Age related changes in nutritional status of the aged Sonowal Kacharis of Lakhimpur district, Assam

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Abstract:

A cross-sectional study was conducted to determine nutritional status based on BMI and tried to examine if there is any variation in nutritional status with regard to age, sex, economic conditions, morbidity and self- rated health status among the aged Sonowal Kacharis of Lakhimpur district, Assam. The sample consists of 265 aged (50 years and above), where 129 are males and 136 are females. The study reveals that prevalence of under nutrition is high in both sexes. Attempt is made to examine the probable causes of higher level of under nutrition.

Key words: Aged, nutrition, sex, income, age variation, self-rated health status.

Introduction:

Nutritional status of a population is an important factor to determine the health status of any population (Chakma et al., 2009). The health condition of the tribal population is still very poor in India and is at a higher risk of undernutrition because of their reliance on ancient agricultural practices, cultural norms and beliefs and irregularity of sufficient food supply. Health is primary a concern for human development and is an indispensable element for the wellbeing of mankind. Nutrition is directly associated with many morbid conditions and mortality (Kapoor et al., 2009). Nutritional status of a population is mostly dependent on environment both natural and cultural. An active healthy ageing life depends on proper nutrition along with other factors like physical activities (Krishnaswamy & Shanthi, 2010). Nutritional condition determines the physical wellbeing and normal health of a person. Malnutrition is associated with increased morbidity, age related decline and quality of life. The problems of malnutrion affect particular group instead of the whole population. The elderly are quite susceptible to malnutrition owing to reason like improper intake of food, low economic condition and sometimes also due to social deprivation (Sarmah, 2006).

Nutritional status of a person is generally a state of the body in relation to the consumption and utilization of nutrients. Proper nourishment in terms of quantity and quality is essential for normal life. Various parameters are used to assess the nutritional status but anthropometry is considered as one of the most reliable and practical tools for the assessment of nutritional status. BMI is extensively applied as suitable indicator of nutritional status in adults (Kapoor et al., 2010). Assessment of nutritional status help to develop health care programs that meet the community needs and it also helps to measure the effectiveness of the nutritional programs and intervention once initiated.

In India, very few studies have been done to assess the nutritional status in geriatric population, when compared to children and adolescent. But gradually, the influence of nutrition on ageing has been realized and as a result studies on ageing have gained importance (Sarmah, 2006). It is evident that more than seventy percent of our population resides in rural areas, and the number of aged people is found to be higher in rural areas as compared to the urban areas. But there is lack of published data dealing with age variation in nutritional status of the rural aged. To provide health security to this vulnerable section of population there is urgent need to evaluate their health status. Therefore, an attempt is made to find out the age variation in nutritional status among the Sonowal Kacharis of Lakhimpur district, Assam, India.

Objective

The present study aimed at assessing the nutritional status of the elderly and to examine if there is any variation in nutritional status with regard to age, sex, economic condition, diseases prevalence and self-rated health status.

Material and methods:

The present study was carried out on the Sonowal Kachari. They are one of the major plains schedule tribes of Assam. Sonowal Kacharis are Assamese speaking hinduised tribal people. They are traditionally agriculturist, having joint family in their society. At present their concentration is found in Dibrugarh, Tinsukia, Sibsagar, Jorhat, Golaghat and Lakhimpur districts of Assam.

The data comprises of 265 aged (50 years and above), where 135 are males and 141 are females. The study has been conducted during 2012-2014. Anthropometric data were collected through door to door visit. A schedule was designed and can be assessed to obtain information relating to economic status, health status, self-assessment of health, etc.

In order to determine the nutritional status, the BMI of each individual was calculated. The formula for calculating the BMI is weight (kg) divided by stature (m) squared. The grading for nutritional status was done following the James et al., (1988) classification among adults.

Data were collected from different villages of Lakhimpur district, namely, Gagaldubi, Borkhelia, Sonpur, Moinapara, Bherekichuk, Kadam Kachari, Tarioni, Nalanichuk, Gergeria, Kolaichuk, Majgaon and Sensuwa Pathar.

For the purpose of analysis the data have been divided into five economic classes according to Modified BG Prasad's Classification for October 2013 (Updated as per CPI October 2013.

Table-1: Classification of Per Capita Income

Socio Economic Status: Class	BG Prasad's Classification of 1961	Modified BG Prasad's Classification for October 2013 (Updated as per CPI October 2013)
I	Rs 100 and above	Rs 3776 and above
II	Rs 55-90	Rs 1188 to Rs 3775
III	Rs 30-49	Rs 1133 to Rs 1887
IV	Rs15-29	Rs 567 to Rs 1132
V	Below Rs 15	Below Rs 567

Correction Factor (CF) has been developed in relation to the base year of 1993-1994 as 4.93%
The Multiple factor = the value of all India CPI X 4.93/100
All India CPI for agricultural and rural labourers was 766 in October, 2013
Therefore, Multiple factor = 766 X 4.93/100=37.76
(Source: Prasad BG. Social classification of Indian families).

Results and Discussion:

Anthropometric variables

Anthropometric values are closely associated with nutrition, genetic makeup, environmental characteristics, functional status and health, social, cultural and lifestyle conditions (Garcia et al., 2007). Both height and weight are determinant of nutritional requirements of an individual (Varadaranjan & Prasad, 2009). Anthropometric values according to age and sex are shown in Table-2. The mean values of weight, height and BMI of 50-59 years age category are the highest of all the age groups in both the sexes. A declining trend of the values of all the measurements is evident from the lowest age group (50-59 years) to the highest age group (80+ years).

In general the body weight and height of the elderly tends to decrease as the age advances. However, the decrease from 50-59 years age group to 60-69 years age group is very sharp in all the measurements except the height of males. After 60-69 years, the decrease is slow and gradual in all the measurements. The height declines as result of vertebral compression, change in height and shape of the vertebral disc, loss of muscle tone and postural changes (Gracia et al., 2007). The decline in body weight perhaps results due to disproportionate loss of muscle with age. In the study, correlation of coefficient of anthropometric variables with age revealed that age was negatively correlated with all variables.The mean height, mean weight and mean BMI of elderly males were higher than females. This may be attributed to the difference in body composition of men and women. Dey et al., (1999) found that height, body weight and BMI significantly decreased in both sexes after age 70 years and showed gender difference in the trend.

Table-2: Anthropometric variable with mean and standard deviation of aged male and female

Anthrop-ometric variables	Sex	Age group										Co-rrelation coefficient (r)
		50-59 Males N=25 Females N=31		60-69 Males N=52 Females N=59		70-79 Males N=33 Females N= 38		80+ Males N=19 Females N=08		Total		
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Weight (Kg)	M	58.96	7.36	52.02	6.79	49.84	6.48	48.58	10.43	51.37	9.30	-.242**
	F	51.03	10.40	43.02	8.12	38.39	5.13	37.50	5.15	42.26	10.38	-.391**
Height (cm.)	M	159.63	5.43	159.43	2.42	158.49	5.15	158.04	4.83	159.69	5.64	-.121
	F	153.48	6.20	148.37	6.09	146.04	5.40	144.44	5.77	147.70	7.37	-.175*
BMI	M	23.07	2.41	20.54	2.32	19.82	2.36	19.45	4.09	20.17	3.41	-.214*
	F	21.52	4.28	19.39	2.81	17.86	1.96	17.91	1.76	19.23	3.73	-.221*

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The Indian Council of Medical Research (ICMR) has recommended that the average height of Indian men and women is 163 cm and 151 cm respectively. Similarly, the reference weight for man and woman should be 60 kg and 50 kg respectively (ICMR, 1990). In the study the total mean height of men (159.69 cm) and women (147.70 cm) is found to be lower than the of ICMR standard. Similarly in weight too, the total mean weight of the men (51.37 kg) and women (42.26 kg) is lower than the ICMR standard.

Nutritional status and age

Health is one of the principal assets of every human being and it has a very close association with chronological age (Bhatia, 1983). In the present study the grading for nutritional status was done following the James et al., (1988) classification of nutrition among the adults. This classification grades nutrition into five categories. They are CED malnutrition (<18.5), low normal (18.5-20.0), normal (20.1-25.0) and overweight (25.1-30.0) and obese (>30.0). The present study revealed that prevalence of CED malnutrition is higher in both sexes. CED malnutrition is found to be higher in elderly women (40.14%, table-4) than elderly men (30.25%, table-3). Prevalence of CED malnutrition is found to be more in older age groups than in younger age groups and the situation is more severe in females. In both sexes, prevalence of overweight decreased with age. The women (30.66%, table-4)

belonging to the low normal category is found to be higher than men (20.93%, table-3). Both men and women showed a declining trend in normal BMI with age. In both men (24%) and women (9.68%), overweight is found to be the highest in the 50-59 years age group. The number of women with overweight declined with the increase of age. No woman is found to be overweight beyond the age of 79 years. In men, overweight is again increased from 70-79 years onwards. Obesity is totally absent in males. No obesity is found in females as well except in the age group 50-59 years where 2.19% are obese.

With the increase of age the malnutrition is increased in both sexes, but the situation is more severe in women. As people become old they have to face certain age related problems like gradual decline in smell and taste, loss of appetite, reduced chewing efficiency, etc. which affect the calorie intake of a person and leads to malnutrition as a long term effects. Bisai et al., (2009) also found a declining trend of BMI with the age for male and female elderly. It was also reported that BMI in men is greater than in women. According to NNMB reports 2002, the prevalence of CED among the geriatric population as assessed by BMI <18.5 was relatively more among males (53.5%) than in females (49.41%). It also stated that over two decades there is reduction in the prevalence of CED in both men and women (Shankar & Balamurugan, 2011).

Table-3: Distribution of male aged according to James et al. (1987) classification

Age group	CED Malnutrition	Low normal	Normal	Overweight	Obesity	Total
50-59	02 (6.45)	15 (48.39)	08 (25.81)	03 (9.68)	03(9.68)	31
60-69	23 (38.98)	16 (27.12)	18 (30.51)	02 (3.39)	-	59
70-79	26 (66.67)	07 (17.95)	04 (10.53)	01 (2.56)	-	38
80+	04 (50.00)	04(50.00)			-	8
Total	55 (40.14)	42(30.66)	30(22.06)	6(4.38)	3(2.19)	136

(Figures in parenthesis indicate percentage)

Higher BMI values which indicate overweight and obesity are found to occur more in women than in men. In the study, obese women are found only in the younger age groups, which is a transitional phase. At that stage they have undergone pre menopause to post menopause stage, where some physiological changes occur and it may affect on their physical health. According to Javoor et al., (2008) the physiological and psychological changes in menopause have an impact on food intake and nutritional status of women. Menaupose is one of the critical periods of a woman's life during which weight gain and worsening of obesity is favoured (Khokkar et al., 2010).

Table-4: Distribution of female aged according to James et al. (1988) classification

Age group	CED Malnutrition	Low normal	Normal	Overweight	Obesity	Total
50-59	01 (4.00)	03 (12.00)	15 (60.00)	06 (24.00)	-	25
60-69	20 (38.46)	12 (23.08)	19 (36.54)	01 (1.92)	-	52
70-79	11 (33.33)	07 (21.21)	14 (26.92)	01 (3.03)	-	33
80+	07 (36.84)	05 (26.32)	05(26.32)	02 (10.53)	-	19
Total	39 (30.25)	27 (20.93)	53(41.08)	10(7.75)	-	129

Nutritional and economic status

Health awareness and health-seeking behavior are influenced by economic condition which in turn contributes to nutritional status. The economic status of a household is an important determinant of nutritional status. The studied population has been divided into five economic classes according to Modified BG Prasad's Classification for October 2013 (Updated as per CPI October 2013. For the purpose of comparison the nutritional grading is grouped into three categories. They are below normal, normal and above normal. Individuals belonging to CED malnutrition and low normal are categorized as below normal and that of overweight and obese as above normal. The number of women having below normal BMI is higher than men.

Excluding the females from income group V, the number of elderly males and females with below normal BMI increased from the highest income group (I) to the lowest income group (V). The normal BMI and above normal BMI is found to be higher among men than women. Men having normal BMI are found to be higher than women in all income groups except income category I. Majority of the elderly men (16.67%) having above normal BMI is found to be in the income group I. The men having above normal BMI decreased from income group I to income group III, thereafter it again increase. Among the women if we exclude the income group V, then we found that better economic condition have an impact on above normal BMI (table-5).

Table-5: Distribution of elderly by nutritional status and income group

Economic group	Below normal		Normal		Above normal		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
I	8 (33.33)	6 (33.33)	12 (50.0)	10 (55.55)	4 (16.67)	2 (11.11)	24	18
II	3 (15.79)	11 (57.89)	15 (78.95)	8 (42.10)	1 (5.26)		19	19
III	17 (54.84)	32 (80.0)	13 (41.93)	5 (12.5)	1 (3.22)	3 (7.5)	31	40
IV	24 (68.57)	39 (81.25)	9 (25.71)	7 (14.58)	2 (5.71)	2 (4.17)	35	48
V	14 (70.0)	8 (72.73)	4 (20.0)	1 (9.09)	2 (10.0)	2 (18.18)	20	11
Total	66 (51.16)	96 (70.59)	53 (41.08)	31 (22.79)	10 (7.75)	09 (6.98)	129	136

Irrespective of all income groups under nourished women is higher than men. Among the studied population the variation in nutritional status is associated with socio cultural factors along with economic condition. In the rural areas of Assam, more particularly among the Sonowal Kacharis the common practice is that the women (especially the married ones) do not take their meal without taking bath. They take bath only after finishing their regular household tasks- like cleaning the house and court yard, washing clothes, collecting vegetables from kitchen garden, etc. by the time they finish these works, it becomes too late to take their morning meal. Moreover, during lunch and dinner, they usually take their meal after the male adults and children take it. The women always enjoy providing best of available food to their children and other members of the family neglecting their own. These may be some of the reasons of gender variation in nutritional status.

The DHS surveys conducted in developing countries and a study in the Southern Nations, Nationalities and Peoples Region (SNNPR) of Ethiopia showed that women from low economic status households were the most affected by malnutrition (Grima & Genebo, 2002).

Nutrition and Diseases

An individual becomes more vulnerable to multiple diseases with the advancement of age and affect of which are reflected in health status (Barbhuiya & Das, 2013). Certain diseases are identified to be associated with the nutritional status of an individual. There are different natures of the diseases among the elderly people. Among the elderly Sonowal Kachari of the present study, three disorders are found to be the most prevalent chronic conditions. These disorders are- gastritis, Musculo- skeletal and high blood pressure.

Table-6: Association of individual disease (leading chronic disease) with nutritional grading

Disease	Below normal			Normal			Above normal			Total
	Male	Female	Total	Male	Female	Total	Male	Female	Total	
Gastritis	17 (60.71)	23 (62.16)	40 (61.54)	11 (39.28)	12 (32.43)	23 (35.38)	-	2 (5.40)	2 (3.08)	65 (24.53)
Musculo skeletal	12 (52.17)	19 (47.50)	31 (49.20)	7 (30.43)	13 (32.50)	20 (31.75)	4 (17.39)	8 (20.0)	12 (19.05)	56 (21.13)
High BP	2 (9.52)	3 (21.43)	5 (14.28)	9 (42.86)	5 (35.71)	14 (40.0)	10 (47.62)	6 (42.86)	16 (45.71)	37 (13.96)
No disorder	11 (16.67)	9 (9.37)	20 (12.34)	47 (88.68)	22 (70.96)	66 (78.57)	-	3 (3.33)	3 (15.79)	111(41.89)

It is found that gastritis (21.7%) is the most common form of disorders among men. This disorder is followed by the prevalence of musculoskeletal (17.83%) followed by High blood pressure (16.28%). Among the females musculoskeletal (29.41%) disorder is the most common form of disorder. This disorder is followed by gastritis (27.20%). Another most common disorder is high blood pressure (10.29%). Out of the total population 45 per cent male and 38.97 per cent females reported that they do not have any disease.

Table-6 shows the distribution of elderly suffering from different diseases according to their nutritional status. Among the elderly males and females, gastritis and musculo-skeletal disorder is highly prevalent in below normal BMI category. The higher number of males and females with high blood pressure are found in the above normal category. The incidence of this disorder rises from

below normal (14.28%) through normal (40.0%) to the above normal (45.71%) category in both men and women. Except musculo-skeletal disorder in below normal category, higher number of females are found to suffer from different disorders than males in all nutritional grading. There is a gradual decline in the incidence of the diseases with increase in BMI values except high blood pressure in both men and women (table-6).

Elderly people are susceptible to different diseases and the forms and patterns of diseases are multiples. It has been found that high blood pressure is more among the people belonging to above normal category, while gastritis is found to be higher in the below normal category. This difference may be due to socio economic factors as well as daily living style of an individual.

Irrespective of all nutritional grades Musculoskeletal problems are observed to be more

elevated among the women, except in the above normal category. There is a medical explanation for the higher occurrence of musculoskeletal disease in women than men. Generally women are smaller in size than men and have lose bone mass approximately twice as fast as men (Sarmah, 2006), due to two main factors: i.e., women have less bone mass than men in young adulthood and as a result they start out with less ability to withstand bone loss. ii. Depletion of estrogen after menopause is also believed to speed up bone loss. Along with the hormonal decrease of women the musculoskeletal disorder is accelerated by never retiring household work. Majority of the elderly who do not have any diseases are found to be in the normal BMI category.

Nutritional status and Self-rated Health Status:

In recent times, self rated health status has been gaining significance in gerontological research. For the clinical evaluation of health, objective assessment of health status is not feasible, therefore, as substitution self-reports of health is considered. Self perception of health has been proved significant to predict a variety of effects that include service utilization, emotional distress, morbidity and mortality (Kumar & Kumar, 2012). Individual's perception and evaluation of his or her overall health condition is to a great extent a subjective health rating. This may not be an accurate measure of physical health but is an indicator of life satisfaction or quality of life.

Table 7: Distribution of elderly by nutritional status and self -rated health status

Nutritional grading	Self –rated Health Status							
	Good		Very good		Bad		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
Below Normal	41 (62.12)	65 (67.71)	1 (1.51)	2 (2.08)	24(36.36)	29 (30.21)	66	96
Normal	36 (67.92)	7 (22.58)	6 (11.32)	2 (6.45)	11 (20.75)	22 (70.97)	53	31
Above Normal	4 (40.0)	3 (33.33)	4 (40.0)	1 (11.11)	02 (20.0)	5 (55.55)	10	09
Total	81	75	11	05	37	56	129	136

The respondents were asked to assess their health according to the following three options: good, very good and bad. When the nutritional status is examined with the self rated health status (table-7), it is observed that majority of the elderly rated their health status as good irrespective of nutritional grading. The highest number of males (67.92%) who responded as good was found in normal nutritional grade. But the highest number of females (67.71%) who responded as good is found to be in below normal BMI. The highest number of elderly males (40%) and females (11.11%), who responded as 'very good' was found in 'above normal' nutritional group. The highest number elderly males who considered their health as 'bad' belong to below normal category. Compared to the males, higher number of females considered their health as 'bad' in 'normal' and 'above normal' categories (table-7). It is generally said that women have a tendency to evaluate themselves as sick more often than men.

When nutritional status is compared with self-assessed health status, it has been found that majority of aged men and women responded as "bad" who belong to below normal group. While good and very good responds came from normal and above normal category. This reveals that individual's perceptions on their health conditions also reflect their deteriorating health status.

A dissimilarity between subjective self perception of health and nutritional status as per BMI standards has been observed among the studied Sonowal Kachari population. A substantial proportion of the people assume to be in good health according to their self rated health status. This situation may reflect that though their physical health is deteriorating, their emotional or mental health condition is well enough. Or they may consider that the declining physical health is an expected condition in ageing process. They are of the opinion that they maintain a better health than the younger generation.

Self-assessment may have some relation to the prevalence of disease, functional ability and economic condition of an individual. It is also observed that people from lower economic condition have mostly assessed their health as 'poor' (Sarmah, 2006).

Conclusion:

The present study reveals that the frequency of CED under nutritional status is high among the elderly Sonowal Kachari. Among the studied population, under nutrition may lead to increased morbidity along with functional disability. It creates more complexity for women as compared to the elderly men. Generally, at household level, cultural norms and practices and socio-economic

factors determine the extent of health problems. Change in socio-economic status and various health problems adversely affect an individual's way of life during old age. The present study reveals an increasing burden of varying health problems towards the elderly people. Therefore, health of this vulnerable section of population needs to be looked into holistically, so that timely intervention can be made against this silent wave.

Acknowledgement

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