Journal of Dietitians Association of Nigeria (JDAN) Volume 14. December 2023. Print ISSN: 2141-8209; eISSN: 2635-3326 Available online at: https://www.ajol.info/index.php/jdan/index

Assessment of Dietary Habits, Nutritional and Emotional Status of Elderly in Mushin Local Government Area, Lagos State

***Elizabeth O. Ngozi [1], Julius O. Maitanmi [2], Olubunmi B. Akinsanya [3], Bukola T. Maitanmi[4], Babafemi T. Ogunbiyi[5], Michelle O. Oleah [1], Olajumoke A. Oyedeji[3] Taiwo B. Adegboye [1]**

[1] Department of Nutrition and Dietetics, Babcock University, Ilishan-Remo, Ogun State Nigeria.
[2] Department of Community/Public Health Nursing, Babcock University, Ilishan-Remo, Ogun State Nigeria.
[3] Department of Food Science and Technology, Bells University of Technology, Ota, Ogun State Nigeria.
[4] Department of Mental Health/Psychiatry Nursing, Babcock University, Ilishan-Remo, Ogun State Nigeria
[5] Department of Biochemistry, Babcock University, Ilishan-Remo, Ogun State Nigeria.

***Corresponding author:** NGOZI Elizabeth Oluwafunmiso
Postal address* Babcock University, PMB 21244 Ikeja, Lagos,
ngozie@babcock.edu.ng

DOI: https://dx.doi.org/10.4314/jdan.v14i1.3

ABSTRACT
Background: Old age is the final stage of the life cycle, characterized by functional decline and increased susceptibility to disease. Dietary habits, nutritional and emotional status have been shown to partly determine the quality of life of the elderly.
Objective: This research assessed the dietary habits, nutritional and emotional status of the elderly.
Methods: A structured questionnaire was used to obtain the socio-demographic characteristics as well as the dietary habits of the elderly. The mini-Nutritional assessment tool was used to determine the prevalence of malnutrition and Geriatric Depression Scale was used to identify depression among the elderly. Pearson's Chi test was used to establish the association between Nutritional status and emotional status.
Results: The assessment of the socio-demographic characteristics of the elderly showed that the majority (52.1%) were male, 32.4% were between the ages of 60-64 years and 81.7% were living with someone and quite a number (39.4%) lives with their spouse. The results of dietary habits assessment showed that most (69%) of the elderly ate at home with lunch as the most frequently eaten meal with 47.9% of the elderly preferred to eat lunch. The prevalence of malnutrition and depression among the elderly was found to be 11.3% and 50.7% respectively. At $p < 0.05$, no significant correlation existed between nutritional status and emotional status.
Conclusion: Elderly habits of eating at home result in low cases of malnutrition but they still go through depression on average as they mostly live alone.

Keywords: *Dietary habits, nutritional status, emotional status, elderly.*

INTRODUCTION

Aging has been defined as "a persistent decline in the age-specific fitness composition of an organism due to internal physiological deterioration" (1). During aging, there are decline in efficiency and strength. Also, susceptibility to diseases and infections is on the rise (2). Physiological, pathological, and psychological alterations are common among the elderly which involve a decline in sensation (sight, taste, smell, etc.) which may in turn alter food preferences thus leading to a higher risk for undernutrition. Hence, there is an increased need for medical care (3).

Individual changes during aging make meeting nutritional requirements a demanding process due to morphological and biochemical changes observed within their degenerated tissues and organs. Furthermore, the aging process affects gastrointestinal function by decreasing the secretion of gastric acid, and pepsin which is necessary for digestion to occur, especially vitamin B_6, folate, iron, and calcium thus reducing their bioavailability (4, 5, 6).

The selection of foods suitable for their aging process also is a problematic process as the nutritious foods sometimes might be unavailable or may face economic stress. In the elderly, the inability to move around as a result of aging complications such as osteoarthritis may also affect their daily activities which include walking, shopping, and cooking, thus preventing them from meeting up with their usual nutritional delicacies (7). These systematic changes during aging such as loss of

appetite and immobility may adversely affect the emotional stability of the individual (8).

Furthermore, the isolation and loneliness faced by the elderly can also create huge challenges on their diet and health status especially those experiencing the death of a spouse or being neglected by their family members and friends. They sometimes experience depression which also dampens their will to eat and live healthy lifestyles. Depression is one of the leading causes of involuntary weight loss in the elderly. In Nigeria, determinants of psychosocial health include gender, death of a spouse, cultural values, and health status before 60 years (9, 10).

Eating the right proportion of food with the right classes of nutrients helps the body reach its maximum potential for growth and development. During the aging process, there is a decline in the utilization of these nutrients, thus care must be taken to ensure the consumption of what the aged body needs at a time. Macronutrients and micronutrients are very important parts of our foods. The macronutrients are carbohydrates, fats, and proteins needed for energy and the building of body structures and other systems while micronutrients are vitamins and minerals nutrients that are necessary for normal functioning of the body. Vitamin B_{12}, B_9, vitamin D, and B_6 are required especially by the elderly (11). The body cannot make vitamins on its own, so a deficiency may result in the development of diseases such as obesity, cancer, diabetes, and osteoporosis among others, in the elderly (12, 13). Several nutritional deficiencies, such as vitamin B_{12}, B_9 (folate), and zinc, can cause symptoms of depression and dementia such as low mood, fatigue, cognitive decline, and irritability (14).

To ensure the optimal nutritional status of the elderly, assessment must be done on an individual basis after which practicable advice must be given about food choices while taking into account certain factors such as physiological and physical condition, activity level, medications in use, food preferences, income level, cooking facilities and ethnic group among others (15). There are four components of nutritional assessment, they include; anthropometric assessment, biochemical data assessment, clinical data assessment, and dietary data assessment. The single most universally acceptable, inexpensive, and non-invasive method of assessing the size, proportion, and composition of the human body is anthropometry (16). Anthropometry in the elderly consists of the measurement of weight, height, hip circumference, waist circumference, arm circumference, thigh circumference, calf circumference, and skinfold thickness (17). Mid-upper arm circumference is a helpful indicator of malnutrition in ill patients. The elderly are prone to various ailments which may affect their ability to stand and thus evaluate their height, various means, such as the heel-knee length and demi span have been devised to accurately measure their height (18). Another anthropometric assessment is a measurement of the Body Mass Index (BMI). It relates weight (kg) to the square of the height (m^2) of the individual (19). It is measured to identify those people who may be suffering from malnutrition which could be under-nutrition or over-nutrition

A major factor that affects many chronic diseases is diet (20). Methods of assessing the dietary habits of individuals include diet records, 24-hour dietary recall, and food frequency questionnaires. Computer technologies have been developed to carry out a more efficient dietary assessment. Examples are the Automated Multiple Pass Method (AMPM) and the European Prospective Investigation into Cancer and Nutrition study (EPIC-Soft) (20, 21). This research investigated the dietary habits, nutritional and emotional status of the elderly in the Mushin local government area of Lagos State.

MATERIALS AND METHODS

Study Design and location

The study was descriptive and cross-sectional. It was carried out in Mushin local government of Lagos State.

Sample size Calculation

As of 2006, about 631,857 people were living in Mushin local government. We have 326,873 males and 304,984 females and among these groups, those that were 60 years and above were said to be 30,733 (22).

The sample size was calculated using the extended proportion (23)

$$N = \frac{Z^2\, p\, (1-p)}{d^2}$$

Where N is the sample size,

Z is the standard normal variate = 1.96,

P is the prevalence of malnutrition among the elderly = 7.8% according to (24), and d is the level of precision = 0.05.

The calculated sample size was 110.48 but was increased by 30% to obtain a more dependable result, giving a total of 142 respondents.

Ethical Approval/ Informed Consent

Letter of approval was obtained from the Chief Medical Director of Mushin local government area hospital and the respondents who took part in this study gave verbal consent.

Data Collection

A structured questionnaire was used for data collection. It inquired about their socio-demographic background which includes age, sex, religion, ethnicity, marital status, education level, occupation, living situation, level of income, and dietary habits. Their nutritional status was obtained using the Mini Nutritional Assessment tool, Emotional status was determined by using the Geriatric Depression Scale (1986) as used by (25), and health challenges and food frequency were also obtained.

Anthropometry

Anthropometric measurements were taken by measuring the body weight (without shoes while wearing light clothing) with the aid of a measuring scale to the nearest 0.1 kg and a heightometer was used to measure the height of the respondents. For patients who were not able to stand upright, a measuring tape was used to measure the demi span (the sternal notch to the tip of the middle finger in the coronal plane), after which, their height was calculated using the Bassey equation (26).

Data analysis

The data obtained was entered into a computer and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0. The variables were tested for independence using Pearson's Chi-square test.

RESULTS

The socio-demographic results depicted in Table 1 indicated that some of the elderly (32.4%) were between the ages of 60-64 years. More than half of the elderly (52.1%) were male while 47.9% were female. Only 5.6% of the elderly were single, the majority (60.6%) were married, 8.5% were divorced or separated and 25.4% were widowed. Many (56.3%) were Christians while the remaining 43.7% were of the Muslim faith. Most (77.5%) were Yoruba. The minority of the respondents (18.3%) lived alone while the majority (81.7%) do not. About 39.4% lived with their spouses, 36.6% lived with their children and 5.6% lived with a help

Table 1: Socio-demographic Characteristics of the Elderly Respondents.

Variable	Frequency (N=142)	Percentage
Age		
60-64	46	32.4
65-69	22	15.5
70-74	14	9.9
75-79	42	29.6
80 years and above	18	12.7
Sex		
Male	74	52.1
Female	68	47.9
Marital Status		
Single	8	5.6
Married	86	60.6
Divorced/separated	12	8.5
Widow/Widower	36	25.4
Religion		
Christian	80	56.3
Muslim	62	43.7
Tribe		
Igbo	24	16.9
Yoruba	110	77.5
Hausa	6	4.2
Others	2	1.4
Level of Education		
O'Level	40	28.2
OND	6	4.2
HND	10	7.0
B.Sc.	42	29.6
Masters	14	9.9
Ph.D.	2	1.4
Others	28	19.7
Occupation		
Businessman	34	23.9
Civil Servant	26	18.3
Public servant	10	7.0
Trader	34	23.9
Retired	38	26.8
Income		
<25,000	22	15.5
25,000-50,000	28	19.7
51,000-100,000	58	40.8
101,000-200,000	22	15.5
>200,000	12	8.5
Live Alone?		
Yes	26	18.3
No	116	81.7
Live With?		
My spouse	56	39.4
My child/children	52	36.6
A help	8	5.6
Others	26	18.3

Their dietary habits in Table 2 showed that more than half (69%) of the respondents preferred eating at home while the remaining 31% preferred eating outside their home. Few (23.9%) of the respondents preferred to eat breakfast, most (47.9%) preferred to have lunch and some (28.2%) preferred dinner. Those who ate in response to anger were a minority (12.7%), 32.4% reported eating in response to boredom while about half the respondents (54.9%) ate in response to hunger. The minority of the elderly (2.8%) smoke, while the majority (97.2%) do not. A few (16.9%) of the respondents drank while the majority (83.1%) did not indulge in alcohol consumption. Only 16.9% eat once a day, 33.8% eat twice a day and others (49.3%) eat three times a day. A sparse percentage (18.3%) drinks less than 3 cups of fluid, only 28.2% drinks between 3-5 cups, and about half (53.5%) drinks over 5 cups.

Table 2: Dietary Habits of the Elderly.

Variables	Frequency (N=142)	Percentage
Eat at home or outside?		
At Home	98	69.0
Outside	44	31.0
Consumption of dairy products		
Never	40	28.2
once a day	36	25.4
2 times a day	10	7.0
3 times a day	4	2.8
4-6 times/ week	22	15.5
1-3 times/ week	30	21.1
Prefer to eat		
Breakfast	34	23.9
Lunch	68	47.9
Dinner	40	28.2
Eat in response to anger, boredom or hunger?		
Anger	18	12.7
Boredom	46	32.4
Hunger	78	54.9
Smoke?		
Yes	4	2.8
No	138	97.2
Drink?		
Yes	24	16.9
No	118	83.1
Meals eaten in a day		
1	24	16.9
2	48	33.8
3	70	49.3
Fluid consumed in a day		
less than 3 cups	26	18.3
3-5 cups	40	28.2
more than 5 cups	76	53.5

Using the Mini-Nutritional Assessment scale, it was found that 11.3% of the respondents were malnourished, 52.1% of the respondents were at risk of malnutrition and 36.6% of the respondents were normal.

Table 3: Mini-Nutritional Assessment of Elderly

Variables	Frequency (N=142)	Percent
Has food intake declined?		
severe decline	24	16.9
moderate decline	34	23.9
no decline	84	59.2
Mobility		
chair bound	6	4.2
little mobility	36	25.4
I can go out	100	70.4
Suffered psychological stress or acute disease		
Yes	42	29.6
No	100	70.4
Neuropsychological problems?		
severe dementia	2	1.4
mild dementia	36	25.4
no psychological problems	104	73.2
Involuntary weight loss?		
greater than 3kg	16	11.3
does not know	30	21.1
between 1 and 3 kg	48	33.8
no weight loss	48	33.8
Malnourished	16	11.3
At Risk of malnutrition	74	52.1
Normal	52	36.6

The results of the Geriatric Depression scale used to assess depression in the elderly as shown in Table 4 indicated that about half of the elderly (50.7%) were suggested to be depressed while others 49.3% were not depressed.

Table 4: Geriatric Depression Scale of Elderly

Variables	Frequency (N=142)	Percentage
Satisfied with your life?		
Yes	86	60.6
No	56	39.4
Dropped many of your interests and activities?		
Yes	46	32.4
No	96	67.6
Get Bored?		
Yes	38	26.8
No	104	73.2
Feel Helpless?		
Yes	30	21.1
No	112	78.9
Problems With Memory?		
Yes	38	26.8
No	104	73.2
Prefer to stay at home rather than go out?		
Yes	72	50.7
No	70	49.3
In good spirits?		
Yes	102	71.8
No	40	28.2
Most people are better than you are?		
Yes	44	31.0
No	98	69.0
Full of energy?		
Yes	74	52.1
No	68	47.9
Do you feel worthless?		
Yes	56	39.4
No	86	60.6
Is it wonderful to be alive?		
Yes	90	63.4
No	52	36.6

Yes	56	39.4
No	86	60.6
Feel happy most of the time?		
Yes	88	62.0
No	54	38.0
Afraid something bad is going to happen to you?		
Yes	28	19.7
No	114	80.3
Do you feel empty?		
Yes	38	26.8
No	104	73.2

A correlation analysis (Pearson's Chi-square test) was done between the nutritional status and emotional status of the respondents. No significant correlation (p=0.328) was found between the two variables and 8.5% of the elderly were found to be both malnourished and depressed and 23.9% were at risk of malnutrition and depression.

Table 5: Correlation between Geriatric Depression Scale score and Mini-Nutritional Assessment score

Variables	Normal	Suggest Depression	Total	P-value
Malnourished	4(2.8%)	12(8.5%)	16(11.3%)	
At Risk of malnutrition	40(28.2%)	34(23.9%)	74(52.1%)	0.328
Normal	26(18.3%)	26(18.3%)	52(36.6%)	
Total	70(49.3%)	72(50.7%)	142(100%)	

About half of the respondents (46.5%) never ate red meat, 18.3% eat it once a day, 9.9% eat it twice a day, no one eats it 3 times a day, 9.9% eats it 4 to 6 times a week and 15.5% eats it 1 to 3 times a week. The table also showed that a few (33.8%) eat chicken once a day, minority (4.2%) eat it thrice a day. When it came to tinned fish, some of the elderly (35.2%) never eat it and 8.5% eat it 2 times a day. About half (50.7%) do not take cheese while very few (2.8%) reported taking it three times a day. Also, the frequency of consumption of cereals and grains by the elderly showed that 39.4% of the elderly reported taking whole wheat bread once a day. Tomatoes were never eaten by some (29.6%) of the elderly. Sweet potatoes are eaten 4-6 times a week by 25.4% of the elderly while a minority (4.2%) eats it twice a day. Only 28.2% of the respondents eat Irish potatoes one to three times in a week.

Table 6: Dietary Pattern of the Elderly Studied

Variables	Never	Once / day	2 times/day	3times / day	4-6 times/week	1-3 times/week
Meat and meat products						
Red meat	46.4	18.3	9.9	0.0	9.9	15.5
Chicken	21.1	33.8	5.6	4.2	16.9	18.3
Tinned fish	35.2	15.1	8.5	11.3	14.1	15.5
Organ meat	35.2	33.8	1.4	1.4	11.3	16.9
Eggs	12.7	45.1	7.0	1.4	7.0	26.8
Milk and milk products						
Milk in cereal and yoghurt	39.4	32.4	5.6	2.8	11.3	8.5
Milk in beverage	42.3	28.2	7.0	1.4	16.9	4.2
Cheese	50.7	19.7	4.2	2..8	9.9	12.7
Cereals and Grains						
Whole wheat bread	31.0	39.4	5.6	4.2	4.2	15.5
Breakfast cereal	46.5	21.1	8.5	2.8	11.3	.9.9
Oats porridge	45.1	16.9	4.2	2.8	11.3	19.7
Legumes, Oil seeds and oils						
Legumes	21.1	16.9	23.9	1.4	14.1	22.5
Nuts	39.4	22.5	9.9	2.8	11.3	14.1
Soft margarine	28.2	2.8	8.5	4.2	16.9	39.4
Fruits						
Citrus	19.7	11.3	12.7	8.5	18.3	29.6
Orange/guava juice	21.1	11.3	18.3	4.2	18.3	26.8
Banana	18.3	14.1	7.0	12.7	21.1	26.8
Mangoes	15.5	19.7	5.6	9.9	19.7	29.6
Apple/pear	29.6	9.9	5.6	5.6	21.1	28.2
Avocado	33.8	21.1	2.8	7.0	12.7	22.5
Vegetables						
Broccoli	21.1	18.3	19.7	5.6	19.7	15.5
Spinach	31.0	23.9	11.3	11.3	18.3	4.2
Carrots	31.0	2.4	14.1	5.6	9.9	14.1
Tomato	29.6	4.2	21.1	1.4	26.8	16.9
Green peas	35.2	11.3	18.3	2.8	9.9	22.5
Green beans	23.9	19.7	8.5	1.4	12.7	33.8
Mixed Vegetables	36.6	19.7	7.0	1.4	5.6	29.6
Pumpkin	42.3	15.5	2.8	2.8	25.4	11.3
Sweet potato	18.3	22.5	4.2	7.0	25.4	22.5
Irish potato	14.1	19.7	22.5	1.4	14.1	28.2

Table 7 shows the health challenges faced by the elderly and the frequency of these challenges among the respondents. The majority (64.8%) of the respondents did not suffer from diabetes while the minority (35.2%) of the respondents did. Bone or joint problems were experienced by almost half (47.9%) of the elderly experienced while 52.1% did not experience it. Less than 20% (18.3%) reported being mild to moderately handicapped while 81.7% were not. Most of the respondents 59.2% did not have sleeping difficulties while almost half (40.8%) had challenges with sleeping.

Table 7: Health Challenges of the Elderly

Variables	Frequency	Percent
Diabetes		
Yes	50	35.2
No	92	64.8
Total	142	100.0
Hypertension		
Yes	50	35.2
No	92	64.8
Total	142	100.0
Stroke		
Yes	20	14.1
No	122	85.9
Total	142	100.0
Vision problems		
Yes	78	54.9
No	64	45.1
Total	142	100.0
Hearing problems		
Yes	48	33.8
No	94	66.2
Total	142	100.0
Cancer		
Yes	16	11.3
No	126	88.7
Total	142	100.0
Coronary disease		
Yes	30	21.1
No	112	78.9
Total	142	100.0
Bone/joint problems		
Yes	68	47.9
No	74	52.1
Total	142	100.0
Back/neck problems		
Yes	62	43.7
No	80	56.3
Total	142	100.0
Mild-moderate handicapped		
Yes	26	18.3
No	116	81.7
Total	142	100.0
Sleeping difficulty		
Yes	58	40.8
No	84	59.2
Total	142	100.0

Discussion

This study showed that a higher percentage of elderly were male, agreeing with the result of the last census held in 2006 by the National Population Commission which found that there were more elderly men than women. Although (24) stated that a higher proportion of elderly were female this was shown to reflect the age structure of Nigeria's population which has more women as compared to men.

The majority of the elderly in this study preferred to eat at home and this is confirmed in a report by (27) who stated that "homemade foods are preferred by the elderly". Lunch was found to be the most frequently eaten meal and this result is congruent with that of (28) in which it was found that the majority of the respondents had their principal meal in the afternoon. (29) discovered that not only do more elderly women live alone, but they also eat more meals per day than men who also live alone. A similar result was found in this study as more of the elderly women ate 3 meals a day than the men. Opposing the results of a study in Italy by (30) which found that most of the elderly in Italy drink alcohol, the majority of the elderly in this study did not indulge in alcohol.

This study showed the prevalence of malnutrition to be 11.3% and the prevalence of those at risk of malnutrition to be 52.1%, similar to a body of work by (31) which found that 11.6% of the elderly in a community in Kerala, India were malnourished and 46.5% were at risk of malnutrition The little differences in the prevalence in these studies may be attributed to the fact that these studies may have used different definitions of malnutrition and different settings such as communities, institutions and private households (32).

The results of this research revealed that many elderly feel happy with their status and this is also supported by previous research (33) that shows that the elderly feel right about themselves. It is also evident in this research results that the elderly are also grateful for being alive and they tend to express it with joyful activities (34). Despite the age of the elderly, they didn't drop most of their previous activities as they established full functioning abilities (35),, hence many of the elderly were not helpless as there were no symptoms of any incapacitation (36,37,38) that could make them give up on themselves.

Concerning GDS scores, about half of the elderly were suggested to be depressed which is higher than that of a South African study carried out by (39), in which it was recorded that the prevalence of depression was approximately 40%. When assessed, there was no significant association ($P \leq 0.5$) between the geriatric depression scale score which measured depression, and the mini-nutritional assessment score which measured nutritional status. Red meat consumption was not popular among the elderly in this study, contrary to the elderly in Switzerland, who consumed it regularly (40). Also, the percentage of the elderly in this study who take breakfast cereals once a day, is almost synonymous with the work of (41), which recorded that 28% of the elderly took breakfast cereals once a day. Vision problems were the most common challenge agreeing with the work of (42) which found that vision impairment was the most common handicap among the elderly in India.

Conclusion

A high prevalence of malnutrition, both under-nutrition and over-nutrition was found among the elderly, proving that the elderly are not spared from the double burden of malnutrition. There was also a high prevalence of depression among the elderly as more than half of the population were suggested to be depressed. No significant relationship was found between GDS scores and MNA scores, thus the relationship between nutritional status and depression is inconclusive as it is not well known whether depression causes malnutrition or poor nutritional status leads to depression.

Recommendation

More attention should be paid to the elderly nutritional and mental health by the Nigerian government policies in this regard should be developed and enforced. More community programs should involve the elderly, in a bid to help them socialize more and avert the feeling of loneliness which is a factor that causes depression. Furthermore, food and nutrition policies such as coupons for the elderly and subsidies on their foods, should be put in place and enforced to check mate malnutrition that may arise due to food insecurity. Finally, more studies should be carried out to ascertain for sure, the relationship between depression and malnutrition.

Ethics approval

Ethical clearance was obtained from the Babcock University Health Research Ethics Committee (BUHREC) number 239/22.

Informed Consent

An informed consent was also obtained from the respondents before the questionnaire was admitted to respondents.

Declaration of interest:

The authors hereby declare no conflict of interest in this work.

Availability of data and materials

Data and materials are available on request.

Author's Contributions

Ngozi E.O. conceived, designed, and supervised the research work, Adegboye Taiwo B. did the statistical analyses, Maitanmi B. T., supervised the administration of the questionnaire, Maitanmi J. O. and Ogunbiyi Babafemi T. did the literature review and the first draft of the manuscript, Oleah Michelle O. is the student who did the work and wrote the project, while Oyedeji

Olajumoke A and Akinsanya Olubunmi B. edited the manuscript

Funding

The research was self-sponsored by the authors

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