Dr. Vinutha U Muktamath
Assistant Professor, Department of Human Development and Family Studies, College of Community Science, UAS Dharwad, Karnataka, India

Pushpa B Khadi
Retired Professor (HAG), Department of Human Development and Family Studies, College of Community Science, UAS Dharwad, Karnataka, India

Priya Ramesh Hegde
Ph.D. Scholar, Department of Human Development and Family Studies, College of Community Science, UAS Dharwad, Karnataka, India

Aishwarya Koppad
Graduate Assistant, Department of Human Development and Family Studies, College of Community Science, UAS Dharwad, Karnataka, India

Corresponding Author:
Dr. Vinutha U Muktamath
Assistant Professor, Department of Human Development and Family Studies, College of Community Science, UAS Dharwad, Karnataka, India

Nutritional status of rural elderly of Dharwad district: An intervention study

Dr. Vinutha U Muktamath, Pushpa B Khadi, Priya Ramesh Hegde and Aishwarya Koppad

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Abstract
Elderly population are distinctively predisposed to physical and mental health problems. Nutritional interventions could play a part in the enhancement of quality of life of elderly. The present study was conducted to know the nutritional status of elderly in the rural community of Dharwad district of Karnataka and to provide intervention and to assess the impact of intervention on nutritional status of elderly.
Study was conducted during the year 2018– 2019 at University of Agricultural Sciences Dharwad, as a part of the project on "Intervention for Active Ageing" funded by University Plan Grants. A sample of 161 elderly of 60+ years were participated. Findings revealed that 66.50 per cent were at risk of malnutrition, 22.40 per cent were having normal nutritional status and 11.20 per cent were malnourished. The educational intervention programme was provided to the elderly it was found to be effective in improving the nutritional status among rural elderly.

Keywords: Rural, elderly, nutritional status, intervention

Introduction
Ageing, an irrevocable biological process encompasses health-related, social, cultural, and economic dimensions. On an account of better education, better health facilities and increase in life expectancy, there is an unparalleled increase in human longevity. The population of elderly is on the rise, both in developed and developing countries and has resulted in the occurrence of demographic revolt. This transition is predicted to maintain well in the coming decades. India's elderly population constitutes 8.31 percent of the world's population and is expected to rise to 12.4 percent in 2026, to 19 per cent in 2050 according to the United Nations Population Division (UN, 2011). In India the percentage of elderly population constituted 104 million with 53 million females and 51 million males according to 2011 census. Majority of the elderly persons live in rural areas. India's older population will increase dramatically over the next four decades. It is projected to increase to 133.32 million in 2021, 178.59 million in 2031, 236.01 million in 2041 and 300.96 million in 2051 (Statista, 2020) [6].
Alongside with the rapid aging, a transition of illness causing the population to suffer has occurred from infectious diseases to non-communicable diseases such as obesity, diabetes, cardiovascular diseases and cancer. The high occurrence of chronic diseases raises the issue well being of elderly. Elderly population are uniquely susceptible to physical and mental problems because of physiological, psychological and functional changes that occur with ageing. The needs and problems of the elderly vary significantly according to their age, socio-economic status, health, living status and other such background characteristics (Mane, 2016) [11]. Care of elderly necessitates addressing several social issues. Recently, under the Universal Health Coverage (UHC) framework recommendations have prioritized primary and secondary prevention and health promotion, with the goal of creating enabling environments for healthy lifestyles, early detection, and routine screening among the aged and avoiding institutionalization [Dey *et al*. 2012] [3]. The Government has made efforts to tackle the problem of elders' economic insecurity by launching schemes such as the National Policy on Older Persons, the National Old Age Pension Programme and the Annapurna Programme. It must be remembered that comprehensive care to the elderly is doable only with the

involvement and collaboration of family, community and the Government. All social service institutions in the country need to address the social challenges to elderly care in order to improve their quality of life. In addition, there is also a need to develop an integrated and responsive system to meet the care needs and challenges of elderly in India. The priority initiative will be to have a minimal needs programme that should include primary care, nutritional requirements, provision of assisted devices, counselling services, social safety measures and pension, community guidance for elderly care at home and referral care for those who need it. (Dey AB).

Health is greatly influenced by nutrition. Under nutrition is harmful leading to frailty, physical dependence and premature death apart from impairment of the immune system, increased risk of infectivity and poor wound-healing. The energy requirement declines with age due to reduction in the body mass, body metabolism and physical activity. Yet older people are at high risk of under nutrition due to several reasons, namely; lack of teeth, gum problems and ill-fitting dentures make eating painful, reduced appetite due to lack of exercise, loneliness, depression, chronic debilitating diseases, confusion and forgetfulness. Available data for malnutrition worldwide shows that the prevalence of malnutrition as rated by the Mini Nutritional Assessment Short Form (MNA – SF) among the elderly is 0–8% for those living in a community, 0–30% among the non-institutionalized elderly and 0–74% for the hospitalized and institutionalized elderly (Shivraj *et al.*, 2014) [13]. An attempt was made to study the nutritional status of older adults in the rural community of Dharwad district of Karnataka and to provide intervention and assess the impact of intervention on nutritional status of elderly.

Methodology
The study was conducted during the year 2018– 2019 as a part of the project on "Intervention for Active Ageing" funded by University Plan Grants. A non- experimental research design with single group pre test and post test was employed to know the impact of intervention programme in improving the nutritional status among elderly. Elderly of Dharwad district from four villages participated in the intervention. Informed written consent was obtained from the elderly. At the beginning 161 elderly joined the programme. But towards the end of the programme (8 to 10th week) 123 of them retained. Post testing was carried out by administering the tool once again on 123 elderly to know the nutritional status.

The tools and measures used were the Mini Nutritional Assessment (MNA) developed by Guigoz, *et al.* (1994) [4] which is one of the few validated screening tools for this age group. It is a simple and non-invasive screening/diagnostic tool which has been validated over time in different countries and in different sections of people. The MNA provides a simple and quick method of identifying elderly persons who are at risk for malnutrition or who are already malnourished. It comprises of 18 questions, with 'yes' or 'no' options. The scores ranges from 0-30 and categorized as Normal nutritional status with 24-30 points, At risk of malnutrition with 17 to 23.5 points and malnourished less than 17 points.

The Personal information regarding their age, education, income, occupation, family composition and family possessions was collected. The anthropometric parameters such as height, weight, calf circumference and mid-arm circumference were considered. The height was measured using anthropometric rod, weight by a calibrated weighing balance and calf circumference and mid-arm circumference were measured using non-elastic measuring tape.

The intervention was educational in nature and nutritious salads, malts and health drinks were provided in order to convince the elderly about the importance of quality foods and to develop a taste for such foods. The intervention was for a day /week with two sessions per day for 4-5 hours. The duration was 10 weeks for a/batch of 35-45 elderly from one village. A total of 40-50 hours for each batch. Four batches consisting of 161 elderly participated in the intervention programme at their respective villages. Knowledge on the aspects for restoration of physical health through nutrition and exercise, good eating habits, positive attitude towards ageing, social participation and recreational activities, mental health issues were provided.

Results and Discussion
The percentage distribution of elderly on nutritional status and its association with age, gender are presented in table 1a to table 1b. From Table 1a, it is evidenced that irrespective of gender, majority of the elderly were in the category of 'At risk' of malnutrition (66.45%), and 22.37 per-cent were with normal nutritional status. Majority of both male (63.56%) and female (74.42%) elderly were found to be 'At risk of malnutrition' and 25.43 percent male and 13.96 percent female elderly were with normal nutritional status, while 11.01percent male and 11.62 percent female elderly were malnourished. There was no significant association between gender and the nutritional status at pre test.

Table 1a: Nutritional Status of elderly by gender

N=161

Nutritional Status	Gender		Total	Chi- square
	Male	Female		
Malnourished (< 17)	13 (11.01)	5 (11.62)	18 (11.18)	
At risk of malnutrition (17-23.5)	75 (63.56)	32 (74.42)	107 (66.45)	2.42NS
Normal nutritional status (24-30)	30 (25.43)	6 (13.96)	36 (22.37)	
Total	118 (100.00)	43(100.00)	161 (100.0)	

Figures in parenthesis indicate percentages NS-Non-significant,

Nutritional Status of elderly by age: Majority of the oldest old elderly (60%), 80.0 percent old old and 62.82 percent of young old elderly were found to be 'At risk' of malnutrition, while 40.0 percent oldest old, 24.79 percent young old and 11.43 percent old old elderly were with normal nutritional status. The findings (Table 1b) illustrates that nutritional status among elderly was not significantly associated with age at pre test.

Table 1b: Nutritional Status of elderly by Age

N=161

Nutritional Status	Age			Total	Chi-square
	Young old	Old old	Oldest old		
Malnourished (< 17)	15 (12.39)	3 (8.57)	-	18 (11.18)	
At risk of malnutrition (17-23.5)	76 (62.82)	28 (80.00)	3 (60.00)	107 (66.45)	5.06[NS]
Normal nutritional status (24-30)	30 (24.79)	4 (11.43)	2 (40.00)	36 (22.37)	
Total	121(100.00)	35 (100.00)	5 (100.00)	161 (100.00)	

Figures in parenthesis indicate percentages NS-Non-significant,

Impact of intervention programme on nutritional status of elderly was represented in Fig 1. and Table 2a.

Impact of Intervention programme: Percentage distribution of elderly by their nutritional status at pre and post test is presented in Fig 1. At pre-test, majority of the elderly were found to be 'At risk of malnutrition (66.5%), 11.12 percent were malnourished and 22.4 percent were with normal nutritional status. But at post-test 62.60 percent elderly were with normal nutritional status and 37.40 percent elderly were 'at risk' of malnutrition. None of the elderly were malnourished.
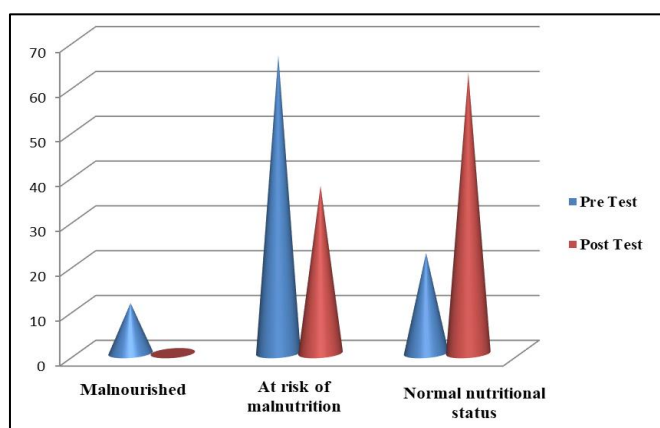

Fig 1: Nutritional Status among elderly at Pre test and Post Test

Table 2a shows difference between nutritional status of elderly at pre and post test. The comparison of mean scores between pre-test (21.75) and post test (23.91) indicated that there was noticeable positive increase in the nutritional status among elderly. There was significant difference (t = 12.16*) in the nutritional status of elderly from pre test to post test, which revealed that intervention programme significantly influenced the elderly in enhancing their nutritional status by adopting good and healthy eating practices.

Table 2a: Comparison of mean scores of nutritional status among elderly at Pre and Post test

Pre test		Post test		Paired t-value
Mean	SD	Mean	SD	
21.75	2.86	23.91	1.92	12.16*

Discussion
A high percentage of elderly were 'at risk' of malnourishment and malnourished. There was no significant association between age, gender and marital status with nutritional status at pre test. Kansal *et al.* (2016) [8] found a high prevalence of elderly individuals who were malnourished and were at risk of malnutrition and the association of gender and nutritional status of elderly was not found to be statistically significant (p = 0.735.) Lahiri *et al.* (2014) stated that MNA showed 29.4% elderly had malnutrition and 60.4% were at risk of

malnutrition. Females (59.4%) were significantly more malnourished than males (40.6%). Older age (*p< 0.001*), lower income of family (*p< 0.001*), low literacy level (*p< 0.001*), decreased food intake (*p< 0.001*), and fewer consumption of meals (*p< 0.001*) were independently associated with lower MNA scores. The findings of some previous studies have shown that older age was associated with the lower MNA scores in the population (Cuervo *et al.* 2009, Kabir *et al.* 2006) [1, 7] whereas others have shown that age has no effect on the nutritional status (Soini *et al.* 2004, Iizaka *et al.* 2008) [5].

Highly significant difference in the nutritional status from pre test to post test among elderly was observed. There was noticeable positive increase in the nutritional Status scores among elderly which revealed that intervention programme significantly influenced the elderly in enhancing their nutritional status by adopting good and healthy life practices such as drinking luke warm water, consumption of nutritious vegetable salad, yoga, exercises and other various practices for good physical and mental health status and remedies to overcome the health problems. Majumdar *et al. (*2012) showed that the impact of education intervention programme on the nutrition and health knowledge of elderly residents had significantly improved in all the participants after the education intervention programme. Elderly resident showed significant improvement in nutrition knowledge scores (15 to 43%). Manders (2006) [10] studied the effectiveness of nutritional supplementation in improving cognitive functioning in elderly people.

Conclusion
Majority of the elderly were in the category of at risk of malnourishment and malnourished. Nutritional status improved significantly from pre test to post test. None of the elderly were found to be malnourished at post test. Intervention programme was found to be effective in improving the nutritional status among rural elderly.

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