Original Article

Socio-demographic and nutritional assessment of the elderly Yorubas in Nigeria

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Three hundred and five Nigerian elderly from the Yoruba tribe of both rural and urban areas in the south Western zone of Nigeria were studied. The objective was to assess their nutritional status and identify indicators of nutritional vulnerability. Using a structured household questionnaire, anthropometric measurement and checklist of nutritional vulnerability, nutritional status was assessed and classified into various levels of vulnerability. The demographic characteristics showed that half of the population studied were between 60–69 years, 53% male, 61% married and 58% had no formal education. Based on Body Mass Index (BMI), more than half of the respondents had an acceptable nutritional status with a BMI between 18-25 (63% male; 58% female) whilst 15% of the males and 14% of the females were underweight with BMIs below 18 and 3% of the males had severe malnutrition (BMI below 15). According to the nutritional vulnerability checklist, only 10% of the males and 4% of the females were not nutritionally vulnerable. The majority were either moderately vulnerable or (50% male; 50% female) or highly vulnerable (39% male and 46% female). Stepwise regression analysis identified ten factors contributing to nutritional vulnerability in the elderly: environmental health; food intale, food security; family life; psychological situation; functional capacity; health status; economic situation; alcoholism; and bereavement, with the coefficient of multiple determination of 0.94 at $P<0.05$ ($R=0.94$ $P<0.05$). In conclusion, under nutrition was common among the Yoruba elders and women were more vulnerable than men.

Key Words: sociodemographic, nutrition, vulnerability, assessment, food security, Yoruba elderly, Nigeria.

Introduction

Peoples demographic characteristics, socioeconomic condition, adequate and appropriate nutrition, access to basic social amenities such as food, water and electricity have been found to be highly correlated to health and nutrition status.[1] Factors such as age, gender, township status and ethnicity, which are fundamental to demography, can contribute in one form or the other to the quality of life and nutritional status of the elderly. Ismail's[2] work on nutriational assessment in Africa, observe that some older people in developing countries enter old age after a lifetime of poverty and deprivation, a diet that is inadequate in quality and quantity and a lifetime of disease and poor access to health care. Nigeria, like other countries in Africa with a similar socioeconomic condition, is not an exception to the poor health of the elderly. Despite this poor situation the statistical projection in Nigeria between 1990 and year 2025 showed an increase in the numbers of elderly people.[3]

By 2025 there will be an increase of over 80%, with more women at a ratio of 1 to 1.2. Furthermore it was clear from the projection that the elderly population in Nigeria would be double by 2015. In this transition there should be adequate nutrition, healthy ageing and proper functional ability to preserve a minimum quality of life. It becomes obligatory to plan to meet the challenges of this future increase. Nigeria, like other countries in Africa, still needs an information data base which would be specific for those aged 60 years and above. This data base could be used for planning and solving their various socioeconomic and nutritional problems. This paper focused on the sociodemographics as they affect the nutritional status of the elderly among the Yoruba tribe in southwest Nigeria.

Methodology

Areas of study and sampling procedure

The areas selected for this study are four local government areas in Yoruba speaking states of the southwestern region of Nigeria. The Yorubas are the major tribe, predominantly living in the southwest, with occupations ranging from large-scale business to petty trading. Some are involved with agricultural practices, such as crop farming (especially cassava, yam and plantain), vegetables, poultry and livestock, mostly small ruminant animals.[4]

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Sampling procedure

The population targeted for the study comprised the male and female elderly among the Yoruba tribe of south-west Nigeria. To be eligible for inclusion in the survey, each prospective respondent was required to have attained the minimum age of 60 years and must have resided in the study area for at least five years continuously. Ogun state (one of the five states of the southwest where the Yoruba people were concentrated) was randomly selected as the study area. A multistage sampling procedure was adopted.

Selection of urban and rural setting within the study area

The stratified sampling for urban and rural was adopted for comparative purposes. In Ogun state there are three ethnic groups within the Yoruba tribes (namely the Egbas, the Ijebus and the Yewas). Therefore the selection of communities was based on ethnic considerations such that each of the dialect (ethnic group) represented a zone. In each zone, a town was randomly selected to represent the urban setting (after considering the population, the infrastructure and the presence of other social amenities) and one village was randomly selected to represent the rural setting. In all, three towns and three villages were selected for uniform representation of the Yoruba's since each group (ethnic) differs in their type of Yoruba dialects.

Selection of household

In each of the purposively selected communities, 100 households were selected using systematic random sampling to represent each zone with a sub sample of 50 households in urban and 50 households in rural strata. A total of 300 households were randomly selected from the three zones.

Selection of respondents from households

At least one respondent was selected which must have attained the age of 60 years or more of the selected households. This sampling option was considered expedient in the absence of valid and comprehensive sampling frame in each zone. This approach was found to be culturally expedient and ensured maximum cooperation of members.[5,6] The total number of respondents studied came to 305.

Instrument for Data collection

Questionnaire method

Demographic information was collected using structured household questionnaire while the non-demographic characteristics were by interview.

Measurement of socioeconomic status

The subjects were scored for socioeconomic status using factors such as level of income, property ownership, control of household income, employment status, and level of education to score the respondents and classify them into low, moderate and high socioeconomic status.

Measurement of health status

The health status was measured using self-reported method. The elderly were scored for body ailments i.e. when there were no body ailments this was classified as "good" where there were 1or 2 body ailments, this was classified as "fair" and more than 2 was classified as "poor". The elders with the highest scores were considered to be in good health.

Anthropometric measurement

Anthropometrical data of the elderly was obtained using international standards and procedures.[7,8] Heights of the elderly were taken using a locally produced stadiometer, whilst weight was measured using the sensitive Henderson bathroom scale.

Measurements for nutritional vulnerability

Nutritional vulnerability was measured by applying a checklist modified from the Nutrition Screening Initiative.[9,10] The checklist was modified to suit the environment in Nigeria, with additional parameters such as presence or absence of fuel, water supply, and electricity. These parameters were included because of their potential to expose people to irregular eating habits. A total of fifty items was assessed and each item was scored one point if the subject was vulnerable. Hence a maximum of fifty points was possible for the vulnerable elderly if all items scored in the checklist. The scores show the degree of vulnerability i.e. the higher the score the more vulnerable the person was likely to become. In interpreting the scores of different respondents, the standard of the Nutrition Screening Initiative was adopted where 10% was regarded as not vulnerable, 10-30% as moderately vulnerable and >40% as highly vulnerable.

Results

The socio-demographic characteristics of the sampled elderly are shown in Table 1. The mean age was 71 years with a range from 62 to 102 years. The distribution followed the WHO elderly classification.[1] About 50% of the respondents were aged 60-69years, 15% 75-79 years and 18% 80years and above. The age assessment was determined chronologically. Another important demographic characteristic is gender. Fifty three percent were male while 47% were female. The mean household size was 6 ± 4 whilst their years of residence was 34 ± 22. The family structure revealed that the total number of households with monogamous couples was 118 whilst 187 were polygamous (Table I). The mean number of children in all the family types was six, however the household size was higher in polygamous (6 ± 2) than in monogamous (4 ± 2) families. This is not surprising since polygamy usually leads to increase in household size and hence becomes a major factor in population increase.

About 60% of the respondents were married whilst 31% were widowed. A relatively small percentage of the subjects were single, either because of divorce (3%) or separation (5%). In this study, the majority of the widowed were women (56%). About 58% did not have any formal education, with 10% having tertiary education and 19% primary education.

Table 1. Demographic characteristics for the elderly studied

Variable	Frequency	Percentage
Gender		
Male	153	53
Female	142	47
Age structure		
60-64	74	24.3
65- 69	74	24.3
70 –74	55	18
75 –79	46	15
80+	56	18.4
Family Structure		
Monogamy	118	39
Polygamy	187	61
Educational level		
No formal education	177	58
Primary education	58	19
Secondary/Technical	40	13
Tertiary education	30	10
Marital status		
Married	186	61
Widowed	95	31
Divorced	15	5
Separated	9	3

Table 2. Distribution of respondent by degree of nutritional vulnerability scores

Scores	Male		Female	Total
	N	%	*N*	%
0-5 *not vulnerable*	17	10	6	4
6-14 *moderately vulnerable*	82	50	71	50
15-50 *highly vulnerable*	64	39	65	46
Total	163	100	142	100

Based on a a checklist modified from the Nutrition Screening Initiative.[9,10]

Table 3. Percentage distribution of the elderly by nutritional status

	Males		Females	
BMI kg/m^2	*N*	%	*N*	%
18-24.9 normal	103	63	82	58
<18-16.9 underweight	25	15	20	14
<17 moderate malnutrition	2	1	1	1
<15 severe malnutrition	5	3	4	3
>25-29.9 over weight	23	14	25	18
>30 obese	5	3	10	7
Total	163	99	142	101

It is very clear in this distribution that majority of the elderly have low educational attainment (Table 1). The scores on socio-economic status highlight that 24% are in moderate socio-economic status and 15% are in high socio-conomic status.

The self reported health status is such that 13% categorized themselves into poor health status, while 32% rated their health as good compared to others in their age groups whilst the majority scored themselves as fair (54%). The degree of nutritional vulnerability is shown in Table 2. Only 10% of the males and 4% of female subjects were not vulnerable. The majority of the respondents fell into the category of moderately vulnerable (50%) or highly vulnerable (46%). Table 3 shows the distribution of nutritional status by Body Mass Index (BMI). More than half of the population studied was within the normal nutritional status range (63% male; 58% female). Prevalence of 'underweight' was 15% for men and 14% for women, and 3% were severely malnourished. The percentage of over-nutrition indicated by over-weight was 16% while the obese contributed only 3% for men and 7% for women.

Discussion

Socio-demographic characteristics and nutritional status

Demographic aspects of the population such as age, gender and township status are all factors that may explain the differences in nutritional status. Information on age in this study has helped in ranking the elderly into ages 60 years and over. It is from data on age that demography allows one to track changes in size of population and changes to nutritional status. Age is an essential factor in recommended dietary allowances and the elderly nutritional status. For instance, age of the respondents in this study correlated negatively with body mass index in both male and female respondents respectively (r =-0.23; P<0.05 r=-0.29; P<0.05) (Table 6). The reason for this is not far fetched as most authors had already predicted the effect of age increase on lean muscle mass.[12,13] The authors in this study also observed a decrease in body weight at advanced ages (r =0.30, P<0.05). The elderly were also observed to have chewing problems as age advanced (r=0.30, P<0.05), physical disabilities (r=0.20, P<0.05), memory loss (r=12, P<0.05) and an increase in their level of nutritional vulnerability (r=0.27, P<0.05) (Table 6).

The other important demographic characteristic is the gender distribution. Gender classification is very essential in understanding the current situation of the elderly. In this study there are comparisons by gender in some socio-demograghic variables, such as income and overall socio-economic status score. It is clear in Table 5 that the males had significantly higher incomes, higher socio-economic status scores and were also less vulnerable than the females (P<0.05). In this type of classification it is easier to identify the weaker group. The Gender distribution in this study revealed the nutrition situation of males and females differently. For instance, the overall nutritional vulnerability score was significantly higher in females

Table 4. Results of stepwise regression analysis of factors contributing to the nutritional vulnerability of the Yoruba elderly

Variables	B	SEB	t	*P*
Bereavement	.84	.13	6.43	0.05
Alcoholism	.95	.14	6.53	0.05
Economic situation	.81	.06	13.55	0.05
Family life	1.17	.05	19.80	0.05
Environmental health	.94	.03	26.68	0.05
Food intake	.71	.03	18.14	0.05
Functional ability	.81	.04	16.59	0.05
Food security	1.03	.04	20.78	0.05
Health status	.84	.05	15.46	0.05
Psychological situation	.98	.05	16.87	0.05
(Constant)	1.06	.19	5.30	0.05

Table 5. T-Test for independent samples of nutritional assessment by sex

Variables	Means			
	Males	Females	t	*P*
BMI	21.9	22.3	48-7	0.45
MUAC	28.72	28.84	-0.22	0.84
Income (Naira)	5003	2481	5.3	0
Vulnerability score	13	15	-2.35	0.01
Socioeconomic status score	16.6	14.3	3.04	0.003
Health status score	2.2	2.23	3.71	0.71

Multiple R 0.96; R^2 0.94 ; R^2 (adjusted) 0.93; Standard error 0.73; F-ratio 430.04; Significance (*P*) 0.05; Equation Function: Nutritional vulnerability f (X_1 +X_2….X_{10}); Where X = Variable's Beta. t = student t-test <2; B = beta; SE = Standard error R^2 = coefficient of multiple determination

(15>13; *P*<0.05) than in males (Table 5). This may be traced back to the socio-economic and cultural environment, where the mean income is higher for men than women (Table 5). Many authors have also traced the poor socioeconomic status of Nigerian women to their culture, whereby African men have domineering control over resources.[14-16] In Africa as well as in Nigeria, the historical and socio-cultural domination of men is now recognised to have an intergenerational effect on women's access to social, economic, property and political prosperity.[14,16] For instance, in Nigeria the discrimination in property inheritance law has a greater impact on women than on men.[14] This situation has contributed to women having a high level of poverty, economic dependence, limited decision making power and negative cultural attitudes.[14] It is not surprising that among the Yoruba elderly women, 77% are without house or land property. This cultural practice has made the Yoruba women distanced from the main stream of economic resources, resulting in their adverse socio-economic condition and, in turn, their nutritional vulnerability. Hence this information on gender further gives a logical component in development of programmes that seek to organize individuals who have been marginalized to demand for their right in the community.[15,17]

Town-ship status of the elderly also contributed to nutritional status. For example, the majority of illiterate and those of polygamous families were in the rural areas. The overall socio-economic status was also higher among the urban elderly studied than the rural elderly. For instance, 72% of those in the low socio-economic status group, 88% of the elderly in the lowest income per month group and 65% of those without property were all from the rural areas.

Nutritional assessment vulnerability and socioeconomic condition of the elderly

The interaction of nutritional status with the vulnerability index and the socio-economic condition was very clear in the bivariate analysis and stepwise regression. A positive relationship was observed in certain socio-economic variables, such as income (r=0.31, *P*<0.05), level of education (r=0.25, *P*<0.05) and BMI (Table 6). Furthermore, the differences in income among ethnic groups of the Yoruba tribe, where the 'Ijebu' had higher incomes, also translated into significantly higher body mass indices in both males and females respectively (23.4 kg/m2; 23.1kg/m2) (F ratio 12.1, *P*<0.05).

The various factors contributing to the level of nutritional vulnerability, as identified using stepwise regression, were environmental, food intake, family life, food security, psychological situation, functional ability, health status, economic life, bereavement and alcoholism. These factors were observed to contribute highly to elderly nutritional vulnerability scores. The principle of this regression analysis was based on the fact that the nutritional vulnerability of the elderly is a function of their exposure to the ten factors identified in Table 4.

This situation can also be confirmed in the bivariate analysis of BMI/sanitary houses (r =0.34; *P*<0.05), BMI and the overall nutritional vulnerability (r=-0.35; *P*<0.05). The extent to which environmental qualities such as reduced pollution (air, water and soil), access to water supply, electricity and fuel - as they affect cooking and feeding among the elderly - is noteworthy to nutritional status. Evidence is growing on numerous factors in the home environment that may influence health negatively. WHO[17] identified that "unhealthy" housing conditions leading to high disease burden in both urban and rural areas are key indicators of health status. Housing factors such as high noise levels, poor air quality, inadequate refuse, storage and collection, overcrowding, poor electricity supply, poor food preparation and storage, temperature extremes and high humidity, building defects and pests, may influence health, thus making individuals vulnerable.[19] In Nigeria, the level of exposure to these environmental factors is very high which is a reflection of the national situation. According to Federal Office of Statistics, only 18.5% of households in Nigeria had access to pipe borne water and the majority of these houses are concentrated in the southwest region. In 1990, 9.1% of

the houses in Nigeria used modern flush toilets and only a small percentage had adequate refuse disposal.[20]

Additional factors recognized to influence the nutritional vulnerability of the elderly in this study were: food intake; family life; economic situation and health status. Food intake may be a surrogate measure of direct variables which affect food preparation, such as cooking fuel and equipment. The effect of poor food intake on the level of nutritional vulnerability is enormous. Inadequate dietary intake due to individual attitudes and habits can lead to malnutrition and poor health status.[21-23]

Other causes contributing to the nutritional vulnerability of older people, such as psycho-social factors and alcoholism, influence food intake both directly and indirectly. Psycho-social factors in the elderly were measured in terms of family care, isolation, caregivers and dependants. All these features do have a direct effect on food, appetite and wellbeing of old people. An additional variable in the regression is bereavement which some of the elderly confessed that the loss of a loved one affects their food intake, contributing to their vulnerability.

Off particular importance is family life in the overall well-being of the elderly. The situation of some elderly in this study revealed inadequate home care; some homes were observed imbibing western culture in view of modern technology. The care of older people within the family unit, was guaranteed in Nigeria, even in Africa, until recently. With modernization, urbanization and industrialization the care of the elderly has changed.[14,24] All these have led families to live great distances apart, communicating through modern technology such as telephone, but with less opportunity to help each through physical proximity.

Furthermore, socioeconomic change such as low incomes with adverse exchange rates of the local currency may weaken the family's ability to provide adequately for its family in Africa.[24] The inadequate care of the elderly has led to social isolation, contributing to reduced food intake, with an increased risk of malnutrition. In Nigeria many elderly face high inflation rates and low credit and are discriminated against in terms of employment opportunities. Another factor in nutritional vulnerability is health status. Poor health may make some older people more dependent with disabilities and hence reduced functional capacity. This has also been observed by Ismail in Africa.[2] He associated poor functional ability with poor nutritional status in three developing countries in Africa (Malawi; India and Rwanda). This study has further shown the interaction of demographic characteristics and socio-economic environment in nutritional vulnerability.

Table 6. Pearson product moment correlation of socio-demographic variable and nutritional status *N*=305

Variables	Male	Female	Total
Income - *BMI*	0.31	0.21	0.31
Education - *BMI*	0.4	0.09	0.25
Age			
BMI	-0.23	-0.29	-0.21
body weight	-0.3	-0.31	-0.3
MUAC	-0.2	-0.23	-0.21
chewing problem	0.3	0.3	0.3
Memory	-0.12	-0.13	-0.12
vulnerability score	0.27	0.28	0.27
education level	-0.22	-0.26	-0.24
physical disability	0.2	0.22	0.2
Alcoholism	-0.12	-0.1	-0.1
BMI - *sanitary houses*	0.35	0.34	0.34
Vulnerability score - *BMI*	-0.35	-0.38	-0.35
Education - *income*	0.55	0.56	0.56
Socioeconomic status			
access to water	0.3	0.32	0.31
vulnerability score	-0.23	-0.26	-0.24
education	54	0.52	0.53
bodyweight	0.38	0.36	0.37
Health score			
BMI	0.21	0.22	0.21
vulnerability	-0.3	-0.31	-0.3

Conclusion and recommendations

Yoruba elderly in Nigeria are malnourished and nutritionally vulnerable where socio-economic status is low. The various conditions which contribute to nutritional vulnerability include environmental health, family life, food security, psychological situation, functional capacity, health status, economic situation, alcoholism and bereavement. When considering the effects of socio-economic and environmental factors on the nutritional status of the elderly, special attention should be paid to environmental problems such as sanitation, care givers, access to fuel and improved family life. There is an urgent need for programmes specific for the elderly in Nigeria, that would improve their food intake, functional capacity and economic status.

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尼日利亚中老年优鲁巴人的社会人口统计及营养评估

本研究以 305 位生活在尼日利亚西南地区城乡中的优鲁巴人为对象，评估了他们的营养状况，并确定了营养薄弱的影响因素。采用结构家庭问卷、人体测量和营养薄弱清单，评估了营养状况并将其分成不同水平的营养薄弱。人口统计特征表明受试者中有一半年龄在 60～69 岁，其中 53％为男性，61％为已婚，58％没有受过正规教育。根据体重指数（BMI），超过半数（63％男性，58％女性）的反馈者 BMI 为 20～25 kg/m^2， 具有正常的营养状况，同时有 15％的男性和 14％的女性 BMI 低于 20 kg/m^2，体重偏轻，3％的男性 BMI 低于 18 kg/m^2，属于重度营养不良。根据营养薄弱清单，仅有 10％的男性和 4％的女性不属于营养薄弱。大多数人或是中度营养薄弱（50％男性，50％女性），或是高度营养薄弱（39％男性，46％女性）。利用逐步回归分析(R=0.94 $P<0.05$)，确定了十种促成中老年人营养薄弱的因素：环境卫生、食品安全、家庭生活、食品摄入、心理状况、健康状况、经济状况、酗酒、哀丧。总之，在中老年优鲁巴人群中存在着营养不足的现象，同时女性比男性更为营养薄弱。

关键词：社会人口统计的、营养、薄弱、评估、食品安全、中老年优鲁巴人、尼日利亚。