Nutritional Risk and its Associated Factors among Elderly Women in Rural Old Age Homes, West Bengal, India

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ABSTRACT:
Objectives: Present study aims to explore the nutritional risk of the elderly women and also to find out associated psychological and socio-economic factors, (if any) with nutritional risk or malnutrition.
Design: It is a cross-sectional study conducted among institutional elderly women.
Setting: The study was conducted among elderly women (aged 60 years and above) residing in six Old Age Homes located in the rural West Bengal, India.
Participants: The study included 95 participants residing in rural Old Age Homes.
Measurements: For this particular study a pre-designed survey schedule containing Mini Nutritional Assessment (MNA) Scale and Geriatric Depression Scale (GDS) were used. Intergroup comparison was performed, Chi-square test performed to find out association between/among variables.
Results:
From the study it revealed that out of 78 'possibly malnourished' elderly women, 38 participants (40%) were 'at risk of malnutrition' and another 40 participants (44%) were 'malnourished'. About 53.68% participants having moderate depression, were 'at risk of malnutrition', whereas 40% of them having severe depression were 'malnourished' ($x^2=3.427$, $p<0.001$).
Conclusion:
High proportion of 'at risk of malnutrition' and 'malnutrition' associated with presence of psychological stress and different grade of depression were the major areas of concern.

Keywords: Depression, Elderly women, Malnutrition, Old Age Homes

INTRODUCTION:

Aging is an inevitable biological process which starts from conception and ends after death. United States defined 65 years of age as the onset of old age by the Social Security Act, 1935. Whereas, in Britain, the Friendly Societies Act (1875), enacted the definition of old age as, "any age after 50", but pension schemes mostly arranged after 60 or 65 years of age (Roebuck, 1979). But, in India, Ministry of Social Justice and

Empowerment (MSJE), Government of India adopted 'National Policy on Older Persons (NPOP)' in January, 1999 where it defined that 'senior citizen' as a person who is 60 years old or above.

Increased life expectancy has contributed to an increase in the number of persons 60+. From only 12 million persons 60+ in India in 1901, the number crossed 24 million in 1961 and 55.30 million in 1991 and in 2001 it had gone to 76 million and again in 2011 it reached at 104 million and it is expected that this figure will grow to 173 million by 2025, future increasing to about 240 million by 2050. As per Census of India projections, the percentage of elders as a percentage of total population in the country would jump from 8.6% in 2011 to 12.4% in 2026 and touch 19.7% in 2050. In 2011, India had about 104 million seniors above the age 60 years and it is expected that this figure will grow to 173 million by 2025, future increasing to about 240 million by 2050. So, life expectancy in India has almost doubled from 33 years at the time of independence to the present 62 years and India is one of the few countries where the sex ratio is biased favoring males at all ages. But the change now is visible in older age groups where women are out numbering men (Bagga, 1999).

Traditionally, the family has been the primary source of care and material support for our older adults. The Indian family system is often held a high position for its qualities like support, strength, duty, love and care of the elderly. But the process of aging has brought major transformations in the family in the form of structural and functional changes (Vijayakumar, 1999). So, due to consequent change in family structure the elderly lose their relevance and significance in their own house and start feeling lonely. Therefore, they admitted in such institutions are popularly known as *Vriddhashrama* which is a synonym of Old Age Home (here after OAH). Simultaneously, they are suffering from various health related hazards (Waters et al. 2010; Zahra and Mahshid, 2015), risk of under nutrition (Arlappa et al. 2003; 2005; 2009; 2016), cognitive as well as functional decline (Naidoo et al. 2015; Singh et al. 2014). Out of which malnutrition or risk of under nutrition may obstruct their all socio-economic, health and psychological tasks in twilight years. It is strikingly point out that such miserable conditions are two-folded for those who are residing in Old Age Homes (OAH) and if they are women.

Elderly women residing in OAHs seem more vulnerable to all the threats of nutritional risk owing to their isolation from the family, meager income, psychological stressors and limited access to health care and lack of self-care (Beevi, 2008; Devi and Bagga, 1997). Keeping the above background in mind, the present study was conducted among elderly women residing at OAHs of rural West Bengal with the objective of finding out psychological and basic socio-economic factors, if any associated with malnutrition and risk of malnutrition.

MATERIAL AND METHODS:

The present cross-sectional study was conducted among only 95 elderly women of 60 years and above in six OAHs located in rural areas of five districts (Birbhum, Howrah, Nadia, Purba Medinipur and Purulia) of West Bengal, India. Prior to the sampling, a list of OAHs was prepared from different secondary sources like Help Age India Old Age Homes Directory, websites of different district websites. From the list only such OAHs have been selected those cater their services only for women. There are altogether six OAHs exclusively for the residence of elderly women in the study area. Verbal consents from all the inmates were received before their participation in this study. OAH wise distribution of the study population is given in the table 1.

Table 1: Detailed information about studied Old Age Homes

Sl. No	Name of Old Age Home	Location	Year of Establishment	No. of Participants
01	St. Vincent's Old Age Home	Purulia	1983	13
02	Kheya Old Age Home	Purba Medinipur	1993	22
03	Radhakrishna Ashram/ Karimpur	Nadia	1994	21
04	Chandranath Basu Seva Sangha	Nadia	1998	18
05	Village Welfare Society Briddhashram	Howrah	1998	16
06	Hindu Dharma Sevika Ashram	Birbhum	2004	05
			Total Participants	95

Study tools include one pre-designed schedule to collect background information, Mini-Nutritional Assessment (MNA) Scale, Geriatric Depression Scale (GDS), anthropometric rod (height measurement), weighing balance (weight measurement) and measuring tape (MAC, Waist, Hip measurement).

Mini-Nutritional Assessment (MNA) Questionnaire:

It provides a simple, rapid and useful (Reuben et al. 1999) assessment of nutritional risk by asking 18 weighted items and each item assigned a weighted score ranging from 1 to 3 points and have a total score of 30 points. These 18 items derived from 4 groups namely anthropometric assessment, general assessment, dietary assessment and subjective assessment i.e. self-perception of health and nutrition (Guigoz et al. 1996). There are two parts in MNA. Part-I contains 6 screening questions and Part-II contains 12 assessment questions. The scoring pattern is mentioned below-

Part-I: 12 to 14 (Normal); and ≤11 (Possible malnutrition)

Part-II: > 24 (Well nourished); 17 to 23.5 (Risk of malnutrition); ≤17 (Malnutrition)

If score of part-I is less than 11 then part-II is applied.

Geriatric Depression Scale (GDS):

The Geriatric Depression Scale (GDS), first created by Yesavage et al. (1983) has been tested and used extensively with the older population. The GDS is one of the most frequently worldwide used tools to screen for depression in the elderly, in the clinical as well as research context. The GDS Long Form is a brief, 30-items questionnaire related with 7 common characteristics of general life, namely somatic concern, lowered affect (affect is the outward expression of emotion), cognitive impairment, feelings of discrimination, impaired motivation, lack of future orientation and lack of self esteem. The questions of GDS have only 2 options: Yes and No. The scoring pattern is mentioned below-

0 to 9 = Normal

10-19 = Mild Depression

20-30 = Severely Depression

Both questionnaire were translated into Bengali, the vernacular and was retranslated into English. A pilot survey was then conducted using the two sets of both the questionnaire (using the original and the retranslated version with a gap of seven days) on inmates of other OAHs in the study area that was not included in the final study.

Statistical analysis was done using SPSS (version 20.0). Results were expressed in percentage; inter-group comparison was performed using chi-square test. A 'p' value of <0.05 was considered to be statistically significant.

RESULTS:

The study revealed that the mean age of the participants was 71.63 years (SD=7.197), ranging from 60 years to 89 years [table 2]. A descriptive statistics of the anthropometric measurements (height, weight, BMI, MUAC and CC) also presented in that table. Table 3 shows that majority of the study population belonged to 60-69 years of age group (53.68%) and a sizable percentage (34.74) belonged in the age group 70-79 years. Majority of the inmates were widow (54.74%), about 61.00% were literate, and more than three fourth (77.89%) participants were unemployed. The measurements were incorporated in the MNA scale. According to MNA score, 82.00% (78/95) elderly women were identified and short listed as 'possibly malnourished'. Among these 78 shortlisted 'possibly malnourished' elderly women, 38 (40.00%) were at risk of malnutrition and 40 (42.00%) were malnourished group [figure 1]. A sizable percentage of participants (21.05%) of those who were 'at risk of malnutrition' were employed presently, whereas majority of malnourished population (90.00%) had no job (df=1, x^2=1.829, p=0.046) [table 3]. GDS was performed on the shortlisted population. Psychological stress was present among 89.47% of 'at risk' population and 100% malnourished population and the difference was statistically significant (df=1, x^2=2.093, p=0.039) [table 4].

Table 2: Descriptive statistics of anthropometric measurements derived from MNA scale

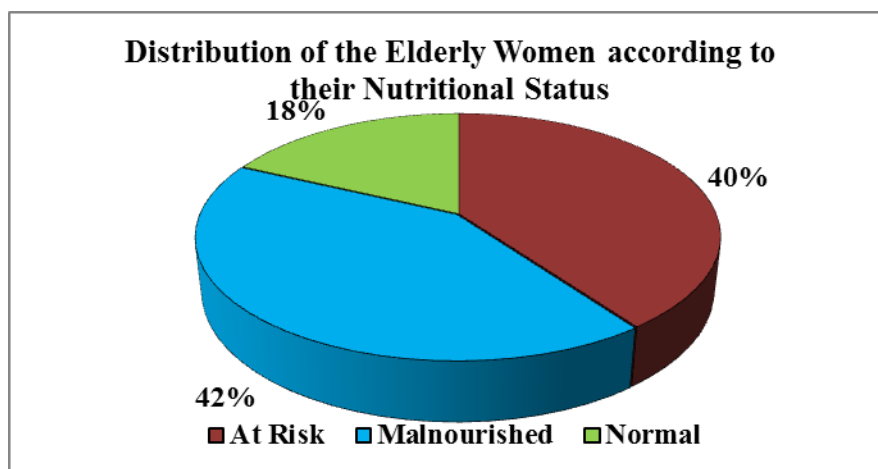| Variables	Mean	SD	Range
Age (years)	71.63	7.20	60-89
Height (cm.)	157.32	9.42	129-172
Weight (kg.)	50.07	10.95	23-74
Body Mass Index (BMI) (kg/m²)	21.22	3.96	13.49-32.84
Mid Upper Arm Circumference (MUAC) (cm.)	22.86	4.63	14-34
Calf Circumference (CC) (cm.)	27.71	4.39	18-39

Figure 1: Distribution of the Elderly Women according to their Nutritional Status

From the table 3, it was observed that among that women belonging to 'at risk of malnutrition', 50.00% belonged in the age group 60-69 years; followed by 70-79 years (34.21%). On the other hand, among the 40 malnourished women, 47.50% belonged to 60-69 years of age group, and 38.46% in the age group 70-79 years. The association between nutritional risk and age-group was not statistically significant (df=2, x^2=0.883, p=0.643. The study also found that most of the widow elderly are malnourished (67.50%) compared to 'at risk' (34.21%). The separated or divorced elderly are doubly susceptible in malnourishment (10.00%) and the association between them is statistically significant (x^2=13.057, p=0.005) at .05 level.

Table 3: Distribution of 'At Risk' and 'Malnourished' population according to socio-demographic characteristics

Socio-demographic characteristics	At Risk Women [n=38 (%)]	Malnourished Women [n=40 (%)]	Total [n=78 (%)]	Chi² (df=1#/2##)	p-value*
Age group (in years)					
60-69	19 (50.00)	19 (47.50)	38 (48.72)		
70-79	13 (34.21)	17 (42.50)	30 (38.46)	0.883##	0.643
80-89	06 (15.79)	04 (10.00)	10 (12.82)		
Marital Status					
Married	16 (42.11)	04 (10.00)	20 (25.64)		
Unmarried	07 (18.42)	05 (12.50)	12 (15.38)		
Widow	13 (34.21)	27 (67.50)	40 (51.28)	13.057##	0.005*
Separated/ Divorced	02 (05.26)	04 (10.00)	06 (7.70)		

Educational Status					
Literate	20 (52.63)	24 (60.00)	44 (56.41)	0.430#	0.512
Illiterate	18 (47.37)	16 (40.00)	34 (43.59)		
Employment status					
Employed	08 (21.05)	04 (10.00)	12 (15.38)	1.829#	0.046*
Unemployed	30 (78.95)	36 (90.00)	66 (84.62)		

*Statistically significant at 0.05 level.

According to presence of psychological stress using GDS (N=74), all the malnourished elderly and 89.47% 'at risk' participants fall in psychological stress i.e. depression [table 4]. Presence of psychological stress and nutritional state are significantly correlated.

Table 4: Distribution of 'At Risk' and 'Malnourished' population according to presence of Psychological Stress

Presence of Psychological Stress	At Risk (%)	Malnourished (%)	Total (%)	p-value
Yes	34 (89.47)	40 (100.00)	74 (94.87)	$X^2 = 2.093$, P=0.039*
No	04 (10.53)	---	04 (05.13)	
Total	38 (100.00)	40 (100.00)	78 (100.00)	

*p<0.005 p-value was calculated after comparing values of 'at risk of malnutrition' and 'malnutrition' groups by using chi-square test with degree of freedom 1.

It also observed that among that women belonging to 'at risk of malnutrition', 31.58% had severe depression, 57.89% had mild depression and 10.53% had no depression. On the other hand, among the 40 malnourished women, 50.00% had severe depression and another 50.00% had mild depression. About 57.00% of women having mild depression were 'at risk' whereas 31.58% were 'malnourished' and the difference was statistically significant (df=2, x^2=3.427, p=0.008) [table 5].

Table 5: Distribution of 'At Risk' and 'Malnourished' population according to Grade of Depression

Grade of Depression	At Risk (%)	Malnourished (%)	Total (%)	p-value
Normal	04 (10.53)	-	04 (05.13)	$X^2 = 3.427$, P=0.008**
Mild	22 (57.89)	20 (50.00)	42 (53.85)	
Severe	12 (31.58)	20 (50.00)	32 (41.02)	
Total	38 (100.00)	40 (100.00)	78 (100.00)	

**(p<0.001 p-value was calculated after comparing values of 'at risk of malnutrition' and 'malnutrition' groups by using chi-square test with degree of freedom 2.

DISCUSSION:

The present study showed that 40.00% of the women inmates were at risk of malnutrition and 42.00% were malnourished, while only 18.00% among them were well nourished according to MNA score. Thus, it appears that malnutrition is much higher among the elderly women residing in rural Old Age Homes. The malnutrition status was found to be higher among the inmates who are more aged, similar to the findings of Sordestrom et al. (2013), widow, absence of formal education and unemployment (Arlappa, 2009; 2016). However, except advanced age and educational status other two factors i.e. marital (0.005) and present employment status (0.046) were also statistically significant. The unemployed elderly female inmates were at about 5.5 times more risk of malnutrition (84.62%) as compared to those who were presently employed (15.38%). A study (Abdelrahman and Elawam, 2014) from Egypt has also identified unemployment as a risk factor for malnutrition among the elders. This finding can be explained by the fact that the employed inmates possibly could have good financial status which support in good access to consumption of nutritional foods.

The rate of malnourishment was more among the present study population than the findings reported by Kikafunda and Lukwago (2005); Kabir, et al. (2006); Vedantam et al. (2010); Lahiri et al. (2015); Mathew et al. (2016); Ghimire, et al. (2017). But these studies were conducted among the community dwellers. From this observation it is assumed that the institutionalized elderly are more prone to malnutrition that the community dwellers (Vedantam et al. 2010; Yadav et al. 2012; Zahra and Mahshid, 2015; Zareen and Vasundhara, 2016). And the prevalence of malnutrition is too progressive if the inmates are female as found in the present study. In the current study, prevalence of malnutrition was high among the inmates, which are similar to the findings conducted at Vellore of Tamilnadu (Vedantam et al. 2010), West Bengal (Lahiri et al. 2015) and Haryana (Mathew et al. 2016). These studies also stated that the prevalence of malnutrition was higher among the elderly females as compared to their male counterparts.

In the current study it also found that about 95.00% of the inmates had depression. Among the depressed inmates 53.85% had mild depression and another 41.02% had severe depression. The presence of severe depression was higher among the

inmates who were malnourished. However, malnutrition and the presence of depression were statistically significant (0.008). So, it may be stated that psychological stress i.e. depression is one of the main factor of malnourishment as also stated by the study of Agarwalla et al. (2015).

CONCLUSION:

The present study revealed high level of malnutrition and risk of malnutrition among elderly women residing in OAHs in rural West Bengal, India. Significant association was observed between nutritional risk and their growing age, marital and current employment status as well as presence of psychological stress and between nutritional risk and different grades of depression. Women with insufficient monthly income also found to have poor nutritional status. Early nutritional intervention should be implemented especially to those who were 'at risk of malnutrition' to halt their progress towards malnutrition and also for already malnourished population for restoration of normal nutritional status. More extensive and in depth studies of longitudinal design with qualitative research components to probe into the causes and consequences of such grave and pertinent public health problems are required.

Limitation of the Study:

The study was conducted among only 95 elderly women residing in rural Old Age Homes of a particular state (West Bengal) of Indian union. Therefore, the findings of the study may not even be generalized for inmates of rural as well as urban OAHs located different States and Union Territories of India and abroad. Precisely, a large scale any qualitative research method was not adopted that might lead to more detailed assessment of the factors contributing status of the study population.

Financial Support and Sponsorship: Nil.

Conflicts of Interest: There is no conflict of interest.

Ethical Standard:

The present study was conducted in accordance with the principles for human experimentation. Prior permission to conduct the study was obtained first from the management of the respective Old Age Home. Then informed consent was obtained

from all participants included in the study after direct communication regarding the objective, nature and benefits of the study.

Acknowledgement:

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