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Association between Nutritional Status and Decline in Functional Capacity among Female Geriatric Population

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Abstract

Introduction: Developing nations like India are experiencing epidemiologic health transitions inducing an increase in life expectancy and increase in elderly population. Deterioration of the nutritional status may lead to unwanted dependence on others compromising the functional capacity of elderly. The objective of this study was to find association between nutritional status and functional dependence among female geriatric population in Delhi city. **Methods:** A cross sectional study was conducted from December 2018 to February 2019 and 200 female geriatric study participants aged 60 years and above were selected using simple random sampling. Data was collected using Lawton scale of Instrumental activities of daily living, Katz Index of Activities of Daily living and mini nutritional assessment scale by interview method and analysed using chi square test.

Results: The prevalence of ADL dependence was 16% with highest dependence in dressing followed by toileting. The prevalence of IADL dependence was 63% with highest dependence in shopping followed by preparation of meals. Dependence increased in malnourished individuals while significantly improving in nutritionally adequate individuals. **Conclusions:** Significant association was found between nutritional status and functional capacity decline. Regular physical exercise, healthy diet, economic independence, support by family, regular health check ups, legal security and special schemes for the elderly can improve their functional capacity and promote healthy aging.

Key words: Functional Dependence, Nutritional Status, ADL, IADL.

Introduction:

The world is facing a shift in the age structure from young to old. This demographic transition is associated with reducing fertility, decline in mortality and increasing survival in geriatric population. For the first time in world's history, the percentage of elderly will rise from 12% to 22% by 2050^[1]. In India, the number of aging population has risen from 77 million in 2001 to 104 million in 2011. It is estimated that by 2050 the number will increase by 3 times and reach 300 million^[1].

Decline in nutritional status affects and is affected by functional dependence among the elderly ^[3]. Mini Nutritional Assessment (MNA) Scale can be used to assess the risk of malnutrition in the elderly. It is a simple, low cost and non-invasive method ^[4]. Sensitivity of MNA is 96% and



specificity is 98%. MNA helps to classify individual as normal nutritional status, risk of malnutrition and malnourished. It contains anthropometric indicators and information on food intake, weight loss, mobility- bed or chair bound, psychological stress, neuropsychological problems and Body Mass Index.

Due to aging there is progressive decline in body stamina and immunity [2] compromising the functional capacity of an individual [2]. Functional capacity is the ability of an individual to perform living task independently and consist of Activities of Daily Living (ADL) and Independent Activities of Daily Living (IADL)[5]. ADL includes self-care activities such as bathing, dressing, toileting, transferring, continence and feeding. IADL includes telephone use, shopping, preparation of meals, housekeeping, laundry, transportation use, self-medication and handling money. Identifying individuals with risk of diminished functional capacity can help in development of interventions which may prevent further loss [6].

Among elderly only few studies were conducted on functional capacity in North India. The objective of this study was to find the prevalence of functional dependence and its association with nutritional status.

Methodology:

A cross sectional study was conducted from November 2018 to February 2019 in areas of South Delhi, New Delhi, India among female elderly individuals aged 60 years and above. 200 samples were selected and data was collected from the subjects after taking their consent.

Random sampling method was used to collect data. Out of 25 major wards in South Delhi, 5 wards were selected randomly and 40 participants were selected from each ward. Only those subjects willing to participate were included in the study. Subjects with any disability interfering with proper communication were excluded. Data collection was done using a structured questionnaire.

ADL was assessed using Katz Index and IADL was assessed using Lawton scale. Nutritional status was assessed using Mini Nutritional Assessment Scale. While administering IADL if participants were not doing a particular activity then participants response was based on whether they can perform the activity if they were supposed to do it. Ethical approval was taken from Institutional Ethical Committee and written consent forms were filled by participants.

Data was analysed using STATA 14.0 version. Socio-demographic variables were represented by percentages. Association between functional capacity and nutritional status was found using chi square test.

Results

A total of 200 female elderly subjects were studied. Majority of them were in the age group of 60-64 years (53.5%). Mean age of subjects was 66.63 ± 6.14 years. 33% of them were illiterate and 24.5% has basic education. Socio economic status was assessed by Kupuswamy Scale. Middle upper and Middle Lower ie. Middle class together constituted more than half of the population (58.5%).



Table 1: Socio-demographic characteristics of surveyed individuals

N= 200		
Age	66.63±6.14	
Education	N	%
Graduate & above	65	32.5
High School	20	10
Basic Education	49	24.5
Illiterate	66	33
Occupation		
Employed	49	24.5
unemployed	151	75.5
Marital Status		
Married	121	60.5
Widowed	79	39.5
Economic class		
Upper	34	17
Middle (upper)	81	40.5
Middle (Lower)	36	18
Lower	49	24.5

According to MNA, individuals were classified into adequate nutritional status (42.5%), risk of malnutrition (34.5%) and malnourished (25%).

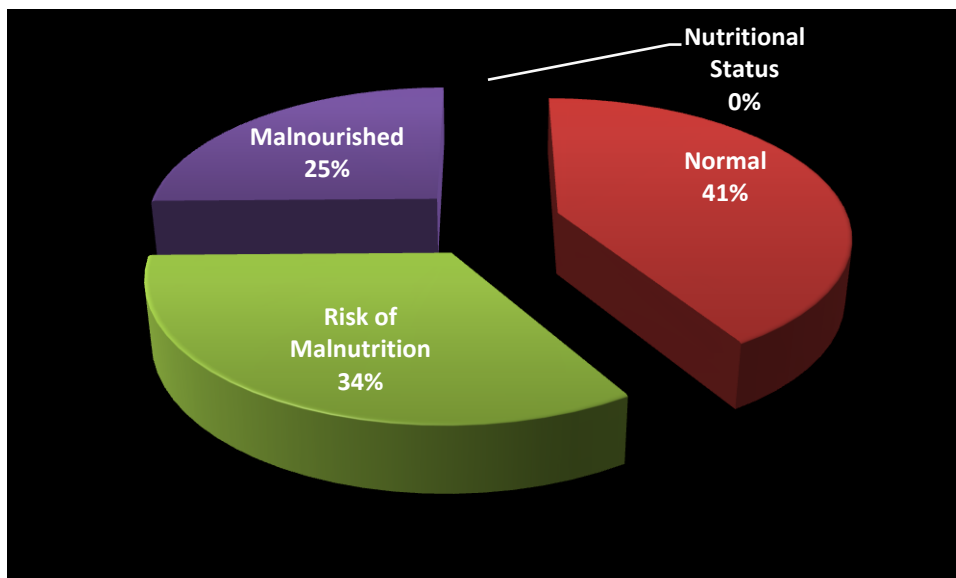


Figure 1: Distribution of study participants according to nutritional status



Among malnourished individuals, independence in ADL and IADL variable significantly deteriorated. In ADL variables the highest level of dependence was found in dressing (23%) followed by using toilet (22%). In IADL variables the highest level of dependence was found in shopping (26%) followed by preparation of food (22%). Total prevalence of dependence in ADL variables was 16% and IADL variables was 62%.

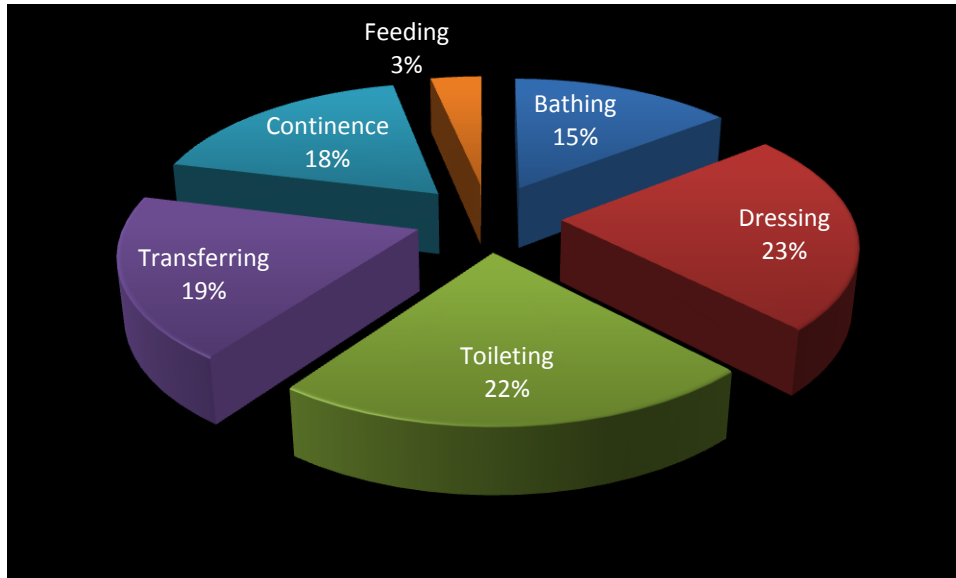


Figure 2: Distribution of study participants according to Activities of Daily Living

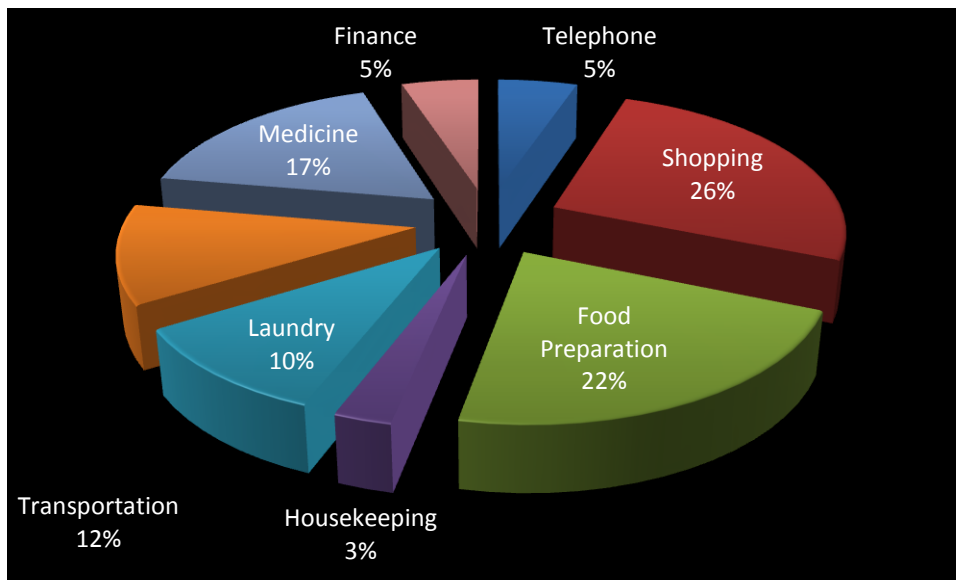


Figure 3: Distribution of study participants according to Instrumental Activities of Daily Living



Table 2: Activities of Daily Living distributed according to the nutritional status among the study

Variables	Answers	Normal Nutritional Status		Risk of Malnutrition		Malnourished		Chi-square
		N=85		N=69		N=46		
		N	%	N	%	N	%	
Telephone use	Dependent	5	15.15	15	45.45	13	39.39	p= 0.002 $\chi^2=12.94$
	Independent	80	47.9	54	32.34	33	19.76	
Shopping	Dependent	57	34.13	64	38.32	46	27.54	p= 0.000 $\chi^2=30.05$
	Independent	28	84.85	5	15.15	0	0	
Food Preparation	Dependent	47	30.92	63	41.45	42	27.63	p= 0.000 $\chi^2=34.74$
	Independent	38	79.17	6	12.5	4	8.33	
Housekeeping	Dependent	4	22.22	7	38.89	7	38.89	p= 0.123 $\chi^2=4.19$
	Independent	81	44.51	62	34.07	39	21.43	
Laundry	Dependent	10	14.49	27	39.13	32	46.38	p= 0.000 $\chi^2=45.12$
	Independent	75	57.25	42	32.06	14	10.69	
Transportation	Dependent	8	10.67	32	42.67	35	46.67	p= 0.000 $\chi^2=60.15$
	Independent	77	61.6	37	29.6	11	8.8	
Medicine Responsibility	Dependent	40	34.48	41	35.34	35	30.17	p= 0.005 $\chi^2=10.41$
	Independent	45	53.57	28	33.33	11	13.1	
Handling Finance	Dependent	6	17.65	9	26.47	19	55.88	p= 0.000 $\chi^2=25.97$
	Independent	79	47.59	60	36.14	27	16.27	
Activities Of Daily Living		n	%	n	%	n	%	
Bathing	Dependent	5	15.15	15	45.45	13	39.39	p= 0.002 $\chi^2=12.94$
	Independent	80	47.9	54	32.34	33	19.76	
Dressing	Dependent	57	34.13	64	38.32	46	27.54	p= 0.000 $\chi^2=30.05$
	Independent	28	84.85	5	15.15	0	0	
Toileting	Dependent	47	30.92	63	41.45	42	27.63	p= 0.000 $\chi^2=34.74$
	Independent	38	79.17	6	12.5	4	8.33	
Transferring	Dependent	4	22.22	7	38.89	7	38.89	p= 0.123 $\chi^2=4.19$
	Independent	81	44.51	62	34.07	39	21.43	
Continance	Dependent	10	14.49	27	39.13	32	46.38	p= 0.000 $\chi^2=45.12$
	Independent	75	57.25	42	32.06	14	10.69	
Feeding	Dependent	8	10.67	32	42.67	35	46.67	p= 0.000 $\chi^2=60.15$
	Independent	77	61.6	37	29.6	11	8.8	

participants



Discussion

This study presents the inter relationship between nutritional status and functional capacity in elderly females. With increasing geriatric population, it is important to understand the mechanism between this inter relationship and to provide nutritionally adequate interventions when required. Reduced appetite, fatigue, pain and early satiety can reduce food intake [7] which in turn can retrograde the nutritional status. Adequate interventions can help in improving quality of life and reducing mortality [7].

This study shows that nutritionally adequate individuals were more functionally independent whereas malnourished individuals and individuals at risk of malnourishment were more functionally dependent. MNA was used for classification of nutritional status having adequate specificity and sensitivity. Factors such as low food intake, weight loss, declined mobility, illness, neuropsychological problems were investigated. Insufficient food intake promotes malnutrition while physical and psychological limitations prevent insufficient food intake,

Functional capacity influences the quality and quantity of food consumed. Highest functional dependence was associated with shopping. Being unable to shop not only reduces the amount of food consumed but also the diversity of food. It is shown that malnutrition compromises functional capacity and also functional dependence at the same time also affects the nutritional status negatively.

Conclusion

A relationship of interdependence between nutritional status and functional capacity decline was found among female elderly. Functional dependence for IADL was found among more than half of elderly which may lead to poor quality of life. Hence it is important to diagnose such individuals at an early stage followed by nutritionally adequate interventions. Adequate national and international health programs should be developed for the elderly which limits their progression to malnourishment and functional dependence.

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