

STUDY ON MORBIDITIES AND FUNCTIONAL DISABILITIES OF ELDERLY IN RURAL AREA OF KOTTAYAMAnitha Bhaskar¹, Manjula V. D², Jose Joseph³**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: BACKGROUND: India is affected by population aging which increases chronic debilitating diseases. **AIMS:** To identify major morbidities, the extent and nature of functional disabilities among elderly and the level of dependency measured by activities of daily living (ADL). To study the association between selected variables and various disabilities. **MATERIALS AND METHODS:** A cross-sectional study was conducted among elderly of randomly selected two wards of Arpookkara panchayat of Kottayam, Kerala. A total of 488 elderly were interviewed and demographic details, disease history, personal history were collected. Physical examination, assessment of functional disabilities and assessment of dependency by Activities of Daily Living were done. **STATISTICAL ANALYSIS:** Done using SPSS 14.0 version. Chi-square test was used to find out significance. **RESULTS:** Of total 488, 70.1% was diseased. 32.4% having musculoskeletal diseases, 29.9 % Hypertension, 17.2% Diabetes, 12.3% Chronic Obstructive Pulmonary Disease (COPD) and 6.6% Coronary Artery Disease (CAD). Visual impairment was present among 49.8%, (Cataract among 28.9%, refractive error in 20.9%), hearing impairment in 23.4%, depression in 18%, cognitive impairment 18.9% and urinary incontinence in 5.3%. Dependency assessed by Daily Activities of Living, showed that 8.4% were partially/ totally dependent. While by Instrumental Activities of Daily Living (IADL) 8.2% were totally dependent and 25.4% partially dependent. **CONCLUSION:** 70.1% of the study sample has at least one disease. Most Common Morbidities were Musculoskeletal Diseases, Hypertension, Diabetes, Chronic obstructive pulmonary disease, Coronary artery disease. Functional disabilities prevalent were visual, hearing, cognitive impairment, depression. Dependency increases with age. Prevalence of dependency almost equal in both sexes.

KEYWORDS: Elderly, functional disability, Activities of daily living (ADL), morbidity, instrumental activities of daily living (IADL).

INTRODUCTION: "Population aging" is a global phenomenon in the 21st century.^[1] In developed countries it has evolved gradually. But in developing countries like India, it is more rapid because of rapid fertility decline and an increase in life expectancy.^[2] Aging of the population increases their risk of getting chronic debilitating diseases like hypertension, heart diseases cancer, diabetes, mental disorders and dementia.

They are also prone for disabilities. In Kerala along with high life expectancy, low death rate, migration of children the problem of elderly is more. Moreover studies about functional disabilities and dependency among elderly are few. Hence this study is planned to find the main morbidities of the population, extent and nature of functional disabilities and dependency due to that.

MATERIALS AND METHODS: A community based cross sectional study was conducted in Arpookkara panchayat. There were 12 wards in the panchayat, each with a population around 240-

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290. Sample size was calculated by taking the prevalence of locomotor disability as 17%^[3] and a precision of 3.4 and α error 5% for a finite population in Epi info. It came to be 415. In order to obtain this sample size two wards (6, 9) were randomly selected.

The number of elderly from the selected wards was collected from voters list. This came to be 510. Elderly who is not willing and too ill to respond were excluded. Finally data was collected from 488 elderly. After getting consent, using pre tested interview schedule data was collected on demographic variable, personal habits, disease history and treatment. General examination was done in all subjects. Near vision was assessed by near vision card held at 14" distance from the subject while wearing corrective lenses (whenever applicable) and checked whether the person is able to read or not for both eyes separately.

Cataract, corneal opacity and aphakia were also looked among the elderly. Hearing was checked by whispering into each ear separately from behind the head to avoid lip reading. Cognitive impairment is assessed by Mini Mental Status Examination questionnaire (MMSE). Maximum score was 30. A score up to 24 was taken as normal, 21-23 mild dementia, 10-20 moderate, <10 severe. Depression was assessed by The Geriatric Depression Scale (short form, GDS). There were 15 questions with yes or no answers which were given as bold. One point for each of these bolded answers. Score 0-5 normal and above 5 suggests depression. All study subjects were assessed for urinary incontinence by asking whether they lose urine and get wet.

Dependency was measured by Katz Activities of Daily Living (ADL) scale and Lawton Instrumental Activities of Daily Living (IADL) scale. In Katz ADL scale, six physical activities like bathing, eating, dressing, walking, toileting and transferring in and out of bed are taken. Performance of each activity independently was given a score of 2, with partial assistance a score of 1 and for total dependence 0 score was given. Maximum score was 12. A score of 6-11 is partial dependence and 0-5 is total dependence. In case of Lawton IADL scale four activities were taken like taking medicines, managing money, going to places farther than walking distances, shopping for men and cooking for female. Performance of each activity independently was given a score of 2, with partial assistance a score of 1 and for total dependence 0 score was given. Maximum score was 8. A score 4-7 is partial dependence and 0-3 is total dependence.

ETHICS: Study protocol was submitted to the Institutional Ethics Committee of government Medical College Kottayam and clearance was obtained. Willingness of the participants was ensured before study and written consent was obtained. Information collected regarding the personal profile was kept strictly confidential.

STATISTICS: Data was entered in MS excel analyzed using SPSS version 14.0 version. Results were expressed in percentages and means. Chi-square test was used to find out significance. Chi-square for trend was also used.

RESULTS: Mean age of the study subjects were 70 yrs. 260 (53.3%) of the study subjects were young old (60-69), 164 (33.6%) were old old (70-79) and 64 (13.1%) were in oldest old (80 & above) category. There were 210 (43%) males and 278 (57%) females among the subjects. In all categories females' outnumbered males, with highest proportion of females in the oldest old group 41 (64.1%).

Majority were Hindus 257 (52.7%), followed by Christian 220 (45%) and 11 (2.3%) Muslim.

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The description of other socio-demographic variables is given in table no.1. More than half of study subjects (269) have education up to primary level. Illiterate category was dominated by females 41(71.9%). Occupational status was assessed by looking into the jobs held previously. Majority of the unemployed were housewives 202(91%).

In the married category 190(58.3%) were males. Among the widowed, 139(91.4%) were females. Majority of subjects in young old category 203 (78.1%) were married while among the oldest old category 42 (65.6%) were widowed. Majority 427 (87.5%) living with children with or without spouse. More than half of the study subjects belonged to social class III 268 (54.9%).

342 (70.1%) of the study subjects have at least one chronic disease. Chronic non communicable disease (NCD) topped the main morbidities. Among NCD musculoskeletal disease was present among 158 (32.4%) of study subjects, followed by Hypertension 146 (29.9%), diabetes in 84 (17.2%), COPD in 60 (12.3%) and CAD in 32 (6.6%).

Among the total study subjects 127 (37.2%) males and 215(62.8%) females were having chronic disease and difference in proportion was statistically significant ($p=0.00009$). Musculoskeletal disease, hypertension and diabetes are more among females while COPD, CAD is more among males. When these morbidities are analyzed based on gender, musculoskeletal disease ($p=0.001$), hypertension ($p=0.001$) and COPD ($P=0.04$) were statistically significant. (Table no 2)

Among the functional disabilities visual impairment were present among 243 (49.8%) of the study subjects (cataract in 141(58.0%) and refractive error in 102 (41.9%), followed by hearing impairment 114 (23.4%), cognitive impairment 92(18.9%), depression 88 (18.0%) and urinary incontinence 26 (5.3%). (Table no 3). When functional disabilities were compared with age group using chi-square for trend, visual impairment ($p=0.001$), hearing impairment ($p=0.001$) and cognitive impairment ($p=0.001$) were found to be statistically significant.

Even though depression was present in 18% of the study subjects, the proportion was almost similar in all age groups. Urinary incontinence was more among young old 160 (61.5%). When functional disabilities were compared with gender, visual impairment was present among 89 (36.6%) males and 154 (63.4%) females and the difference in proportion was statistically significant ($p=0.004$).

The difference in proportion of hearing impairment between males 39 (34.2%) and females 75 (65.8%) was also statistically significant ($p=0.02$). 33 (35.9%) males and 59 (64.1%) females were having cognitive impairment but it was not statistically significant. Even though depression was more among females 53 (60.2%) than males 35 (39.8%) it was not significant. There was not much gender difference in urinary incontinence. (Table no4)

When dependency was assessed with ADL, 41 (8.4%) were totally/ partially dependent, and 447 (91.6%) were independent. (Table no 5) When dependency was compared with age group using chi-square for trend, it was found significant statistically ($p=0.001$). Of the study subjects 3 (7.3%) of males and 38 (92.7%) females were dependent. 14(8.9%) subjects with musculoskeletal diseases are dependent. 23 (9.5%) visually impaired subjects are dependent. 25 (21.9%) subjects with hearing impairment are dependent compared to 16 (4.3%) of normal hearing subjects.

The difference was significant statistically ($p=0.004$). 23 (25%) cognitive impaired subjects are dependent compared to 18 (4.5%) of subjects without cognitive impairment. The difference was statistically significant also ($p=0.001$). 15 (17.0%) subject with depression and 26 (6.5%) normal

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subjects were having dependency. The difference is found to be significant ($p=0.001$). 3 (11.5%) subjects with urinary incontinence have dependency.

Assessment of IADL showed that 40(9.2%) have total dependency, 124(25.4%) have partial dependency. (Table no 6). When IADL were compared with age group using chi-square for trend, it was found to be statistically significant ($p=0.001$).

Gender and dependency was also found to be significant statistically ($p=0.001$). 17 (10.8%) of subjects with musculoskeletal disease had total dependency and 38(24.1%) had partial dependency. When IADL and functional disabilities were compared using chi-square for trend, visual impairment ($p=0.001$), hearing impairment ($p=0.001$) and cognitive impairment (0.001) were found to be statistically significant.

DISCUSSION: The number of study subjects in oldest old group (13%) is less. This is similar to a developing country. In all categories females outnumbered males. This may due to the fact that women in Kerala have higher life expectancy than men and also state's sex ratio is favorable for women.

Half of the study subject had primary education and only 5% had education above high school. Literacy rate was 88.3%, which is comparable with literacy rate of Kottayam district according to 2001 census. As age increased in the study sample, there was increased number of widowed persons. Most of the study subjects were living with their children with or without spouse. More than half of the study subjects belonged to social class III.

Chronic non communicable diseases topped the list of morbidities. The pattern of detected morbidities and their gender distribution were very similar to various studies. [4] [5] [6] In the present study proportion of study subjects with musculoskeletal disease was 32.4%, hypertension 29.9%, diabetes 17.2% and COPD 12.3% which was in perfect agreement with results of Shraddha et al.[7]

Kajal S et al^[8] reported similar proportion in musculoskeletal disease and hypertension. Osteoarthritis ranked first among the musculoskeletal diseases

49.8% subjects had visual impairment. Similar result was obtained by Shraddha et al (51.7%). Most common cause of visual impairment was cataract followed by refractive error in the present study which corresponds to Prakash R et al and Mishra et al^[9] and Kajal et al But Purohit & Sharma et al^[10] and Agrawal et al^[11] reported a higher percentage.

Coming to hearing impairment this study finding is similar to Survey in rural population in Delhi ^[9] and Joshi et al. Cognitive impairment in the present study is agreeing with the result obtained by Robert L et al^[12] and V B Singh et al^[13] 18.03% of subjects had depression. Mitra ^[14] and Santhosh K Barman et al ^[15] reported similar finding but Prakash R et al reported a higher %.

In this study depression was more among young old (55.7%) than old old (34.1%) and oldest old (10.2%). Robert L et al reported that depression was more among young old (46% Vs 7%). Swarnalatha N et al ^[16] reported that depression was high among oldest old (54.3%). In this study depression was more among females (60.2%), which is in agreement with Robert L et al (33%) and Swarnalatha et al (56.5%).

Prakash R et al reported 42% of elderly had psychosocial problem. In the present study, among subjects with depression 17.0% have dependency while it was only 6.5% among subjects without depression. It was found to be significant statistically. This finding is similar to Swarnalatha et al.

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In this study presence of urinary incontinence was almost equally distributed among males and females. Similar finding was observed by Jadhav V S et al ^[17] but K Joshi et al reported that it was more among females. As age increases all domains of ADL limitation increases drastically. It is similar to the finding obtained by Birhana Gebreyohannis et al ^[18] and M C Dolai et al.^[19]

The present study showed females slightly more dependent than males but Birhana Gebreyohannis et al revealed that males are more dependent for ADL than females. Rivlin et al ^[20] showed all domains of ADL are generally more prevalent in women than men.

In case of IADL also dependency increases with increasing age. More over dependency of IADL is higher than ADLs because it is more of a skilled job. Finding is similar to MC Dolai et al and Birhana Gebreyohannis et al. Dependency in IADL is more in females than males which is similar to Birhana Gebreyohannis et al finding. 41(8.4%) of subjects are dependent in ADL and 164(33.6%) are dependent in IADL. The statistical significance obtained between IADL and gender was similar to study by Jose C Millan Calenti et al ^[21].

Association between depression and dependency was found to be significant in the present study, which is consistent with the results obtained by Swarnalatha et al.

CONCLUSION: Most Common Morbidities in elderly were Musculoskeletal Diseases, Hypertension, Diabetes, COPD and CAD. Prevalent Functional disabilities were visual, hearing, cognitive impairment and depression. Dependency assessed by ADL increases with age and almost equal in both sexes. IADL dependency also increases with age, and with female gender.

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Demographic variable		Number	Percentage (%)
Education:	Illiterate	57	11.7
	Primary	269	55.1
	Secondary	90	18.4
	High school	47	9.6
	Above high school	25	5.1
Occupation:	Unemployed	222	45.5
	Unskilled	153	31.4
	Semi-skilled/ skilled	33	6.8
	Clerical/shop owner	67	13.7
	Semi/ professional	13	2.7
Marital status:	Married	326	66.8
	Widowed	152	31.2
	Single	8	1.6
	Divorced	2	0.4
Living arrangement	With children with or without spouse	427	87.5
	With spouse	40	8.2
	Alone	11	2.3
	With relatives	10	2.0

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Socioeconomic status:	Social class II	170	34.8
	Social class III	268	54.9
	Social class IV	50	10.2

Table no. 1: Distribution of socio-demographic variable in the study subjects

		SEX		Total	Chi-square	
		Male	female			
disease	present	127(37.2)	215(62.8)	342(70.1)	8.87	0.002
	absent	83(56.8)	63(43.2)	146(29.9)		
Musculoskeletal diseases	present	48(30.4)	110(69.6)	158(32.4)	15.26	0.001
	absent	162(49.1)	168(50.9)	330(67.6)		
Hypertension	present	41(28.1)	105(71.9)	146(29.9)	18.99	0.001
	absent	169(49.4)	173(50.6)	342(70.1)		
Diabetes	present	30(35.7)	54(64.3)	84(17.2)	2.22	0.1365
	absent	180(44.6)	224(55.4)	404(82.8)		
COPD	present	33(55)	27(45)	60(12.3)	4.00	0.0455
	absent	177(41.4)	251(58.6)	428(87.7)		
CAD	present	17(53.1)	15(46.9)	32(6.6)	1.42	0.2329
	absent	193(42.3)	263(57.7)	456(93.4)		

Table no. 2: Distribution of morbidities among study subjects with gender

Functional disability		AGE			Total	Chi-square	P value
		Young old	Old old	Oldest old			
Visual impairment	YES	111(45.7)	103(42.4)	29(11.9)	243(49.8)	6.0088	0.04
	NO	149(60.8)	61(24.9)	35(14.3)	245(50.2)		
Hearing impairment	YES	21(18.4)	42(36.8)	51(44.3)	114(23.4)	145.7373	0.001
	NO	239(63.9)	122(32.6)	13(3.5)	374(76.6)		
Cognitive impairment	YES	10(10.9)	35(38.0)	47(51.1)	92(18.9)	139.9330	0.001
	NO	250(63.1)	129(32.6)	17(4.3)	396(81.1)		
Depression	YES	49(55.7)	30(34.1)	9(10.2)	88(18.1)	0.806	0.668
	NO	211(52.8)	134(33.5)	55(13.8)	400(81.9)		
Urinary incontinence	YES	16(61.5)	5(19.2)	5(19.2)	26(5.3)	2.824	0.244
	NO	244(52.8)	159(34.4)	59(12.8)	462(94.6)		

Table no. 3: Distribution of functional disabilities among study subjects in relation to age group

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81		Male		Female		TOTAL		Chi-square	P value
		no	%	no	%	no	%		
Visual impairment	YES	89	36.6	154	63.4	243	49.8	8.1055	0.004
	NO	121	49.4	124	50.6	245	50.2		
Hearing impairment	YES	39	34.2	75	65.8	114	23.4	4.723	0.02
	NO	171	45.7	203	54.3	374	76.6		
Cognitive impairment	YES	33	35.9	59	64.1	92	18.9	1.7075	0.1913
	NO	177	44.7	219	55.3	396	81.1		
depression	YES	35	39.8	53	60.2	88	18.1	0.465	0.495
	NO	175	43.8	225	56.3	400	81.9		
Urinary incontinence	YES	11	42.3	15	57.7	26	5.3	0.006	0.939
	NO	199	43.1	263	56.9	462	94.6		

Table no. 4: Functional Disabilities of the study sample and Gender

		ADL			Chi-square	P value
		Total dependency	Partial dependency	Complete independency		
AGE	Young old	1(0.4)	7(2.7)	252(96.9)	42.844	0.001
	Old old	2(1.2)	11(6.7)	151(92.1)		
	Oldest old	4(6.3)	16(25.0)	44(68.8)		
SEX	Male	3(1.4)	12(5.7)	195(92.9)	0.76	0.3836
	Female	4(1.4)	22(7.9)	252(90.6)		
Musculoskeletal disease	YES	2(1.3)	12(7.6)	144(91.1)	0.06	0.800
	NO	5(1.5)	22(9.1)	303(91.8)		
Visual impairment	YES	2(0.8)	22(9.1)	219(90.5)	0.71	0.3990
	NO	5(2)	12(4.9)	228(92.7)		
Hearing impairment	YES	5(4.4)	20(17.5)	89(78.1)	8.04	0.0045
	NO	2(0.4)	14(3.8)	358(95.7)		
Cognitive impairment	YES	4(4.3)	18(19.6)	70(75)	40.59	0.001
	NO	3(0.8)	16(4.0)	377 (95.5)		
Depression	YES	5(5.7)	10(11.4)	73(82.95)	10.42	0.001
	NO	2(0.5)	24(6.0)	374(93.5)		
Urinary incontience	YES	2(7.7)	1(3.8)	23(88.5)	0.35	0.55
	NO	5(1.1)	33(7.1)	424(91.8)		

Table no. 5: Distribution of activities of daily living with other factors

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		IADL				Chi-square	P value
		Total dependency	Partial dependency	complete independency	total		
AGE	Young old	5(1.9)	37(14.2)	218(83.8)	260	139.7945	0.001
	Old old	12(7.3)	57(34.8)	95(57.9)	164		
	Oldest old	23(35.9)	30(46.9)	11(17.2)	64		
SEX	Male	13(6.2)	37(17.6)	160(76.2)	210	15.944	0.001
	Female	27(9.7)	87(31.3)	164(59.0)	278		
Musculoskeletal disease	YES	15(7.6)	43(27.2)	100(63.3)	158	1.1179	0.5718
	NO	25(7.6)	81(24.5)	224(67.9)	330		
Visual impairment	YES	27(11.1)	71(29.2)	145(59.7)	243	11.072	0.003
	NO	13(5.3)	53(21.6)	179(73.1)	245		
Hearing impairment	YES	27(23.7)	44(38.6)	43(37.7)	114	71.819	0.001
	NO	13(3.5)	80(21.4)	281(75.1)	374		
Cognitive impairment	YES	27(29.3)	27(29.3)	38(41.3)	92	62.89	0.001
	NO	18(4.5)	74(18.7)	304(76.8)	396		
Depression	YES	12(13.6)	20(22.7)	56(63.6)	88	3.12	0.210
	NO	33(8.3)	81(20.3)	288(72)	400		
Urinary incontinence	YES	3(11.5)	6(23.1)	17(65.4)	26	0.319	0.572
	NO	42(9.1)	95(20.6)	325(70.3)	462		

Table no. 6: Distribution of instrumental activities of daily living with other factors

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