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Original Research Article

Assessment of nutritional and functional status of elderly in an urban community, Imphal West: a cross-sectional study

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ABSTRACT

Background: Nutrition affects the functional capability of the elderly population and functional status is a key indicator of geriatric health. Study was conducted to explore knowledge regarding the nutritional and functional ability status of elderly at the community level in the urban areas of Manipur.
Methods: A cross-sectional study was done among 210 elderly at an urban area. MNA and Katz index of ADL was used for assessing nutritional and functional status of the elderly. Purposive sampling was employed for data collection. Chi-square test and Pearson correlation test was used taking $p<0.05$ to be statistically significant.
Results: Mean score of MNA was 23.28±3.66 and for Katz index was 5.85±0.71. For nutritional status, half of the participants (105, 50%) were normal, almost half of them (95, 45.2 %) were at risk of malnutrition and a very few (10, 4.8%) were malnourished. For functional status, 4 (1.9%) were highly dependent, 10 (4.9%) were moderately dependent and 196 (93.3%) were highly independent. Marital status and co-morbid conditions were statistically associated with nutritional status ($p=0.07$) and Katz index score for ADL was negatively correlated ($r=-0.16$; $p=0.02$) with age of the participants.
Conclusions: The prevalence of risk of malnutrition was moderate and a very few of the participants were having highly dependent functional status.

Keywords: ADL, Geriatrics, Katz-index, Mini-nutritional assessment

INTRODUCTION

Aging is a natural process. The United Nations consider old age to be 60 years or older. According to the United Nations, it is estimated that in 2025 the population aged 60 years or older will be 1.2 billion and 2 billion in 2050 (representing about 22% of the world population).

As India undergoes demographic transition, there are nearly 104 million elderly persons according to 2011 census accounting for 8.1% of total population.[1] Elderly populations are at risk of under nutrition and can lead to frailty which contributes to progressive decline in health, reduced physical and cognitive functional status, complicated hospitalization outcomes, morbidity and mortality.[2,3] Nutritional status in turn affects the functional and it is a key indicator of geriatric health and any decline in the functional activity of elderly person could have widespread ramifications on their health outcomes.[4]

Though much emphasis has been paid on nutritional interventional programs in India for children, pregnant and lactating mothers, targeted and tailored intervention towards nutrition of the elderly seems to be neglected.[5] This present study was carried out to fill the knowledge gap regarding the nutritional status and functional ability of elderly populations living in an urban area and to

determine the risk factors of nutritional status and functional status and their associations.

METHODS

Study design

The study was a community-based cross-sectional study.

Study place

The study was conducted at field-practice area of Shija Academy of Health Sciences, Urban Health Training Centre, Singjamei.

Study duration

The study was conducted from 26th December 2023–31st January 2024.

Study population

The study was conducted among elderly patients living at Singjamei.

Inclusion criteria

Those who gave consent. Those aged more than or equal to 60 years of age.

Exclusion criteria

Those who could not be contacted on the day of visit. Respondents who were mentally incompetent or unable to complete the evaluation

Sample size and sampling method

Taking 15% prevalence of malnutrition, 6% absolute allowable error at 95% Confidence level, calculated sample size is 142.[6] Considering a design effect of 1.2 and non-response rate of 20%, final calculated sample size rounded off to 205. Convenience sampling method was used to identify the participant per household. If two or more eligible participants are identified in a single household, then lottery method will be used to enroll a single participant

Study tool

A pre–designed structured interview schedule was used for data collection which consists of two sections, namely socio-demographic characteristics and Mini nutritional assessment tool (MNA).

MNA tool is a well-validated questionnaire designed by the Nestle Nutrition Institute in Lausanne (Switzerland) for elderly people which comprises of 18 questions based on four domains, (a) Anthropometric measurements, (b) Dietary assessment, (c) Global health and social assessment, (d) Subjective assessment of health and nutrition.[14,15] Four anthropometric measurements- weight, height, mid upper arm circumference (MUAC) and calf circumference will be taken by the surveyors.

The respondents' body weight will be measured using a digital weighing scale to the nearest 0.1 kg and their height will be measured using a stadiometer and mid upper arm circumference (MUAC) and calf circumference were measured to the nearest 0.1 cm using a non-stretchable measuring tape.

Katz index will be used to assess activities of daily living as functional status.

Operational definitions

According to the score obtained using MNA tool, nutritional status was categorized as, Normal nutritional status (24 - 30 points). At risk of malnutrition (17 - 23.5 points). Malnourished (<17 points).

Smoking habit was categorized into three groups. Never smoker, current smoker (smoking for at least a year) former smoker (quit over one year ago).

Alcohol consumption was defined as never, Infrequent (consumed once in a month), frequent (who consumed once or more in a week).

Tobacco consumption as, never, Former (stopped for the past one year), Current (currently consuming tobacco).

For Katz Index, total score of 6 indicates full function. Score of 3–5 indicates moderate impairment. Score of 2 or less indicates severe functional impairment.[16]

Study variables

Independent variables included socio-demographic profile, financial dependence, previous occupation, co-morbid conditions and history of substance abuse was used.

Dependent variables were nutritional status and functional status.

Data collection

A total 3 teams of investigators were deployed for data collection. Each team composed of interns posted at Department of Community Medicine department supervised by a Junior resident Doctor.

Then the 3 teams headed out towards the North, East and South direction of Urban Health training Centre, Singjamei. Data were collected from eligible individual from each household until the sample size was reached.

Statistical analysis

The collected data was first entered in MS Excel and check for data consistency and correctness and later transferred to SPSS v25 (IBM, Armonk, NY) for analysis. Descriptive statistics such as Mean, Median, Standard Deviation was used.

For inferential statistics, parametric test such as Pearson correlation was used and non-parametric test such as chi-square was used. P value of less than 0.05 was taken to be statistically significant.

Ethical consideration

Ethical clearance was sought from the Institutional Ethics Committee (IEC), Shija Hospitals and Research Institute Pvt. Ltd., Langol. Verbal consent was taken from the participants. No personal identifiers were used during the data collection. Privacy and Confidentiality was maintained and the data was kept under lock and key at the Department of Community Medicine, SAHS.

RESULTS

Participants' background

The mean age of participants was 70.7±7.4 years. Out of the total 210 participants, females constitute more than half (135, 64.6%). Hinduism and Sanamahism constituted the religion in the population where majority was Hinduism (183, 87%).

A little more than half of the participants were found to be in currently married status (135, 64.3%). Almost half of the participants were found to have educational qualification of graduate and above (101, 48.1%). More than one-third of the participants were unemployed (80, 38.1%) (Table 1).

Very few (6, 2.9%) of the elderly were not found to be staying with the family. More than half (112, 53.3%) of the elderly were financially dependent. Out of the total 210, two-third (149, 71%) of them were found to have history with co-morbidity (Table 1).

More than two-third (168, 80%) of the participants responded that they never consumed alcohol (Figure 1). Out of the total participants, more than three-fourth (178, 84.8%) of them had never smoked. Only a few of the participants (32, 15.2%) were current tobacco users (Figure 2).

Nutritional status of the participants

Based on the MNA score, our study found out that almost half of the participants (95, 45.2%) were at risk of malnutrition and a very few (10, 4.8%) were malnourished. The mean score of malnutrition based on our study was 23.28±3.66 (Table 2).

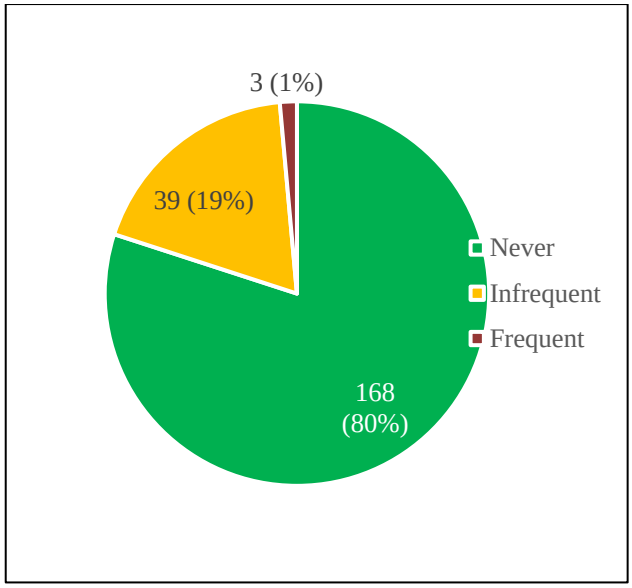

Figure 1: Participants' response to alcohol consumption.

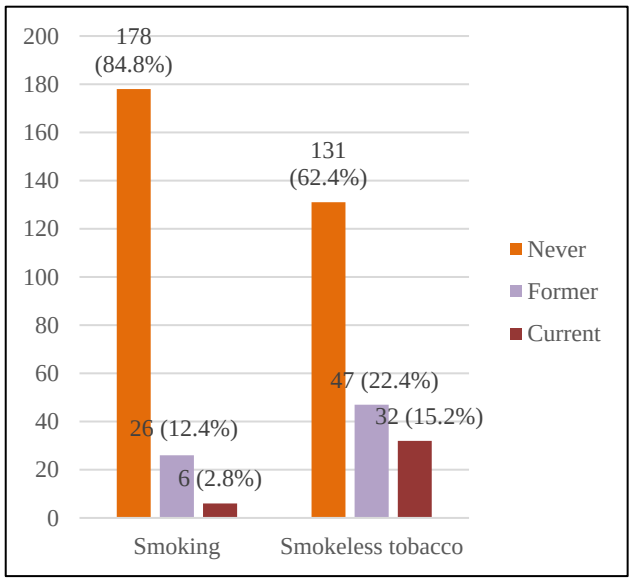

Figure 2: Participants' response to tobacco consumption.

Functional status of participants

Based on Katz Index Score for Activities of Daily Living, our study revealed that the mean score was 5.85±0.71. Majority of the participants were having Highly Independent functional status (196, 93.3%) and only a few (4, 1.9%) were in Highly dependent functional status.

Risk factors for nutritional status and functional status of participants

Bivariate analysis revealed that nutritional status was associated with marital status (p=0.007) and history of co-morbidity (p=0.002) of the participants and it is found to

be statistically significant. (Table 4) Increase in age was moderately correlated (r=-0.34) with decrease in nutritional score of participants and was found to be statistically significant (p=0.001).

No association was found between the functional status with any of the selected variables during bivariate analysis (Table 5). However, increase in age was weakly correlated (r=-0.16) with decreased functional status score given by Katz Index and was found to be statistically significant (p=0.02).

Association between the nutritional and functional status of participants

In this study, there was an association between the nutritional and functional status of the participants and it was statistically significant. (p=0.001) (Table 6).

Table 1: Participants' background.

Characteristics	N	%
Gender		
Male	75	35.7
Female	135	64.3
Religion		
Hindu	183	87.1
Sanamahism	27	12.9
Marital Status		
Single	8	3.8
Married	135	64.3
Divorced	4	1.9
Widow	52	24.8
Widower	11	5.2
Education level		
Graduate and above	101	48.1
12th passed	20	9.5
10th passed	36	17.1
8th passed	14	6.7
No formal education	39	18.6
Occupation (previously)		
Government	78	37.1
Private	14	6.7
Self-employed	38	18.1
Unemployed	80	38.1
Currently staying with family		
Yes	204	97.1
No	6	2.9
Financial dependence		
Yes	112	53.3
No	98	46.7
History of co-morbidity		
Yes	149	71.0
No	61	29.0

Table 2: Nutritional status of participants (n=210).

Nutritional status	N	%
Normal	105	50
Risk of Malnutrition	95	45.2
Malnutrition	10	4.8
Total	210	100

Table 3: Functional status of participants (n=210).

Functional status	N	%
Highly dependent	4	1.9
Moderately dependent	10	4.8
Highly Independent	196	93.3
Total	210	100

Table 4: Association between nutritional status and variables.

Variables		Malnourished	At risk	Normal	X^2	P value
Gender	Male	2	31	42	2.3	0.31
	Female	8	64	63		
Education	Graduate and above	3	37	61	12.36	0.13
	12 pass	1	10	9		
	10 pass	0	16	20		
	8 pass	1	7	6		
	No Formal education	5	25	9		
Marital Status	Single	0	3	5	21.08	0.007*
	Married	3	59	73		
	Divorced	1	2	1		
	Widow	5	24	23		
	Widower	1	7	3		
Staying with family	Yes	10	91	103	1.26	0.53
	No	0	4	2		
Financial dependence	Yes	7	56	49	4.19	0.12
	No	3	39	56		
Co-morbid history	Yes	7	79	63	12.98	0.002*
	No	3	16	42		
Smoking status	Never	7	78	93	4.25	0.37
	Former	2	14	10		
	Current	1	3	2		
Smokeless tobacco use status	Never	6	60	64	4.29	0.36
	Former	3	24	20		
	Current	1	10	21		
Alcohol use status	Never	9	77	82	1.12	0.89
	Infrequent	1	17	21		
	Frequent	0	1	2		

*p<0.05; statistically significant

Table 5: Association between functional status and variables.

Variables		Highly dependent	Moderately dependent	Highly independent	X^2	P value
Gender	Male	1	4	70	0.28	0.86
	Female	3	6	126		
Education	Graduate and above	1	5	95	4.97	0.76
	12 pass	1	1	18		
	10 pass	1	1	34		
	8 pass	1	1	12		
	No Formal education	0	2	37		
Marital Status	Single	0	1	7	8.73	0.36
	Married	3	7	125		
	Divorced	0	0	4		
	Widow	1	0	51		
	Widower	0	2	9		

Continued.

Variables		Highly dependent	Moderately dependent	Highly independent	X^2	P value
Staying with family	Yes	4	10	190	0.44	0.8
	No	0	0	6		
Financial dependence	Yes	1	6	105	1.47	0.47
	No	3	4	91		
Co-morbid history	Yes	3	8	138	0.45	0.79
	No	1	2	58		
Smoking status	Never	4	7	167	3.88	0.42
	Former	0	3	23		
	Current	0	0	6		
Smokeless tobacco use status	Never	4	4	122	4.91	0.29
	Former	0	3	44		
	Current	0	3	29		
Alcohol use status	Never	4	6	158	4.19	0.38
	Infrequent	0	4	35		
	Frequent	0	0	3		

Table 6: Association between nutritional status and functional status.

		Malnourished	At risk	Normal	X^2	P value
Functional status	Highly dependent	2	1	1	25.06	0.001*
	Moderately dependent	2	5	3		
	Highly independent	6	89	101		

*p<0.05; statistically significant

DISCUSSION

Nutrition is a vital factor that contributes to health and functional ability of an individual. This is much more significance in elderly as they become frail with ageing.

In our study, risk of malnutrition prevalence was 45% and a prevalence of 4.8% for malnutrition. Study done by Yadav et al, at a rural field practice, Jhalawar, Rajasthan has shown higher prevalence of malnutrition (25.4%) and lower prevalence (41.4%) of at risk of malnutrition.[1] Study by Shanbhag et al, in Rural area of South India also showed higher prevalence of malnutrition (60%) than our study.[7] Our study found out that the prevalence of highly dependent elderly was 1.9% and those of moderately dependent were 4.8%. Higher rates were observed in studies done by Shanbhag et al and Reza et al.[7,17] The difference in the prevalence can be attributed to differences in socio-demographic profile in study settings.

For malnutrition, our study has revealed that marital status and comorbidity were found to be associated statistically significant. Similar findings were also observed in various studies done by Yadav et al and Oinam et al.[1,6] Nutritional inadequacy in the elderly can be the result of one or more factors–physiologic, pathologic, sociologic and psychologic.

Our study had a few limitations. The self-reported answers might have led to over-reporting or under reporting alcohol, smoking status etc. No biochemical parameters of nutritional status assessment were done because of constraints of resources.

CONCLUSION

The overall prevalence of malnutrition and at risk of malnutrition in our study was 45% and 4.8%. The prevalence of highly dependent elderly was 1.9% and those of moderately were 4.8%. Approaches to improve nutritional status of the elderly should focus primarily to widow, widower and those with co-morbid conditions through available social schemes or programmes. Targeted interventions such as modification of the environment and surrounding to make it safer for the elderly to minimize accidents and to minimize dependence for daily necessary activities.

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Ethical approval: Not required

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