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Research Article

Functional dependence among elderly people in a rural community of Andhra Pradesh, South India

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ABSTRACT

Background: The elderly people constitute about 8% of the world's population. Loss of functional capacity of an elderly person leads to dependence on others and increased need for formal and informal care. The objectives of this study were to find out the prevalence of functional dependence among the elderly people and its association with certain socio-demographic factors.
Methods: A cross-sectional study was conducted from November 2013 to October 2014 in a rural area of Andhra Pradesh, South India. A Sample of 252 elderly individuals, aged 60 years and above were selected from the villages by probability sampling method and interviewed by using structured questionnaire. Activities of daily living (ADL) were assessed by Katz Index scale and Instrumental activities of daily living (IADL) were assessed by using Lawton Scale. Regression analysis was used to find the association between functional dependence and determinants.
Results: The prevalence of functional dependence was found to be 21.8% for ADL and 57.1% for IADL. The highest percentage of dependence for ADL was related to urinary continence/evacuation (12.7%), followed by getting bath (7.5%). Regarding the IADL, the highest percentage of dependence was related to managing money (44.8%) followed by preparation of meals (32.5%). After adjusting independent variables, functional dependence was found to increase with increasing age, lower education and lower Socio-Economic status.
Conclusions: More than half of the elderly were functionally dependent. National health programs for the elderly and voluntary organizations should take effort to identify and limit the progression of functional dependence and provide adequate care.

Keywords: Functional dependence, Elderly, ADL, IADL, Questionnaire

INTRODUCTION

The 20th century experienced the world's largest increase in the life expectancy in the history of mankind.[1] The developing countries were expected to experience more aging populations than developed countries.[2] In 2010, about 8% of world population was aged 65 years or older; by 2050, the number is expected to increase and constituting around 16%.[3] In India, the elderly aged 60years or older, is expected to increase from 8% in 2010 to 19% in 2050.[4]

The ageing process leads to decrease in body stamina and immunity and makes the elderly more prone to diseases and dependence.[5] Particularly the loss of functional capacity is associated with increased functional dependence, and increased need for care.[2]

Functional status is assessed by two types of activities. Activities of Daily Living (ADL) are also known as personal care activities or self-care activities which are bathing, dressing, feeding, etc. Instrumental Activities of Daily Living (IADL) are also known as activities for maintaining the environment or mobility skills which are shopping, keeping the house tidy, taking medications, etc.[7]

Only a few studies were conducted on functional dependence among the elderly in South India. The present study was done with the objective of finding out the prevalence of functional dependence among the elderly people and its association with certain social-demographic factor.

METHODS

Study design, study period, study area, and study population

A cross-sectional study was conducted from November 2013 to October 2014 in the rural areas of Venkatagiri Kota mandal, Chittoor district, Andhra Pradesh, South India among elderly people aged 60 years and above.

A sample size of 252 was calculated based on the prevalence of functional dependence among elderly as 26.8%, with a precision of 8% and an alpha level at 5%.[7]

The population of every village in Venkatagiri Kota Mandal of Chittoor district was noted and the number of elderly people aged 60 years and above (8%) in each village was calculated based on 2011 India census data.[6] There are 20 villages catered by the rural health centre. Each village was considered as a cluster. Based on probability proportional to size (PPS) sampling method 12 clusters were selected, and from these clusters 252 elderly individuals were selected at random and interviewed. All elderly people present at the time of study were included. The elderly persons who were not willing to participate, and who were not able to understand and also not able to speak were excluded from the study.

Data collection tool was a structured questionnaire. Activities of daily living (ADL) was assessed by Katz Index, and Instrumental Activities of Daily Living (IADL) was assessed by using Lawton Scale.[8,9]

While administering IADL, if participant does not perform routinely a particular activity like housekeeping/cooking, then the participants' response was considered based on whether he/she can perform that activity, if he/she was supposed to do it. The questionnaire was modified to suit the present study settings. Ethical approval was obtained from Institutional Ethics committee; and written informed consent was taken from the participants.

Data was analysed by using SPSS software version 21. All the socio-demographic variables were represented by Mean±SD (standard deviation) or percentages. The association between dependent variables (ADL, IADL) and independent variables was analysed by using bivariate analysis. Unadjusted odds ratio was calculated, and P Value ≤ 0.05 was considered as significant. All the independent variables with P Value <0.10 from the bivariate analysis were included in the multivariate logistic regression analysis. The step wise forward method was used to select independent variables for multivariate model. All the independent variables were retained in the final model. The odds ratio was calculated after adjusting for possible confounding variables and P Value ≤ 0.05 was considered as significant.

RESULTS

A total of 252 elderly subjects were studied. There were 97 (38.5%) males and 155 (61.5%) females. Majority (35.7%) of them were in 60-64 years of age. Mean age of the study subjects was 67.7±7.3 years. Most (76.6) of them were illiterates and 15.1% had primary school education only. Lower Socio-Economic status, i.e., class 4 and class 5 together constitute 71.8% of subjects, according to modified BG Prasad classification for the year 2013 (Table 1).

Table 1: Socio-demographic characteristics of the surveyed elderly individuals.

Variable	N(%)
Age groups	
60-64 years	90 (35.7)
65-69 years	59 (23.4)
70-74 years	60 (23.8)
>75 years	43 (17.1)
Gender	
Males	97 (38.5)
Females	155 (61.5)
Education	
Illiterates/No formal education	193 (76.6)
Primary (1st to 6th class)	38 (15.1)
Secondary (7th to 10th class)	17 (6.7)
Intermediate/Diploma	4 (1.6)
Socio-economic status	
Class 1	17 (6.7)
Class 2	35 (14)
Class 3	19 (7.5)
Class 4	114 (45.2)
Class 5	67 (26.6)
Total	252 (100)

Table 2: Level of functional dependence for basic activities of daily living (ADL) and instrumental activities of daily living (IDAL) of the surveyed elderly individuals.

Activity	Number of independent individuals for an activity	Number of partially dependent individuals for an activity	Number of completely dependent individuals for an activity
	N (%)	N (%)	N (%)
Basic activities			
Having a bath	223 (88.4)	15 (6)	14 (5.6)
Getting dressed	228 (90.5)	13 (5.1)	11 (4.4)
Going to the toilet	236 (93.7)	13 (5.1)	3 (1.2)
Moving in and out of bed/chair	236 (93.7)	13 (5.1)	3 (1.2)
Control of urination/evacuation	220 (87.3)	25 (9.9)	7 (2.8)
Feeding	238 (94.4)	12 (4.8)	2 (0.8)
Instrumental activities			
Using means of transportation	174 (69)	67 (26.6)	11 (4.4)
Shopping	176 (69.9)	58 (23)	18 (7.1)
Preparation of meals	170 (67.5)	51 (20.2)	31 (12.3)
Keeping the house tidy	183 (72.6)	37 (14.7)	32 (12.7)
Washing clothes	179 (71)	34 (13.5)	39 (15.5)
Managing the money	139 (55.2)	63 (25)	50 (19.8)
Taking medications	177 (70.2)	54 (21.4)	21 (8.4)

Table 3: Association between different variables and functional dependence for Basic activities of daily living (ADL) of the surveyed elderly individuals.

Variables	Unadjusted OR (95% CI)	P Value	Adjusted OR(95% CI)	P value
Age groups				
60-64 years	1	-	1	-
65-69 years	1.75 (0.25, 3.75)	0.082	1.83 (0.17, 3.83)	0.063
70-74 years	1.99 (0.01, 3.99)	0.092	1.93 (1.07, 4.93)	0.071
≥ 75 years	2.32 (1.57, 3.07)	<0.001	2.38 (1.74, 3.02)	<0.001
Gender				
Males	1	-	1	-
Females	1.98 (1.09, 2.87)	<0.001	2.01 (1.53, 2.49)	<0.001
Living with/arrangements				
Husband/wife/their children	1	-	1	-
Alone	1.83 (0.17, 3.83)	0.063	1.98 (0.02, 3.98)	0.059
With relatives	1.91 (0.09, 2.91)	0.072	2.18 (0.42, 2.94)	0.075
Education				
Intermediate (11-12th class)/Diploma	1	-	1	-
Secondary (7th-10th class)	1.03 (0.97, 2.03)	0.056	1.24 (0.76, 4.24)	0.051
Primary (1st -6th class)	1.27 (0.73, 2.27)	0.061	1.38 (0.62, 3.38)	0.068
Illiterates/No formal education	1.90 (1.65, 2.15)	0.023	2.23 (1.51, 2.95)	<0.001
Socio-Economic status (SES)				
Class 1	1	-	1	-
Class 2	1.21 (0.85, 1.57)	0.081	1.35 (0.47, 2.23)	0.314
Class 3	1.78 (0.83, 2.76)	0.069	1.70 (0.79, 2.61)	0.097
Class 4	1.91 (1.33, 2.49)	0.042	1.82 (0.86, 2.78)	0.063
Class 5	2.79 (1.79, 3.79)	<0.001	2.82 (2.01, 3.62)	<0.001
Chronic illnesses				
Absent	1	-	1	-
Present	2.89 (2.09, 3.69)	<0.001	3.21 (2.99, 3.43)	<0.001

Table 4: Association between different variables and functional dependence for instrumental activities of daily living (IADL) of the surveyed elderly individuals.

Variables	Unadjusted OR (95% CI)	P Value	Adjusted OR (95% CI)	P value
Age groups				
60-64 years	1	-	1	-
65-69 years	1.20 (1.12, 1.28)	<0.001	0.68 (0.41, 0.95)	0.042
70-74 years	1.50 (1.20, 1.82)	0.021	1.32 (0.84, 1.84)	0.052
≥ 75 years	2.30 (2.21, 2.39)	<0.001	1.99 (1.34, 2.64)	<0.001
Gender				
Males	1		1	
Females	0.24 (0.96, 1.44)	0.587	0.21 (0.19, 1.11)	0.157
Living with/arrangements				
Husband/their children	1		1	-
Alone	1.03 (0.16, 1.9)	0.332	1.05 (0.45, 2.55)	0.055
With relatives	2.11 (1.11, 3.11)	0.038	1.83 (0.17, 2.43)	0.914
Education				
Intermediate(11-12th class)/Diploma	1	-	1	-
Secondary (7th-10th class)	1.03 (1.01, 1.05)	<0.001	1.07 (1.04, 1.10)	<0.001
Primary (1st -6th class)	1.17 (1.07, 1.27)	<0.001	1.48 (1.37, 1.59)	0.037
Illiterates/No formal education	2.01(1.28, 2.79)	<0.001	2.59 (2.01, 3.17)	<0.001
Socio-Economic status				
Class 1	1	-	1	-
Class 2	1.87 (0.88, 2.86)	0.237	1.93 (0.92, 2.94)	0.083
Class 3	1.92 (0.92, 2.92)	0.062	2.02 (1.77, 2.27)	<0.001
Class 4	2.08 (1.53, 2.63)	<0.001	2.09 (1.76, 2.42)	<0.001
Class 5	2.91 (2.36, 3.46)	<0.001	3.05 (2.09, 4.01)	<0.001
Chronic illnesses				
Absent	1	-	1	-
Present	2.12 (0.22,4.02)	0.83	2.02 (0.66,3.38)	0.715

Table 2 shows the level of functional dependence including partial dependence for each activity. Among the basic ADL activities, the highest percentage of dependence was in relation to urinary continence/evacuation (12.7%), followed by getting bath (11.6%), going to toilet (6.3%) and moving in/ out of chair/bed (6.3%). In IADL, the percentage of dependence was in relation to handling money (44.9%), followed by preparation of meals (32.5%), using means of transportation (31%) and doing shopping (30.1%). The overall prevalence of functional dependence for ADL was 21.8% (95% CI: 18.7, 24.9) and for IADL was 51.7% (95% CI: 46.9, 56.5).

Table 3 shows that, elderly with increasing age, female gender, living alone, illiterate, socio-economically poor and presence of chronic illness had higher odds for functional dependence in ADL and were statistically significant.

After adjusting the independent variables, the functional dependence for ADL increased with advancing age, lower level of education and lower SES. However, Class 4 SES was not significantly associated with functional dependence for ADL (P=0.063) after adjusting.

Table 4 depicts that, Elderly with increasing age, living alone, illiterate, socio-economically poor and presence of chronic illness had higher odds for functional dependence in IADL. After adjusting the independent variables, functional dependence for IADL increased with increasing age, low education and Socio Economic Status and was statistically significant (P≤0.05).

DISCUSSION

The present study quantified the functional dependence for each activity of ADL and IADL including partial limitation or dependence. The study found, the prevalence of functional dependence for ADL (21.8%) and IADL (51.7%) and their association with certain socio-demographic factors.

The present study showed lesser prevalence of ADL dependence (21.8%) compared to similar studies conducted in India and other places; West Bengal (39.2%) and Haryana (37.4%), Southern Brazil (26.8%),

Santiago (34.7%), Buenos Aires (32.1%), Bridgetown (16.9%) and Montevideo (23.5%).[7,10,12]

In the present study, the prevalence of functional dependence for IADL was 51.8%. One similar study in West Bengal in India, showed a higher prevalence (83.9%).[10] However studies conducted in places outside India showed lower prevalence; Malaysia(33.5%), Southern Brazil (28.8%), Sao Paulo (33.8%), Santiago (30.3%), Montevideo (12.0%) and Bridgetown (18.1%).[7,12,13]

Regarding ADL, the highest percentage of dependence was in relation to urinary continence/evacuation, followed by getting bath. These findings were similar to the study conducted in West Bengal, in which highest percentage of dependence was with the control of urination (72.7%), evacuation (50%) followed by getting bath (50%); and in Southern Brazil, the highest percentage of ADL dependence was with control of urination/evacuation (21.3%) followed by getting dressed (9.9%).[7,10]

Regarding IADL, the highest percentage of dependence was in relation to handling money, followed by preparation of meals. These findings were similar to a study conducted in West Bengal, where the highest percentage of dependence for IADL was with the handling finance (74.4%), followed by preparation of meals (65.9%).[10] In a similar study conducted in Southern Brazil[7] the highest functional dependence was with using means of transportation (17.6%), followed by shopping (16.1%).[7]

Regarding the risk factors, in the present study, higher age group, lower education, lower SES were significantly associated with functional dependence for both of ADL and IADL. Female gender, chronic illnesses was significantly associated with ADL and not with IADL. Living with/arrangements were not significantly associated with ADL or IADL. In other studies (Haryana, Southern Brazil, Sao Paulo), the female sex, high age groups, low education and chronic illnesses were significantly associated with functional disability for ADL.[7,11,12]

CONCLUSION

The study showed that, functional dependence for ADL/IADL was present among more than half of the elderly and this may lead to poor quality of life. The study quantified the functional dependence for each activity of ADL and IADL including partial dependence. So, it will be easy for the nurses, doctors at hospitals and for health workers in the community to identify the elderly persons at risk for functional dependence. National health programs for the elderly and voluntary organizations should take effort to identify and limit the progression of functional dependence among them by providing adequate care.

The present study ignored the life expectancy of people of different countries while comparing the results of different studies, which may be a limitation.

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