. Education According to [15], education influenced the nutritional status of rural women in Nigeria. The authors found that more educated women had significantly better health and nutrition knowledge, food habits, nutrient intakes, health, self-concept, and less adherence to detrimental cultural practices. As reported by [16], ignorance about food and eating can easily lead to under nutrition, and there is an increased risk of patients ending up in a vicious cycle

Age: The Center for Nutrition Policy and Promotion (CNPP) under United State Department of Agriculture (USDA) reported that with an increase in age, there is a small, but steady increase in the percentage of elderly with a poor diet or an indication of poor nutritional status. Also, several studies have reported that nutrient absorption and utilization may be diminished by age [17].

Gender/Sex: A Study conducted in the United States revealed that the majority of low socio-economic status older, rural adults consume diets that are poor or needed improvement, women were found to have higher mean healthy eating index scores than their male counterparts.

This present study aims at evaluating the nutritional status of the elderly in Ilaro town. This work will clearly reveal the socio-economic characteristics of the elderly as it affects their nutritional status using an anthropometric measurement of the elderly

2. Materials and Methods

Study Population, Sample size, and techniques

This paper adopts a survey research design. The inability of the researchers was unable to lay hands on the population of elderly in the study area, consequently, an infinite population was employed. Therefore, the Cochran sample size calculator was adopted. Based on the desire to reduce the risk of selecting a sample size that does not reflect the true population mean, the sample size was estimated at 90% level of confidence with maximum variability of 0.87 and a risk rate of 0.05. This was as a result of the relatively homogenous nature of the population with regards to the attributes of interest which were assumed to be normally and identically distributed. We express the sample size as;

$$n = \frac{z^2 pq}{e^2}$$

Where;

n = sample size; z = level of confidence desired

e = the sampling error, otherwise known as the desired level of precision

p = degree of variability and; $q = 1 - p$

Substituting the estimate given, we have

$$n = \frac{(1.645)^2 (0.87 \times 0.13)}{(0.05)^2} = 122 \text{ approximately.}$$

However, out of the 122 distributed research instruments for the target audience, 100 of the total instruments was returned, representing a response rate of 82%. The research materials comprise a structured questionnaire, Height-o-meter and weighting scale.

3. Data Collection Procedure

The standard questionnaire was administered with the following sections

- a) Socio –economic data
- b) Anthropometric measurements

Socio-Demographic and Economic Characteristics

Information on demographic and economic characteristic of the respondents was collected using the following age, educational level of the respondents, occupation, monthly income, religion, marital status and sex of the respondents.

Anthropometric Measurements

Data on weight and height measurements were recorded using standard procedures. In order to get the actual weight of individuals, respondents were in minimum clothing. A Seca-880 digital floor weighing scale was used to take weight measurement. This was done to the nearest 0.1 kg. Height was measured with the stadiometer set up against a vertical wall. Each of the respondents stood upright with their heels, buttocks, shoulders and the back of their head against the stadiometer. Each respondent was instructed to look straight ahead along the Frankfort plane, and the headpiece was lowered to touch the crown of their head gently but firmly and the readings recorded in duplicates to the nearest 0.1 cm. BMI was computed, and the respondents were classified as being underweight, normal, overweight or obese according to WHO standards.

4. Data Analysis and Results

The analysis was carried out using the Cramer's V non-parametric test of association for confirmatory analysis of the strength of linear association existing between the nominal variables of socio-economic characteristics and elderly nutritional status. This inferential analytical technique was used due to their robustness to distribution assumption, as the majority of the measure of nutritional status are ordinal in nature. The test statistic is expressed as;

$$Cramer's V = \sqrt{\frac{\chi^2}{n \times m}}$$

$$0 \leq Cramer's V \leq 1$$

Where:

χ^2 represents Chi-square test of independence statistic;

n represents the number of counts (frequency)

m represents $\min(\text{number of row, number of column}) - 1$

The value of zero (0) means there is no association between the variables while the value of 1 means there is a perfect association. Inferences on the elderly nutritional status were cross-tabulated with the associated socio-economic characteristics. The BMI of the elderly was measured based on their respective weight in kg and height in meter ratio.

Psychometric Properties of Data

Table 1 depicts the frequency and percentage analysis of elderly socio-economic characteristics. As evident from the table, the majority of the elderly, 51% were between the age of 55-65 years, while the minority 5% was 85 years and above. However, age bracket 66-75 years and 76-85 years constitute 29% and 15% of the total response, respectively. On the sex of respondents, the analysis showed that 49% of the elder were male while 51% of them were female. A majority of the elderly constituting 60% of the total percentage were Christians, 36% were Muslims while 3% constituting the minority were traditionalists.

Results also revealed that 77% of the selected elderly, indicating the majority were married, 5% were divorced, while 11% and 6% were widows and widowers. The response rate of the survey was 99%.

Table 1: Frequency and Percentage Analysis of Elderly Socio-economic Characteristics

Item nos.	Variables	Frequency	Percentage	
1	Age range	55 – 65	51	51
		66-75	29	29
		76-85	15	15
		85 and above	5	5
		Total	100	100
2	Sex	Male	49	49
		Female	51	51
		Total	100	100
3	Religion	Christianity	60	60
		Islam	36	36
		Traditional	3	3
		Total	99	99
		Missing System	1	1
		Total	100	100
4	Marital Status	Married	77	77
		Divorced	5	5
		Widow	11	11
		Widower	6	6
		Total	99	99
		Missing System	1	1
		Total	100	100
5	Educational Qualification	No education	11	11
		Primary Education	16	16
		Secondary education	18	18
		OND/NCE	25	25
		HND/BSc	28	28
		Others	1	1
		Total	99	99
		Missing System	1	1
		Total	100	100
6	Monthly income	₦ 10,000 - ₦ 20,000	29	29
		₦ 21,000- ₦ 30,000	20	20
		₦ 31,000- ₦ 40,000	9	9
		₦ 41,000- ₦ 50,000	15	15
		₦ 51,000- ₦ 60,000	20	20
		₦ 61,000 and above	4	4
		Total	98	98

		Total	97	97
		Missing System	3	3
		Total	100	100
7	Occupation	Retired	28	28
		Self-employed	33	33
		Petty trader	22	22
		Others	12	12
		Total	95	95
		System	5	5
		Total	100	100

Source: Researchers' Field Survey, 2020

Educational qualification of the target elderly as shown in item 5 indicated that 11% have no formal education, 16% have primary education, 18% have secondary education, and 25% were OND/NCE holders. In comparison, 28% were HND/BSc holders. This implies that majority of the respondents were HND/BSc holders. The overall response and non-response rate were 99% and 1%, respectively. On the monthly incomes of the respondents, the analysis of item 6 in table 1 above, showed that the monthly incomes vary with respondents as 29% of them earn between ₦10,000 - ₦20,000, 20% earn ₦21,000 - ₦30,000 on monthly basis, 9% earn between ₦31,000-₦40,000, 15%, 20% and 4% of them earn ₦41,000- ₦50,000, ₦51,000- ₦60,000, and ₦61,000 and above respectively with a non-response rate of 3%.

Taking the elderly occupation into consideration, the analysis showed that 28% of them were retired, 33% were self-employed, 22% were petty traders, while 12% of them were actively government or private companies' service.

Table 2: Descriptive Statistics of Elderly Nutritional Status

Variables	N	Minimum	Maximum	Mean	Std. Dev.	Skewness	Kurtosis
Weight (kg)	100	48.0000	91.000	69.870	9.966	.085	-.722
Height (m)	100	1.40	1.830	1.651	.091	.027	-.569
BMI	100	18.200	38.300	25.722	3.919	.646	.878

Source: Researchers' Self Computation

Descriptive statistics in Table 2 indicated that on average, the weights of randomly selected elders were estimated to be 69.87kg with variability of ± 9.966 with minimum and maximum of 48kg and 91kg, respectively. This implies that higher variation in the elder's weight is an indication that outliers may be present in the recorded weight as the range was found to be 43kg to the minimum and maximum weight. It cannot be overemphasized that half of the elderly suffered from malnutrition, as shown from the maximum BMI of 38.3kg/m² and an average of 25.72kg/m²(SD \pm 3.919). Furthermore, the distribution of the three covariates were found to be skewed and kurtic.

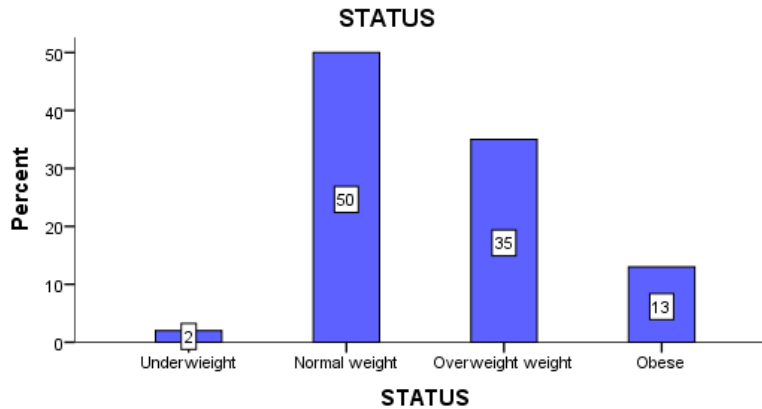


Fig. 1: Pictorial representation of elderly nutritional status

Pictorial representation of elderly nutritional status in figure 1 showed that 50% of the elders have normal weight as inferred based on the BMI threshold, 25% of them were overweight, 13% were obese while 2% were underweight. The implication of this is that half of the elders within the area of study were malnourished due to low income as shown from their monthly income which may not be able to cater for the nutritional foods that directly have an impact on their nutritional status. Hence, results of Cramer’s V test of linear association in table 4 depict the significant effect of individual socio-economic characteristics of the elderly on their nutritional status.

Table 3: Cramer’s V test of Linear Association between Socio –economic characteristics and Nutritional Status

Interacting Variables	Chi-Square			Cramer’s V		Remarks
	Value	df	p-value	Value	p-value	
Age*Status	20.296	9	.016	.260	.016	Significant
Sex*Status	2.146	3	.543	.147	.543	Not significant
Religion*Status	10.090	6	.121	.319	.121	Not significant
Marital status*Status	6.410	9	.698	.147	.698	Not significant
Educational qualification* Status	8.985	15	.878	.174	.878	Not significant
Monthly income* Status	19.207	15	.024	.257	.024	Significant
Occupation*Status	10.138	9	.039	.189	.039	Significant

Source: Researchers’ Self Computation

On the strength of linear association between socio-economic characteristics and nutritional status of the elderly, only age, monthly income, and occupation with Chi-square test statistic of 20.296 (p -value $0.016 < 0.05$), 19.207 (p -value $0.024 < 0.05$), and 10.138 (p -value $0.039 < 0.05$) respectively have significantly affected their nutritional status, as confirmatory analysis of the Cramer’s V value of 0.26 (p -value of 0.016), 0.257 (p -value of 0.024) and 0.189

(p -value of 0.039) at < 0.05 level of significance provides a good minimum threshold for suggesting a significant relationship between age, monthly income, occupation, and nutritional status. Hence, level of nutritional status of the elderly is said to be influenced by the aforementioned variables. It is also evidenced from the chi-square test statistics of 2.14 (p -value $0.543 > 0.05$), 10.090 (p -value $0.121 > 0.05$), 6.410 (p -value $0.698 > 0.05$), and 8.985 (p -value $0.878 > 0.05$) that sex, religion, marital status and education qualification respectively do not have significant effect on the elderly nutritional status, as confirmatory analysis of the individual variables Cramer's V value of 0.142, 0.319, 0.147 and 0.174 with associated p -values > 0.05 level of significance do not provide good minimum thresholds for suggesting a substantive relationship between the individual aforementioned variables of on elderly nutritional status.

5. Discussion and Conclusion

In the present study, a majority of the elderly were within the age group of 55-65 years. This is in agreement with the opinion of [1] which states that the united nation agreed to use 60+ years as cut off to refer to the aged population This is also consistent with the earlier report of [2] which stated that in the first world countries, chronological time plays an important function, the ages of 60-70 approximately equipped to retirement age and is said to be the beginning of old age. A majority of the respondents is female (about 51%). This may be as a consequence of more women participating in the study. In assessing the religion and marital status of the elderly majority are Christian (60%), (77%) are married. A mixed pattern was found in the educational status of the elderly because their educational qualification ranges from no primary education to HND/BSc respectively. According to [15], education influenced the nutritional status of rural women in Nigeria. Their study found that more educated women had significantly better health and nutrition knowledge, food habits, nutrient intakes, health, self-concept, and fewer adherences to detrimental cultural practices.

In the opinion of [16], ignorance about food and eating can easily lead to undernutrition, and there is an increased risk of patients ending up in a vicious cycle. The observations are almost similar to the study conducted by [18] in which a majority of the participants were within the age group of 60-69 years (65%) followed by female (55%) having the highest frequency. A majority of the respondents earned as low as between ₦10,000 - ₦20,0000 as monthly stipends. This is consistent with the opinion of [14] which states that Lower levels of economic resources are associated with a greater risk of experiencing hunger and food insufficiency among the elderly. Also, in agreement with [10], economic factors take part in ascertaining dietary intake as financial distress can cause low morale, which in turn contrarily affects dietary consumption. Corroborated by [11], wages are key constrain for the aged population to feed well and have optimal nutritional status, compatible with the belief of [12], which states that older adults in third world countries are vulnerable to health predicaments associated with the low-income society and, relevant to the school of thought that scarcity of means of sustenance is a significant contributory factor to many of the food associated disorder among the elderly.

Pictorial representation of nutritional status revealed that half of the respondents (50%) have normal nutritional status, while the rest are malnourished. This is corroborated by the descriptive statistic table of the elderly, which reveals that half of the elderly suffered from malnutrition, as shown from the maximum BMI of 38.3kg/m² and average of 25.72kg/m²(SD±3.919). This is consistent with the thought of the National Institutes of Health (2013) which states that; BMI less than 18.5 falls within the underweight range; BMI of 18.5 to 24.9 falls within the normal or healthy weight range; BMI of 25.0 to 29.9 falls within the overweight range and BMI of 30.0 or higher, falls within the obese range. In the opinion of [16], ignorance about food, and eating can easily lead to undernutrition. There is an increased risk of patients ending up in a vicious cycle. This study has indicated that age, income, and occupation have a significant effect on the elderly nutritional status while other socio-economic characteristics of the elderly considered which is not limited to sex; religion, marital status, and educational qualification were not significantly related to nutritional status.

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