

Research paper

Body Ailments Dietary Pattern and Nutritional Status of Elderly in Ondo State, Nigeria.

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ABSTRACT

Objective: The study investigated the various body ailments common among elderly, dietary intake and nutritional status of Ondo state elderly in Nigeria.

Methods: A random sampling of 400 elderly people from Ondo state, Nigeria. By means of Open ended and structured questionnaire, Demographic and non demographic variables such as body ailment food habit, dietary pattern and food frequency, were collected. There was anthropometric measurement to assess nutritional status. Analysis of Data was SPSS (Statistical Package for Social Science) Version 17. Percentage, Mean (X), Standard Deviation (SD) ; Odds Ratio and Confidence Interval.

Results: The demographic characteristics revealed that the majority of the elderly aged 60-69 years, married and have no formal education. Most of them are from monogamy and polygamy family structure. The body ailment reported includes Body pain() hypertension diabetes and musculoskeletal problems such as rheumatism, cramps and arthritis. The dietary pattern revealed that elderly ate from major food groups such as roots and tubers, cereals, legumes (cowpea and nuts) and meat, fish and eggs group as well as dairy and milk products. Nutritional status as revealed by body mass index significantly relates with a few body ailments especially hypertension. Dietary implication of nutritional status reveals that obese is five times more likely to develop in hypertension and twelve times more likely to develop asthma.

Conclusion: Elderly common body ailments include malaria hypertension, diabetes body pains and musculoskeletal problems like arthritis, rheumatism and cramps. More than a third are malnourished, and half are in normal nutritional status. Dietary implication of nutritional status reveals that obese is five times more likely to develop hypertension and twelve times more likely to develop asthma.

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40 INTRODUCTION

41 Humans are living longer than ever before with several population life expectancies at
42 birth now exceeding 80 years. Since the early 1970s, life expectancies have increased
43 globally by about 1 year every 3 years. The elderly today is living almost 20 years longer
44 than their ancestors at the beginning of the twentieth century.

45 The increased longer life is with lifestyle changes, better nutrition, improved health care,
46 educational and socioeconomic improvements, as well as social support systems [^{1,2,3}].
47 As we live longer, nutritional needs may change, either with 'healthy' aging or because
48 of the advent of disease and body ailments.

49 Body ailments medications, depression, dementia, chronic illness, disability, loneliness
50 and diminished senses of smell and taste may decrease the pleasure of eating,
51 influence food choices, dietary pattern thus making elderly nutritionally vulnerable [¹].

52 Remarkably, the numbers of elderly people in developing countries and Africa now
53 approach and will exceed those in developed countries so that the problem of aging is
54 global. The rise in the number of older populations implies an increased demand for
55 social services, especially health services since the per capita consumption of health
56 services is many times higher among older persons than among the rest of the
57 population in Nigeria [⁴].

58 Issues concerning the elderly, therefore, must be addressed in the context of the health
59 and nutrition.

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61 However, the lack of reliable data on the elderly population is a serious limitation to
62 understanding problems of the elderly and interventions needed. In this regard, the
63 study focused on the common body ailments, nutrition and the dietary pattern of elderly.

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66 SUBJECT AND METHODS

67 Methodology

68 The descriptive survey research design which involved the study of the large population
69 by selecting a representative sample to discover relative incidence distribution and
70 interrelations of variables[⁵] to collect data for this study. It involves the collection,
71 organization and analysis and description of the variables as they exist in a natural
72 setting without interference. The result of the representative sample can be inferred or
73 generalized.

74 Area of the Study

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The study area was Ondo State Nigeria bound in the East by Edo State, in the North by Kogi State, in the West by Oyo and Ogun State and in the south by the Atlantic Ocean. Akure is the State Capital. Ondo State is of three zones, Ondo North, Ondo Central and Ondo South. (Source: Ondo State Local Government Commission, Akure, 2009). The National Population Census of 2006 shows that, there is a total of three million, four hundred and sixty thousand eighty hundred and seventy seven (3,460,877) people in the state, (Federal Republic of Nigeria Official Gazette 2009).

Agriculture (including fishing) constitutes the main occupation of the people of the state. It is the leading cocoa producing state in Nigeria. Other agricultural products include yam, cassava and palm produce [6]. The state consists of both literates and non literates.

The majority of the citizens live in urban centers. It is a multi-ethnic state with the majority being Yoruba.

Population of the Study

There are two hundred and one thousand and sixteen (201,016) elders (60 years and above) in Ondo State (National Population Commission, 2009).

Sample and Sampling Techniques

Yaro Yamane Formula [7] employed to draw the sample for the descriptive survey research. This formula reduces the standard error that would have occurred. That is every subject has an equal chance of sampling as this was at 0.05 level of significance. The sample drawn is adequate to represent the entire population based on this formula. Yaro Yamane formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where

n = sample size

N = the finite population (elderly in Ondo State) = 201,016

E = level of significance (or limit of tolerable error)

1 = Unity (a constant)

$$n = \frac{N}{1 + N(e)^2}$$

$$= \frac{201,016}{1 + 201,016(0.05)^2}$$

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$$\begin{aligned}
 &108 \quad \quad \quad 1 + 201,016 (0.05)^2 \\
 &109 \quad \quad = \quad 201,016 \\
 &110 \quad \quad \quad \frac{201,016}{1 + 201,016 (0.0025)} \\
 &111 \quad \quad = \quad 399.206 \quad \quad \text{Approximately } 400.
 \end{aligned}$$

112 Two Local Government Areas was randomly selected by balloting from the six Local
113 Government Areas in each of the three zones for the sample.

114 **Research Instrument**

115 Open ended, and structured questionnaire was for the descriptive survey research
116 aspect of the study. The questionnaire consisted of two sections: Section A consisted of
117 items that sought information on Demographic and socio-economic status of
118 respondents. Section B consisted of items that determined their meal pattern and food
119 frequency.

120 **Questionnaire Administration and Collection**

121 Four hundred questionnaires administered through personal contact by the researcher
122 and research assistants. Five research assistants aided in the data collection.

123 **Validation of Instrument**

124 Three experts in human nutrition validated the questionnaire They validated so that it will
125 be the right one for gathering data, measuring the variables; that the items covered the
126 content of the questions raised for the study and removed (or reframed) ambiguous
127 words that will confuse the respondents. There was a pilot study in a different location
128 to see whether there is a need to modify the questionnaires.

129 **Reliability of the Instrument.**

130 There was a test re-test method to determine the stability and consistency of the
131 instrument by pilot test. Cronbach's coefficient alpha was 0.80.

132

133 **Method of Data Collection**

134 Validated questionnaires (four hundred) were administered through personal contact to
135 the elders in the selected areas.

136 There was anthropometric data collection using locally produced height meter for height
137 and electronic scale for body weight. The classification of nutritional status followed
138 WHO Standard, 1995.

139 Blood pressure measurement of respondents was in triplicate and categorized in to
140 Normal ((120-139mmHg); Mild (140-160mmHg); Moderate (160-180mmHg), and severe
141 (≥ 180 mmHg).

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Method of Data Analysis.

(1) SPSS (Statistical Package for Social Science) Version 17. Percentage, Mean (X), and Standard Deviation (SD)

(2) Odds Ratio and Confidence Interval. An estimation dietary pattern scores with self-reported ailments by a logistic regression model. Dietary factor scores were categorized into quartiles. To determine the relationship between dietary pattern scores with prevalence of self-reported the odds ratio (OR) and 95% CI for each quartile compared with the lowest quartile of each dietary pattern.

The reported ailments are the dependent variables while the dietary patterns are the independent variables. The logistic regression model predicts the occurrence of the disease in the respondents, i.e. occurrence of the disease is the predictive outcome.

Ethical Procedure:

The conduct of the study was according to the guidelines laid down in the Declaration of Helsinki. The Department of Nutrition and Dietetics Ethical Review Committee of the Federal University of Agriculture Abeokuta Nigeria approved all procedures. Informed verbal consent was from all subject with witness and formally recorded.

RESULTS

The demographic characteristics of the sample elderly revealed that there were more male respondents than female, and many were of 60-69 years. Most of the elderly were married and had no formal education.

The common body ailments reported include hypertension (8%) eye problem (11%), Musculoskeletal (rheumatism, cramps, arthritis) (24%), Malaria (7%) diabetes (3%), asthma (2%).

Elderly report on Alimentary/Digestive problem (4%), body pains (28%), and respiratory problems (14%). There was Information on malnutrition such as Obesity /overweight (22%) causing other body ailments and few others (5%) reported ailments such as epilepsy, cancer and sickle cell anemia. (Table 1)

Table 1: Prevalence of Self Reported Ailments among the Elderly in Ondo State

Ailments	Total n= 230(%)	Male n = 120(%)	Female n = 110(%)	Prevalence ratio(male vs. female)
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Hypertension	19(8.3)	8(6.7)	11(10)	0.74
Eye problem	26(11.3)	17(14.2)	9(8.2)	1.61
Musculoskeletal (rheumatism, cramps, arthritis)	56(24.3)	26(21.7)	30(27.3)	0.74
Diabetes	6(2.6)	2(1.7)	4(3.6)	0.43
Asthma	5(2.2)	3(2.5)	2(1.8)	1.27
Alimentary/Digestive problem	9(3.9)	5(4.2)	4(3.6)	1.06
General body pains	65(28.3)	33(27.5)	32(29.1)	0.97
Respiratory problems (cough)	33(14.3)	20(16.7)	13(11.8)	1.31
Other ailments (epilepsy, cancer, sickle cell anemia, etc)	11(4.8)	6(5.0)	5(4.5)	1.02
Total	230	120	110	

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175 The prevalence of self reported hypertension is 26% less in male respondents than in
176 female respondents. The prevalence of eye problem is 61% higher for male respondents
177 than female respondents. The prevalence of musculoskeletal (rheumatism, cramps,
178 arthritis) is 26% less in male than in female respondents while diabetes is 57% less in
179 male respondents than in female. Respondents reporting asthma as health impairment is
180 27% higher in male than in female and alimentary/digestive problems is 6.6% higher for
181 male than female respondents (Table 2).

182 Additional health problem reported by elders is poor eyesight. Eyesight is good for about
183 three quarters of the elderly while a quarter has a problem although they were unable to
184 give the physiological details. Good eyesight is vital to life food selection and improves
185 functional ability at old age.

186 The prevalence of respondents reporting body pains is 3% less in male than in female
187 respondents.

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The other respiratory problems are 31% higher in male than in female, but other ailments are 2% higher in male than in female respondents. The dietary pattern revealed that elderly ate from major food groups such as roots tubers cereals legumes (cowpea and nuts), meat, fish and eggs group as well as dairy and milk products.

Nutritional status as revealed by body mass index significantly relates with few body ailments especially hypertension. An obese compared with a respondent of normal weight is 5.5(95% confidence interval 1.47 to 20.80) times more likely to develop hypertension and 12.8 times more likely to develop asthma (table 2).

Table 2 : Associations of self reported diseases¹ with nutritional status² according to the body mass index (BMI) of respondents.

Dependent Variable	Normal weight (18.5-24.99kg/m ²)	Underweight (≤18.50 kg/m ²)	Overweight (25.0 -29.99kg/m ²)	Obese (≥ 30.00 kg/m ²)
	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)
Hypertension	1.00	1.4(0.52-4.06)	0.5(0.091-2.207)	5.5(1.47-20.80)*
Eye problem	1.00	0.9(0.30-2.56)	1.8(0.68-4.94)	1.8(0.43-7.16)
Musculo-skeletal	1.00	1.9(0.91-3.94)	1.0(0.40-2.19)	0.7(0.17-2.53)
Diabetes	1.00	2.2E-08(0.0-.)	1.2(0.12-11.6)	2.8(0.28-28.46)
Asthma	1.00	4.73E-08(0.0.)	2.2(0.15-32.45)	12.8(1.02-162.05)*
Alimentary/ Digestive problem	1.00	2.2(0.45-10.51)	2.0(0.33-12.25)	1.39E-08(0.0-.)

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General body pains	1.00	0.6(0.31-1.35)	1.3(0.59-2.87)	0.1(0.01-0.84)*
Respiratory problems (cough)	1.00	1.1(0.16-8.00)	0.5(0.03-9.85)	1.5(0.81-2.82)
Other ailments	1.00	0.6(0.07-5.82)	4.7(1.03-21.44)*	3.0(0.28-32.84)

* Significant at 5% level of significance ¹ Ailment was described as 'yes' if the respondent had the ailment and 'no' if he did not.

² Nutritional status of respondents based on body mass index (BMI) categories.

The frequency of consumption of tubers Legumes and cereals relate significantly with hypertension ($P<0.05$)

The result of logistic regression model predicts, that (the second quartile), those who consume tubers on average is 11.8 times more likely to report hypertension: (95% CI 1.18 to 117.8), however, there are no significant outcome from consumers of fruits, vegetables and body ailments (Tables 3a & b).

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Table 3a: Logistic regression analysis showing the relationship between reported ailments and dietary patterns of elderly in Ondo State

Quartiles of dietary Scores	Hypertension	Eye problem	Malaria	Musculo-skeletal	Diabetes	Asthma	Body pains	Digestive	Respiratory
	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)
Animal protein									
-2.39§	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
-1.8	3.8E08 (.00,,)	7.71E07(.00,,)	3.9E08(.00,,)	4.6E08(.00,,)	8.8(.00,,)	16.7(.00,,)	4.14E0(.00,,)	1.4E09(.00,,)	1.8E08(.00,,)
-0.9	1.45E09 (.00,,)	67(.00,,)	15.0(.00, 0)	6.5E08(.00,,)	4.5E07(.00,,)	9.8E-08(.00,,)	1.2E09(.00,,)	6.3E18(.00,,)	.47(.00,,)
0.59	2.74E08 (.00,,)	1.73E08(.00,,)	1.9E08(.00,,)	6.1E08(.00,,)	1.2(.00,,)	4.2(.00,,)	6.5E08(.00,,)	5.7E10(.00,,)	1.4E08(.00,,)
P –value	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Tubers									
-1.42§	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
-0.87	11.82(1.18,117.8)*	.45(.04, 4.92)	5.5E07(.00,,)	.48(.09, 2.5)	6.3E07(.00,,)	4.6E07(.00,,)	1.7(.28, 10.5)	6.2E07(.00,,)	2.2E08(.00,,)
-0.05	1.47(.46,4.67)*	.81(.07, 9.53)	4.2E07(.00,,)	.89(.17, 4.8)	5.3E07(.00,,)	1.5E08(.00,,)	1.0(.15, 6.8)	2.3E07(.00,,)	1.3E08(.00,,)
1.31	1.03(.18,5.75)*	1.1(.09, 11.7)	2.1E07(.00,,)	.37(.07, 2.1)	.45(.00,,)	2.0E07(.00,,)	1.7(.26, 10.6)	4.8E07(.00,,)	3.4E08(.00,,)
P –value	<0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Legumes									
-1.15§	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
-0.4	.05(.01,.74)	2.9(.33, 25.6)	1.1E08(.00,,)	.88(.29, 2.6)	2.4E08(.00,,)	.26(.02, 3.7)	.58(.21, 1.5)	.20(.03, 1.6)	.64(.16, 2.6)
0.72	.37(.08, 1.64)*	2.6(.26, 27.4)	7.4E07(.00,,)	.82(.23, 2.9)	3.9(.00,,)	.30(.01, 7.0)	.38(.11, 1.3)	.35(.03, 3.7)	.94(.19, 4.9)

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2.6	.54(.09, 2.97)	4.6(.39, 54.9)	2.0E08(.00,.)	.74(.16, 3.5)	.8(.00,)	4.5E09 (.00,.)	.72(.18, 2.8)	4.4E- 09(.00,.)	.49(.07, 3.72)
P –value	< 0.05	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05	>0.05	>0.05	>0.05
Cereals									
-1.15§	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
-0.45	.52(.13, 2.19)*	1.1(.23, 6.2)	.11(.01, .94)	1.5(.47, 5.10)	.21(.01, 3.1)	6.4E07(.00,.)	.71(.26, 1.8)	2.5(.18, 33.9)	1.9(.39, 9.
0.6	.15(.02, .99)	2.3(.43, 12.7)	.26(.03, 2.2)	2.9(.86, 10.1)	.15(.01, 3.7)	1.2E08(.00,.)	.49(.16, 1.5)	3.5E- 08(.00,.)	1.5(.25, 8.
2.36	.23(.02, 2.65)	.35(.03, 4.8)	.87(.09, 8.04)	1.9(.38, 9.8)	3.4(.01, 119.3)	7.7E08(.00,.)	.64(.16, 2.6)	2.5(.07, 94.6)	1.6(.21, 12.5)
P –value	<0.05	> 0.05	< 0.05	> 0.05	> 0.05	> 0.05	>0.05	>0.05	>0.05

¹ Ailment was described as 'yes' if the respondent had the ailment and 'no' if he did not. * Significant at 5% level. § Reference variable.

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Table 3b: Logistic regression analysis showing the relationship between reported ailments¹ and dietary patterns of elderly in Ondo State

Quartiles	Hypertension	Eye problem	Malaria	Musculo-skeletal	Diabetes	Asthma
	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)	OR(95% CI)
Fruits						
-1.03§	1.0	1.0	1.0	1.0	1.0	1.0
-0.45	2.4(.47, 12.7)	1.7(.45,6.9)	.10(.01,1.2)	1.1(.47,2.8)	.31(.04,2.5)	5.4E+07(.00,.)
0.43	2.4(.36,16.7)	3.7(.85,16.1)	.24(.02,3.0)	.55(.18,1.7)	.29(.02,5.0)	1.5(.00,.)
1.88	5.2(.77,34.5)	1.9(.37,9.7)	.61(.06,6.4)	.86(.27,2.7)	.00(.00,.)	3.5E+07(.00,.)
P –value	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Dairy						
-0.75§	1.0	1.0	1.0	1.0	1.0	1.0
-0.87	1.6(.52,5.3)	1.8(.70,4.69)	.59(.05,6.3)	.86(.40,1.8)	.43(.03,5.5)	.73(.11,4.8)
-0.05	1.3(.31,5.9)	.53(.11,2.6)	3.8(.65,22.6)	1.2(.52,2.8)	1.5(.17,12.3)	2.44E-08(.00,.)
1.31	5.2(.79,34.1)	2.3(.38,13.3)	4.5(.26,77.9)	1.2(.26,5.2)	.00(00,.)	2.6E-08(.00,.)
P –value	>0.05	>0.05	>0.05	>0.05	>0.05	>0.05
Vegetables						
-1.15§	1.0	1.0	1.0	1.0	1.0	1.0
-0.03	.24(.05,1.14)	.59(.15,2.4)	1.3(.10,16.2)	2.5(.73,8.5)	.70(.05,10.3)	2.1E+07(.00,.)
1.05	.21(.03,1.3)	.31(.06,1.6)	2.2(.16,30.9)	1.5(.39,5.7)	1.96(.16,24.6)	1.1E+07(.00,.)
2.86	.33(.05,2.2)	.32(.05,2.1)	.79(.02,30.8)	1.4(.30,6.5)	.01(.00, .)	.45(.00, .)
P –value	>0.05	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05
Vitamins						
-1.15§	1.0	1.0	1.0	1.0	1.0	1.0
-0.45	.42(.11,1.7)	1.0(.36,3.1)	.39(.04,4.1)	.70(.30,1.6)	3.4(.39,30.3)	.78(.07,8.9)
0.6	.42(.08,2.3)	.33(.07,1.7)	.85(.07,10.9)	1.2(.48,3.0)	2.3(.15,35.1)	3.6E-08(.00,.)
2.36	.01(.00, .)	2.0(.36,11.3)	1.9(.12,31.2)	1.1(.25,5.1)	.02(.00, .)	.54(.00, .)
P –value	>0.05	> 0.05	> 0.05	> 0.05	> 0.05	> 0.05

¹ Ailment was described as 'yes' if the respondent had the ailment and 'no' if he did not

§ Reference variable.

Discussion

The relationship of body ailment with dietary pattern and nutrition is not limited to elderly in Nigeria.

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Research has shown that food variety has a prominent role to play in the prevention of onset of diseases such as diabetes, cancer and cardiovascular disease. A varied diet, ideally containing 20-30 biologically distinct foods a week, is beneficial in the prevention of certain disease states in the elderly [^{3,8}]. Specifically, there is an association between increased food variety and lower glycemic response in both insulin-dependent and non-insulin-dependent diabetes mellitus (IDDM and NIDDM). Greater dietary diversity has also been found to be predictive of less morbidity and greater longevity in people aged over 70 years [¹].

The significant interaction of diet to obesity, hypertension, asthma and diabetes in this study is in agreement with most findings in nutrition of the elderly [^{9,10,11}].

Overweight and obesity are common problems in the aged, not because they are an inevitable part of growing older, but because of the associated sedentary lifestyle. The obesity can aggravate chronic diseases such as diabetes mellitus and hypertension.

BP correlates strongly with BMI in International Study of Salt and Blood Pressure (ITERSALT) study [9]. Other workers also found a significant increase in prevalence of hypertension with increasing BMI. In a study conducted by Kumar *et. al*, [2002] prevalence of hypertension is high among the overweight patients.

Among the risk factor of hypertension is dietary intake. Dietary diversity is important to the adequacy of a certain nutrient in the elderly. The intake of tuber legumes and cereals relates significantly hypertension in this study. In Nigeria, the most available foods are tubers cereals and legume seeds especially cowpea. It is not surprising for the majority to consume cereals and tuber based diet. Although, this type of diet may not be adequate in micronutrient and that means elderly should still continue to take vitamin and mineral supplement.

Furthermore, the Nigeria food based dietary guideline recommends that elderly eat diets that are prepared from a variety of available foods e.g. cereals, tubers, fruits, vegetables, etc.; increase consumption of fish and fish-based diets; eat more of fruits and vegetables; eat more frequently.

In the current study elderly complain of alimentary canal/digestion problems. The problem of GIT and nutrition of elderly is well known In literature [^{12,13}].

Problem with the intestinal tract can encourage low food intake and consequently poor nutritional status. The intestine loses strength and elasticity with age; this slows motility and increases the risk of developing constipation (which is four to eight times more common in the elderly than in younger adults) [¹]. Also, these changes in the stomach can impair digestion and absorption of nutrients, especially vitamin B12, biotin, calcium and iron [^{12, 13}]. However, our study did not look in the details of nutrient impairment. Up till now, the research of elderly food intake, stomach reactions and problems of GIT are mostly extrapolated from animal studies, there is need for more work from human research point of view.

CONCLUSION AND RECOMMENDATION

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The elderly common body ailments include malaria hypertension, diabetes body pains and musculoskeletal problems like arthritis, rheumatism and cramps. More than a third are malnourished, and half are in normal nutritional status. Dietary implication of nutritional status reveals that obese is five times more likely to develop hypertension and twelve times more likely to develop asthma. It is recommended that more work should be done to identify optimal dietary pattern and food combinations that are most effective in preventing diseases in the elderly.

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