Research Article

A COMPARATIVE STUDY OF NUTRITIONAL STATUS AND ALLIED FACTORS OF ELDERLY PEOPLES OF OLD AGE HOMES AND OWN HOUSES

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ABSTRACT

The elderly population in India is continuously increasing and the problems parallel also. So, the numbers of elderly people in old age homes are gradually increasing, as most of the parents are now deciding to live in old age homes rather than with family due to maladjustment, lack of care, emotional and economic support from the family, lac of independence etc. Various studies have been undertaken in the past to get a comparative view of nutritional and depression status of the residents of old age home and community elderly in abroad and elsewhere in India. The present study was undertaken involving some old age homes and community areas of Hooghly and north 24 pargana districts. The result of the present study showed that people living in the old age homes are less affected with malnourishment and depression in compare to the people living in community. A possible explanation form this may be that in the old age homes, the inmates lead a social life with each other of same age groups, whereas in community most of the subjects were found either completely lonely or with spouse only who is equally aged. So, in the latter group lack of proper care is very much evident from their poor nutritional and mental status.

KEYWORDS: Old age home, MNA, GDS, MMSE, IADL Malnutrition, Depression.

INTRODUCTION

Globally, the elderly population is growing rapidly. In elderly people, the most pivotal problems are improper cognitive functioning, functional impairment and malnutrition.[1] Different studies have suggested that elderly people suffer from psychological, functional and health related diseases because of their unhealthy family conditions.[1] The increase in the elderly population is a global phenomenon reflecting the increase in life expectancy that has changed the demographic profile of several countries.[1]

Nutrition is a key component of health, and good nutrition is a vital factor behind good health. Many factors affect nutritional status in elderly people, the ageing process is associated with reduce appetite and energy expenditure coupled with a decline in biological and physiological functions.[2,3] In addition, psychological illness such as depression, dementia, and cognitive disabilities all play role in the complex etiology of malnutrition in the elderly. In older peoples such psychological illness depression is one of the most common and reversible causes of malnutrition. The relationship between nutrition and depression is complex. Depression has been associated with undernutrition, overnutrition, and deficits in specific food components and nutrients. The term depression can apply to a transient mood, a sustained changed in mood a symptom or a disorder.

Other factors such as financial concerns and relocation may also affect a person's eating patterns, either through limited food choices or loneliness and lack of social interactions that diminishes enjoyment in eating, which is turn affects food intake.[4] Malnutrition in elderly is a major concern because it can have adverse outcomes. It has been associated with a decline in functional status, impaired muscle function, decreased bone mass and high mortality rates. Obesity too can a problem affecting older people and the contributes to hypertension and diabetes and is associated with increased risk of cancer, coronary heart diseases and stroke.[6] Malnutrition is common among residents of old age homes and studies indicate that nutritional status can decline within a period of less than 3 months. Therefore, residents who are at risk of developing malnutrition go unrecognized because the anthropometric parameters of elderly are considered rarely.[5]

Many comparative studies associated with nutritional and depression level of residents of old age homes and those living in community were conducted in India and Abroad.

A study in Korea[6] showed that depression was more prevalent among the community dwellers than those residing in old age homes. On the other hand, in Turkey[7] the prevalence of depression 41% for those living in an institution and 29% for those living at community. Another comparative study in Iran[8] found that Elderly people living in nursing homes have lower BMI, suffer from many nutritional deficiencies and are predisposed to malnutrition, impaired cognition and deteriorating physical performance, compared to community dwelling seniors. In India, result of a study[9] showed that the elderly at home had higher BMI and higher MNA scores compared to those living in old age homes. The MNA results revealed that the percentage of malnourished subjects and those with risk of malnutrition in the old age home residents is far higher compared to the community living subjects. Another study[10] regarding the comparative prevalence of depression among the elderly living in old age homes and community in Visakhapatnam, India showed that prevalence of depression was high among inmates of old age homes compared to those of community. Similar result was obtained in another Indian study at Rajkot, Gujrat.[11] On the other hand, Individuals in old age homes had less prevalence of psychiatric illness than those living in the community in a study at Khammam district in Andhra Pradesh.[12] Thus, it is evident that although some studies have been undertaken to get a comparative view of nutritional and depression status of the residents of old age home and community elderly in abroad and elsewhere in India, very little work has been carried out in recent times regarding this in West Bengal particularly in Hooghly district. Therefore, the present study was undertaken to evaluate the nutritional status of elderly living at old age home and in community.

MATERIALS AND METHODS
Study subjects
The present cross sectional study was conducted among 130 elderly subjects ranging between 60 and 90 years of age over a period from March to May 2019.The study subjects were divided on the basis of their habitat, 50 subjects were from of two old age homes in Hooghly district, and 80 inhabitants were of localities of Sreerampur, Rishra, Bandel and Barrackpore areas of Hooghly and North 24 Parganas respectively. Subjects of both genders were included in the study. The purpose the study was explained to them in their mother tongue and written consent were taken from willing persons, unwilling persons and those with other illness were excluded from the study.

Methods
The subjects invited to answer the questions which deal with information such as age, educational status, monthly family income, past and present record of disease, medicine taken/ day etc. The questionnaire form, used for this study was the Mini Nutritional Assessment (MNA), the Geriatric Depression Scale-15 (GDS)[13,14] for assessment of nutritional status and depression level

respectively. Mini Mental State Examination (MMSE) questionnaire[15] was used to estimate the cognitive function. The MMSE is the most common screening tool for the evaluation of cognitive impairment/Alzheimer's disease dementia. It is particularly important to assess the performance of the MMSE in research protocols.[16] Instrumental Activity of Daily Living (IADL) scale is used to examine the dependency of the subjects while using some household instruments to carry out common essential activities.[17] Instrumental Activities of Daily Living, which is concerned with more complex activities needed for independent living. IADL refer to a series of life functions necessary for maintaining a person's immediate environment. This type of activities measure competence in functions that are less bodily oriented than physical self-maintenance. They include managing money, shopping, telephone use; travel in community, housekeeping, preparing meals, and taking medications correctly.[18,19]

The MNA questionnaire was used for the assessment of nutritional status.[20] It is an instrument specifically designed for elderly people. It comprised 18 items, which are based on the following components: anthropometric measurements, dietary questionnaire, global health and social assessment, and subjective assessment of health and nutrition.
1. **Anthropometric measurements** – Questions 1–4 include current body mass index (BMI), mid-arm circumference (MAC), calf circumference (CC), and weight loss in the last 3 months. BMI (kg/ m^2) = weight (kg) / height (m^2)
2. **Global assessment** – Questions 5–10 include living arrangements, number of prescribed medications, and psychological stress in the last 3 months, mobility, neuropsychological problems, and pressure sores.
3. **Dietary assessment** – Questions 11–16 include number of full meals per day, protein intake, fruit and vegetables intake (over 2bowl per day), and decrease in food intake in the last 3 months, fluid intake per day, and the ability to eat alone.
4. **Subjective assessment** – Questions 17 and 18 include subjective assessment of the participant's nutritional and health status.

Malnutrition indicator scores of <17 was considered malnourished, between 17 and 23.5 were considered at risk of malnutrition, between 24 and 30 were considered normal. Questionnaire was translated into Bengali, the vernacular and was retranslated into English.

Depression level
For screening of the elderly patients at risk of depression, Geriatric Depression Scale, the GDS questionnaire (GDS-30) was used. This tool has been validated in Iran.[14] The GDS-30 yielded a 84% sensitivity rate and a 95% specificity rate. Scores of 0–4 were considered normal; 5–8 indicated mild depression; 9–11 moderate depression and 12–15 severe depression.

Cognitive impairment by MMSE
The test is scored by assessor who questions the client. Each question is scored out 5 except for the recall questions, which is scored out 3. The recommendation for the modified scale is to add only the scores for recall and orientation for place to give a total out of 8. It is an 11 questionnaire measure, the maximum score is 30. A score of 23 or lower is indicative of cognitive impairment. In India, the prevalence of cognitive impairment in the elderly measured using the Hindi Mental State Examination (HMSE) or modified Mini-Mental State Examination (MMSE).

The IADL
There are 8 domains of functions measured with the Lawton IADL scale. These domains are food preparation, housekeeping, laundering etc. Persons are scored according to their highest level of functioning in that category. A summary score ranges from 0 (low functioning, dependent) to 8 (high functioning, independent). Instrumental activities of daily living (IADL) measures an individual's ability to carry out tasks that may not need to be done daily, but which nevertheless are important for living independently. Performance of IADLs requires mental as well as physical capacity.

Statistical analysis
Statistical Software used: Minitab® Statistical Software (v 14.0).

RESULTS
In the present study, subjects (total n= 130) of both from old age home (OAH) (n=50) and from general community (n=80) were included. Table 1 shows the comparative account of the subjects on the basis of their residence with respect to their anthropometric and socioeconomic parameters and score of MNA and GDS. It is evident from table 1 that there were no significant differences between the residence of the subjects (old age home &community) with mean values of anthropometric and socioeconomic parameters and MNA and GDS scores.

Table 1: Table showing a comparative account of old age home and community subjects with respect to anthropometric and socioeconomic parameters.

Mean	Old age home	Community	
Age (yrs.)	72.46	69.45	
Height (mt)	1.58	1.57	
Weight (kg)	64.16	56.83	
MAC (cm)	29.49	27.40	
CC (cm)	34.95	31.83	Not Significant
Yrs. of education	14.38	10.93	
Monthly Income (Rs.)	13989.583	11023.75	
BMI	25.8	23.6	
MNA score	22.73	19.11	
GDS score	13.9	15.8	

Table 2 shows the association between place of living (old age home and community) of the subjects and their BMI status, nutritional status (on the basis of MNA score) and depression status (on the basis of GDS score). Chi square test (χ^2) result showed that the residence of the subjects associated significantly with above all the factors like depression level (based on GDS score), nutritional status (based on the MNA status) and also the BMI status. Two proportion tests were carried out following the χ^2 test. Result of two proportion test revealed that the number of underweight subjects is significantly higher in the community subjects. This is also reflected in the number of malnourished subjects, according to MNA score which is higher in the community than in the OAH, on the other hand the properly nourished subjects were found to be significantly higher in the OAH. The proportion of subjects without and mild depression is found to be significantly higher in the OAH than the community.

Table 2: Pearson's Chi Square table for determination of association between place of residence of the subjects and the BMI status, MNA status and GDS status.

Parameters	OAH (n)	Community (n)	χ^2 (p value)	p values for two proportional tests
BMI Status			9.866*	
Underweight	0	10		0.001*
Normal weight	22	41		0.419
Overweight	21	24		0.166
Obese	7	5		0.167
MNA Status			17.567**	
Malnourished	2	28		0.000**

At risk of Malnourishment	28	35		0.171
Normal nutrition	20	17	6.870*	0.024*
GDS Status				
No depression	17	12		0.015*
Mild depression	21	48		0.042*
Severe depression	12	20		0.897

* <0.05, ** <0.001

Pearson's correlation coefficients were determined between MNA score and Anthropometric, Socioeconomic and other factors of the subjects of both OAH and community (Table 3 and 4). Weight, Medicines taken per day and GDS level were found to be correlated significantly with the MNA scores of the subjects of old age homes the MMSE and the IADL scores are not significantly correlated with the MNA scores of the old age home subjects.

Table 3: Table showing Pearson's Correlation of MNA score with anthropometric, socioeconomic and some psychomotor parameters of the subjects residing in old age home.

		Height	Weight	MAC	CC	Education	Monthly Income	Medicines taken / Day	GDS level	MMSE Score	IADL score
MNA score	Pearson correlation	0.235	0.314	0.124	0.178	0.125	0.214	-0.54	-0.387	0.168	0.269
	P value	0.10	0.02*	0.40	0.21	0.40	0.14	0.000**	0.006*	0.244	0.059

**<0.001, *<0.05

Pearson's correlation coefficients were determined between MNA score and anthropometric, socioeconomic and other factors of the subjects of community. Height, Weight, BMI, MAC, CC, Educational level, monthly income, GDS score, MMSE and IADL score were found to be correlated significantly with the MNA score of the subject of communities.

Table 4: Pearson's Correlation of MNA score with anthropometric, socioeconomic and some psychomotor parameters of the community subjects.

		Height	Weight	MAC	CC	Education	Monthly Income	Medicines taken / Day	GDS level	MMSE Score	IADL score
MNA score	Pearson correlation	0.44	0.502	0.279	0.49	0.304	0.279	-0.074	-0.518	0.471	0.455
	P value	0.000**	0.000**	0.012*	0.000**	0.006*	0.012*	0.512	0.000**	0.000**	0.000**

** <0.001, * <0.05

Multivariate step wise regression analysis was used to examine the association between MNA score and other factors using MNA score as the dependent variable of subjects of both OAH and community. Stepwise linear regression analysis identified weight, medicines taken per day and GDS score of the subjects of OAH as the significant predictors for MNA score (dependent variable) among all the correlated factors. The Regression equation is given below.
MNA SCORE = 21.79 + 0.0734 weight (kg) - 0.389 Med taken/day - 0.1537 GDS LEVEL

Stepwise linear regression analysis identified height, calf circumference, GDS score and MMSE score of the subjects of community as the significant predictors for MNA score (dependent variable) among all the correlated factors. The Regression equation is given below.
MNA = -8.50 + 8.71 h in m + 0.428 cc - 0.2622 GDS + 0.1119 MMSE + 0.434 IADL

DISCUSSION
Earlier many studies concluded that elderly people residing in the old age home are relatively affected with depression and malnourishment than their counterpart living within the community. This is in contrast to the findings of the present study where we found that subjects living in the old age home are less affected with malnourishment and depression in comparison to the subjects living within community.

The number of subject belonging to old age home and community are 108 and 102 respectively in a study at Mangalore[9] whereas in the present study, these numbers are much lower 50 and 80 respectively, Similar to another study in Belzium[21] where these numbers are 70 and 70 respectively.

In an Indian study[9] the elderly at community had significantly higher mean BMI and mean MNA scores compared to those living in old age homes. Whereas in a study at Iran[8] the residents of nursing home have

significantly lower BMI level than those living at community. But in the present study the mean BMI, MNA, GDS scores do not differ significantly between the subjects residing in Old Age Home and in community.

The proportion of malnourished and at-risk subjects in old age home and community are 19.4%, 57.4%, 2% and 14.7% respectively according to a study at Mangalore[9] whereas in the present study 4%, 56%, 35% and 44% of the subjects in old age home and community are found to be malnourished and at risk respectively.

In a study in Ankara, Turkey[22] it was found that Malnutrition rates were higher in individuals living alone compared to those who live with their family. In present study we found that risk of malnutrition and malnutrition are comparatively higher in community than old age home. In earlier studies the nutritional status according to MNA score is found to be correlated with various factors such as MUAC and CC,[9] BMI, MUAC and CC.[5] In the present study the nutritional status is found to be significantly correlated with the height, weight, BMI, MUAC, CC, education level and monthly income of the community subjects and only with weight and medicines taken per day by the old age home Subjects.

In Coimbatore[23] no significant association was found between nutritional status and medicines taken which affects the health status of the subjects while in the present study this factor is found to be correlated with nutritional status of the subjects residing at old age home but not with that of community.

In Korea[6] the higher numbers of community elderly are affected with depression in comparison to the nursing home elderly subjects. In the present study although the mean GDS scores do not significantly differ between the residents of old age home and community, the level of depression is found to be associated significantly with the place of residents of the subjects.

The MNA and MMSE scores of the residents of old age home and community in Iran[8] were found to be significantly different between the groups. In the present study the MMSE and IADL score were found to be correlate significantly with the MNA score of the community subjects but not with that of the old age home subjects.

CONCLUSION
A possible explanation for the result of the present study may be due to the fact that elderly persons living in the old age home are well cared by the home authority, in terms of supply of healthy and nutrient rich foods, also the inhabitants are well communicated with each other, they are also involved in yearly tour organized by the old age home authority. The inhabitants also spent time by various indoor sports activities. All these factors contribute to their overall well being. On the other hand,

we found most of the elderly subjects lonely residing in the community. They are either only with their spouse or they stay in their house completely lonely. Most of their offspring's stay elsewhere with their families. As a result, there is a lack of care giver that result in the malnutrition or the risk of it, mild or severe depression and decreased cognitive capabilities in comparison to their old age home counterpart.

Limitations
First of all, the comparative study was conducted among 80 community and 50 old age home subjects which are a relatively small sized population at in a suburban area of Hooghly and north 24 pargana district. Therefore, the findings of the study may not even be generalized for both the inmates of old age home and community area located in Hooghly and 24 pargana proper. Secondly, qualitative research methods were not adopted that might lead to more detailed assessment of the factors contributing to nutritional status of the study population.

ACKNOWLEDHEMENT

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