



Functional and Nutritional Status of Indian Institutionalised Elderly

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ABSTRACT

Elderly become more vulnerable to malnutrition and ill health as they grow older. This study was done to assess the functional and nutritional status of institutionalized elderly. The study was conducted in 100 (65 females) elderly aged 78.6 ± 6.9 years. Males had higher height, weight, fluid intake and better functional status ($p < 0.05$). Females had higher fasting blood sugar, HDL cholesterol and proteins ($p < 0.05$). In Mini Nutritional assessment (MNA), females were found more malnourished ($p < 0.05$). Institutionalized Males have better functional and nutritional status as compared to females.

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Introduction

Ageing is an inevitable and universal phenomenon of life. It refers to a multidimensional process of physical, psychological and social changes [1]. Old age constitutes one of the major challenges confronted by the societies in the present century. The proportion of older persons in India's population has risen from 5.63 per cent in 1961 and is expected to be 12.4% in 2026. India ranks 4th in terms of absolute size of elderly population. Elderly population in India accounts for 8% of total population in 2010 [2]. In this changing economic and social milieu, the younger generation is searching for new identities encompassing economic independence and redefined social roles within, as well as outside, the family. The changing economic structure has reduced the dependence of rural families on land which has provided strength to bonds between generations. The traditional sense of duty and obligation of the younger generation towards their older generation is being eroded [3]. Along with the positive trend of increasing global health, however, special health challenges for the 21st century are preparing health providers and societies to meet the needs of elderly people, training for health professionals on old-age care, preventing and managing age associated chronic diseases, designing sustainable policies on long term care and developing age-friendly services and settings [4].

Nutrition is an important element of health in the older population and affects the aging process. The prevalence of malnutrition is increasing in this population and is associated with a decline in: functional status, impaired muscle function and mortality. Older people often have reduced appetite and energy expenditure, which, coupled with a decline in biological and physiological functions. In addition pathologic changes of aging such as chronic diseases and psychological illness all play a role in the complex etiology of malnutrition in older people [5]. Elderly become more vulnerable to malnutrition and ill health due to economic dependency, social deprivation and change in the behavior towards diet and health care [6]. The prevalence of overweight and obesity is increasing, particularly

in the elderly, where it is associated with increased mortality and a number of metabolic and cardiac disorders.

Overweight and obesity also contributes to functional decline and disability in the elderly [7]. Functional status is the cornerstone of geriatric care and serves as an indicator of general well-being. As such, functional status has been recognized as a relevant and important treatment outcome in the elderly population [8].

Changes in the occupational structure not always and decline in the family size where adult children do live with their parents have led to many emotional security problems of the older persons. Although old age homes at the moment cater to a small fraction of older persons but the way institutional support is coming up and the manner in which their number is increasing is an indication of recognition of need for institutional support. Old Age Homes (OAH) provides residential care for elderly who are in search for alternative home for security, companionship, care or who are unable to function independently. Geriatric services are largely unorganized. There are 1018 old age homes all over India [9]. In general, the elderly are at increased risk of malnutrition due to insufficient food intake (amount) and poor selection of food (quality). This situation is aggravated when institutionalized, the occurrence of nutritional disorders in institutionalized elderly ranging from 30% to 80%, with a consequent negative impact on their health [10].

Materials and Methods

A cross sectional study was conducted in Mumbai, India involving 100 institutionalized elderly above 60 years of age including both men and women and purposive sampling method was used for sample selection. Critically ill, bed ridden and mentally retarded residents were excluded. Interview schedule including personal background information, anthropometric data (height and weight), medical history (diabetes mellitus, cardiovascular diseases, hypertension and stroke), three days dietary recalls (one weekend and two weekdays) were collected. Diet recall was taken by using standard volumetric measures. BMI were calculated. Statistical Analyses were performed using SPSS software for Windows (version 16.0, 2007, SPSS Inc,

Table 1. Anthropometry, Biochemical Parameters & Dietary intake of Males & Females

| Parameters | Males | Females | P Value |
|-----------------------------|------------|------------|---------|
| Age (years) | 77.7±7.0 | 79.1±6.9 | 0.35 |
| Height (cm) | 164.3±7.2 | 156.8±4.7 | 0.00* |
| Weight (kg) | 67.0±12.7 | 60.8±9.9 | 0.02* |
| BMI (kg/m ²) | 24.7±4.2 | 24.7±3.8 | 0.98 |
| Haemoglobin (g/dl) | 12.6±1.2 | 12.4±1.2 | 0.37 |
| Fasting blood sugar (mg/dl) | 86.9±20.7 | 95.9±22.4 | 0.05* |
| HbA1C | 5.7±0.6 | 5.7±0.6 | 0.63 |
| Triglyceride (mg/dl) | 135.2±54.7 | 162.6±47.2 | 0.68 |
| Total cholesterol (mg/dl) | 162.6±47.2 | 168.5±49 | 0.56 |
| HDL Cholesterol (mg/dl) | 50.5±13.8 | 57.2±17.5 | 0.04* |
| LDL Cholesterol (mg/dl) | 93.3±37.3 | 93.2±40.7 | 0.99 |
| Energy (kcal) | 1441±197 | 1484±116 | 0.17 |
| Protein (g) | 45.6±6.6 | 46.5±3.8 | 0.04* |
| Carbohydrates (g) | 176.3±27.7 | 187.8±20.6 | 0.54 |
| Fat (g) | 64.1±8.9 | 63.2±6.3 | 0.39 |
| Fluid (Litres) | 3.5±1.7 | 2.0±0.9 | 0.00* |

Table 2. Activities of Daily living in males & females

| Characteristics | Males | | | Females | | | χ^2 | P value |
|-----------------|-------------|---------------------|-------------|-------------|---------------------|-------------|----------|---------|
| | Incontinent | Occasional Accident | Continent | Incontinent | Occasional Accident | Continent | | |
| Bowels | 0 (0) | 2 (5.7) | 33 (94.3) | 0 (0) | 10 (15.4) | 55 (84.6) | 2.02 | 0.15 |
| Bladder | 3 (8.6) | 0 (0) | 32 (91.4) | 0 (0) | 5 (7.7) | 60 (92.3) | 8.27 | 0.01* |
| | Dependent | Need some Help | Independent | Dependent | Need some Help | Independent | | |
| Grooming | 3 (8.6) | 32 (91.4) | 0 (0) | 6 (9.2) | 1 (1.5) | 58 (89.2) | 0.65 | 0.76 |
| Toilet Use | 0 (0) | 2 (5.7) | 33 (94.3) | 4 (6.2) | 17 (26.2) | 44 (67.7) | 9.25 | 0.01* |
| Feeding | 0 (0) | 2 (5.7) | 33 (94.3) | 1 (1.5) | 11 (16.9) | 53 (81.5) | 3.1 | 0.21 |
| Transfer | 3 (8.6) | 9 (25.7) | 23 (65.7) | 4 (6.2) | 21 (32.3) | 40 (61.5) | 0.58 | 0.75 |
| Mobility | 0 (0) | 7 (20) | 28 (80) | 1 (1.5) | 17 (26.2) | 47 (72.3) | 1.08 | 0.58 |
| Dressing | 0 (0) | 3 (8.6) | 32 (91.4) | 0 (0) | 20 (30.8) | 45 (69.2) | 6.33 | 0.01* |
| Stairs | 9 (25.7) | 9 (25.7) | 17 (48.6) | 17 (26.2) | 17 (26.2) | 31 (47.7) | 0.01 | 1.00 |
| Bathing | 2 (5.7) | 0 (0) | 33 (94.3) | 1 (1.5%) | 1 (1.5) | 63 (96.9) | 1.88 | 0.39 |

Table 3. Instrumental Activities of daily living in males & Females

| Characteristics | Males | Females | χ^2 | P value |
|--|-----------|-----------|----------|---------|
| Use of Telephone | | | | |
| Operates independently | 11 (31.4) | 13 (20) | 11.337 | 0.01 |
| Dials a few well-known numbers | 21 (60) | 27 (41.5) | | |
| Answers the phone but does not dial | 3 (8.6) | 12 (18.5) | | |
| Does not use telephone at all | 0 (0) | 13 (20) | | |
| Shopping | | | | |
| Takes care of all shopping independently | 19 (54.3) | 16 (24.6) | 9.534 | 0.02 |
| Shops independently for small purchases | 7 (20) | 20 (30.8) | | |
| Needs to be accompanied | 5 (14.3) | 11 (16.9) | | |
| Completely unable to shop | 4 (11.4) | 18 (27.7) | | |
| Food Preparation | | | | |
| Independently Prepares Meals | 15 (42.9) | 19 (29.2) | 3.431 | 0.49 |
| Prepares if ingredients supplied | 6 (17.1) | 20 (30.8) | | |
| Prepares meals, does not maintain diet | 3 (8.6) | 5 (7.7) | | |
| Completely dependent | 11 (31.4) | 21 (32.3) | | |
| Housekeeping | | | | |
| Maintains house alone | 6 (17.1) | 4 (6.2) | 12.303 | 0.02 |
| Performs light daily tasks | 20 (57.1) | 23 (35.4) | | |
| Performs light tasks, cannot maintain acceptable level of cleanliness | 4 (11.4) | 10 (15.4) | | |
| Needs help with all home maintenance tasks | 4 (11.4) | 13 (20) | | |
| Does not participate | 1 (2.9) | 15 (23.1) | | |
| Laundry | | | | |
| Does personal laundry completely | 2 (5.7) | 2 (3.1) | 8.123 | 0.017 |
| Launders small items | 25 (71.4) | 29 (44.6) | | |
| All laundry must be done by others | 8 (22.9) | 34 (52.3) | | |
| Mode of Transportation | | | | |
| Travels independently | 9 (25.7) | 8 (12.3) | 10.227 | 0.02 |
| Arranges own travel via taxi, does not use any other public transportation | 16 (45.7) | 17 (26.2) | | |
| Travels on public transportation when accompanied by another | 3 (8.6) | 16 (24.6) | | |
| Travel limited to taxi or automobile with assistance of another | 7 (20) | 24 (36.9) | | |
| Ability to handle finances | | | | |
| Manages financial matters independently | 12 (34.3) | 15 (23.1) | 8.352 | 0.02 |
| Manages day-to-day purchases | 23 (65.7) | 37 (56.9) | | |
| Incapable of handling finance | 0(0) | 13 (20) | | |
| Responsibility of Medicine | | | | |
| Independently takes medicine | 24 (68.6) | 22 (33.8) | 12.275 | 0.00 |
| Takes medicine if dosage prepared in advance | 11 (31.4) | 37 (56.9) | | |
| Not Capable of dispensing on medicine | 0 (0) | 6 (9.2) | | |

Chicago, IL). Data are presented as Mean \pm SD and frequencies (percentages). P-value < 0.05 was considered to be statistically significant.

Results and Discussion

A study was conducted in 100 elderly (65 females) aged 78.6 \pm 6.9 years to study the nutritional & functional status of elderly in residing old age homes. One of the study reported that Along with the rising number of older adults, the prevalence of obesity measured by body mass index continues to rise [11]. The mean height of the study group was 159.4 \pm 6.7 cm, weight was 63 \pm 11.3 kg and BMI was 24.7 \pm 3.9. The mean hemoglobin was 12.5 \pm 1.2 g/dl, fasting blood sugar was 93 \pm 22 mg/dl, HbA1C was 5.7 \pm 0.6, triglyceride was 131.9 \pm 59.6 mg/dl, total cholesterol was 166.4 \pm 48.2 mg/dl, HDL cholesterol was 54.8 \pm 16.6 mg/dl and LDL cholesterol was 93.2 \pm 39.4 mg/dl. The mean energy intake was 1469 \pm 150 kcal, protein intake was 46.2 \pm 4.9 g, carbohydrate was 183.8 \pm 23.8 g, fat was 63.5 \pm 7.3 g and fluid intake was 2.5 \pm 1.4 liters. It is also that reported rapid growth of elderly population has led to an increase in the ailments associated with ageing such as visual and hearing problems, stroke, heart disease, asthma and psychosocial problems such as isolation and economic problems etc.

Table 1 represents the anthropometry, biochemical and dietary intake of elderly when classified according to gender. Height, weight and fluid intake was significantly higher in males than in females (p<0.05 (Table 1). On the other hand, fasting blood sugar, HDL cholesterol and protein intake was significantly higher in females than in males (p<0.05) (Table 1). There was no significant difference in other biochemical and dietary parameters in between males & females (p>0.05) (Table 1).

In one study of Oliveira 2009, IADL and ADL showed that malnourished elderly were more impaired regarding the activities of daily living, which emphasizes the importance of nutrition. Malnutrition prevalence among the elderly admitted to the hospital was high, probably because of their vulnerability before the disease. Nutritional status deterioration is accompanied by reduced functional capacity. Thus, it is necessary to pay special attention to functional capacity when planning nutritional care for this group, especially when they are debilitated by disease [13].

Functional status of elderly was assessed using activity of daily living score. Activities of daily living were assessed in the elderly. Off the 100 elderly, 88 had continent bowel movement, 92 had continent bladder, 90 groomed independently, 77 used toilets and dressed independently, 86 ate food independently, 63 transferred or sat independently, 75 were mobile, 48 used stairs independently and 96 took bath independently. Table 2 presents activities of daily living when classified according to gender. As seen in Table 2, there was a significant association of gender with bladder movements, toilet use and dressing with gender (p<0.05) Higher percentage of males had incontinent bladder movements than females (Table 2). On the other hand, higher percentage of women had occasional accidents of incontinent bladder, needed help for using toilets and dressing (Table 2). There was no association of other activities of daily living with gender (Table 2) (P>0.05).

Instrumental activities of daily living were also assessed in the elderly. Off the 100 elderly, 24 operated telephone by oneself, 35 took care of all shopping independently, 34 plan, prepared and served adequate meals independently, 10 maintained all housekeeping tasks alone, 4 did all personal laundry, 17 travelled or used taxi independently, 27 managed financial matters independently and 46 took medicine

independently. Table 3 represents instrumental activities of daily living when classified according to gender. There was a significant association of gender with use of telephone, shopping, housekeeping, laundry, mode of transportation, taking medicine and financial matters (p<0.05) (Table 3). For all instrumental activities of daily living, higher percentage of females needed help as compared of males (Table 3). There was no significant association of food preparation and gender (p>0.05) (Table 3).

Date presented as frequency (percentage). *p<0.05 is statistically significant.

Nutritional assessment is important to identify and treat patients at risk, the Malnutrition Universal Screening Tool being commonly used in clinical practice. In addition pathologic changes of aging such as chronic diseases and psychological illness all play a role in the complex etiology of malnutrition in older people. The Mini Nutritional Assessment (MNA) form was used to assess the nutritional status of elderly (Guigoz Y. Mini Nutritional Assessment). Off the 100 elderly, 17 had moderate decrease in food intake, 61 had no weight loss, 48 used to go out or were mobile, 17 had psychological stress, 78 did had some level of dementia (neuropsychological problem) and 52 had BMI less than 23 kg/m². There was a significant association of food intake ($\chi^2 = 4.861$) and mobility ($\chi^2=9.158$) with gender (Fig. 1a and 1c) with higher percentage of males with no decrease in food intake and ability to go out as compared to females (p>0.05). There was a significant association of weight loss and gender with a higher percentage of females who had lost between 1-3 kg weight as compared to males ($\chi^2=8.824$, p<0.05) (Fig. 1b). There was no significant difference in percentage of males (80%) and females (84.6%) suffering from psychological stress ($\chi^2=0.343$, p>0.05). There no significant association of gender [males (mild=65.7%, severe 14.2%); females (mild=67.7%, severe=9.2%)] and dementia (neuropsychological problem) ($\chi^2=0.640$, p>0.05). There was no association of gender [males (<19 kg/m²= 8.6%, 19-21 kg/m² = 11.4%, 21-23kg/m² = 28.6%); females (<19 kg/m²= 4.6%, 19-21kg/m² = 21.5%, 21-23 kg/m²=2 7.7%)] and BMI ($\chi^2=2.023$, p>0.05).



Figure 1a. Screening for nutritional status using mini nutritional assessment – Food Intake

Date presented as percentage. p<0.05 is statistically significant in comparison to males.

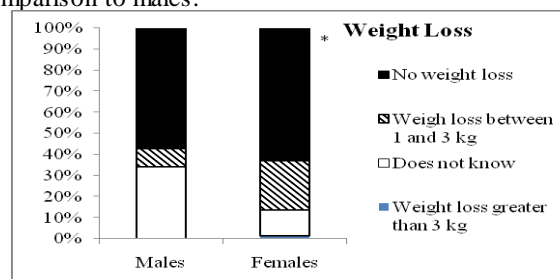


Figure 1b. Screening for nutritional status using mini nutritional assessment – Weight Loss

Date presented as percentage. $p < 0.05$ is statistically significant in comparison to males.

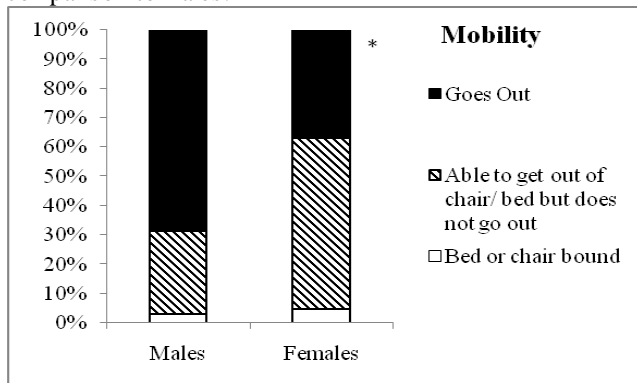


Figure 1c. Screening for nutritional status using mini nutritional assessment – Mobility

Date presented as percentage. $p < 0.05$ is statistically significant in comparison to males.

When the total mini-nutritional assessment score was calculated, 14 elderly had MNA score between 0-7 points, 45 elderly had MNA score between 8-11 points and 41 elderly had MNA score between 12 – 14 points. There was no significant association between gender [males (0-7 points = 8.6%, 8 – 11 points = 48.6%, 12-14 points = 42.9%); females (0-7 points = 16.9%, 8-11 points = 43.1%, 12 – 14 points = 40%)] and total MNA score ($\chi^2=1.331$, $p > 0.05$).

Conclusion

Institutionalised elderly males have better functional and nutritional status as compared to elderly females. Higher percentages of elderly females are dependent on others or need help for various functional activities as compared to elderly males.

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