PREVALENCE AND CORRELATES OF FUNCTIONAL LIMITATION AMONG ELDERLY IN KERALA

Dr. Anjana A

Dr. Asha T Chacko

Abstract

The number of people surviving into old age is increasing. The ageing scenario of Kerala is much prominent than in any other states of India. Longevity of people may be resulted in poor health status, disability and loss of functional health. Functional status is an individual's ability to perform normal daily activities required to meet basic needs, fulfill usual roles and maintain health and well-being. Functional status can be measured with Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL), which is a series of life functions necessary for maintaining a person's immediate environment. The aims of the present study are to distinguish the association between functional dependence and disability among elderly and to identify the various factors associated with the functional dependence of elderly. The study utilized the data from the survey, 'Building a Knowledge Base on population Ageing in India'. The elderly in the sample is grouped into three groups according to IADL scores. The lower score indicates greater difficulties in performing the IADL. The elderly were assessed on the different aspects of limitations and abilities to perform the IADL. Multinomial regression explains the amount of variance in IADL that can be explained by independent variables. The study indicated that elderly with some kinds of disability can do IADL by themselves, but it varies according to the type of disability and one fourth of elderly without disability have low IADL scores. It was found that marital status, living arrangements, socio-economic status and educational level of the elderly have strong bearings on the ability to perform the IADL. Problems with IADL could be closely related to subjective well being, sex and social support apart from economic variables and age. In the era of population ageing, accurate assessments of need for disability assistance are essential for effective planning of support services for the elderly.

The number of people surviving into old age is increasing. The growth of the elderly population is expected to escalate in the coming years with respect to the general population. Longevity of people may be resulted in poor health status, disability and loss of functional health. Information on disability is very important in responding to the care of the elderly.

Numerous studies have shown an association between aging and higher risks of functional dependence, as well as a high prevalence of functional disability or limited functional ability in the older adult population. Functional status is an individual's ability to perform normal daily activities required to meet basic needs, fulfill usual roles and maintain health and well-being. Loss of functional status is associated with increased risk of institutionalization and falls and, it was considered an independent risk factor for mortality (Dolai and Chakrabarty, 2013). As life expectancy and the proportion of older adults increase, disability becomes a crucial issue. According to most usual definitions, 20–25 percent of the population over age sixty-five in industrialized countries has some form of disability (Christopher et.al, 2013**).** The big challenge of disability tend to increase with increasing morbidity and vulnerability in advanced age to the extent that a portion of the elderly fails to undertake even basic and/or instrumental activities of daily living (Mohanti S et.al, 2012). If increased life expectancy is accompanied by decreased disability, the elderly can lead more autonomous lives, which will put fewer pressures on social systems and improve quality of life (Jacobzone S, 2000). Therefore, it is important to measure the prevalence of functional dependence according to the prevalence of disability among elderly. Functional status can be measured Instrumental Activities of Daily Living (IADL), which is a series of life functions necessary for maintaining a person's immediate environment. IADLs are not merely physical indicators of functioning but also indicate cognitive performance, such as managing financial transactions, taking medications, travelling alone and using the telephone. In this sense IADLs can be defined as activities required in order being involved in the community (Ostir et al. 1999). Some IADLs, like shopping, meal preparation and housework, also include an element of social roles, as performing them might be traditionally associated with gender.

Functional status can be influenced by biological or physiological and socio-economic factors which are multidimensional in nature. The well being and improved functional status of the elderly is intimately linked with their educational status because education enables greater adaptability to changing socio-economic conditions (Chadha et.al, 2006). An elderly person's

quality of life is the degree of well -being felt by the individual. Functional activity appears to contribute to the mental health of older adults through maintenance of a busy and active life, mental alertness, positive attitude toward life and avoidance of stress, negative function, and isolation (Stathi A et al, 2002).

Aging in Kerala

The ageing scenario of Kerala is much prominent than in any other states of India. Kerala has the largest proportion of elderly population and the growth rate among the aged is increasing higher and higher. High feminization among elderly is one peculiarity of aging in Kerala and the future projection says also about the increase in the proportion of female population. The study of functional dependence among elderly in Kerala is rare and the information on functional dependence is essential for planning health care facilities among elderly in Kerala.

Objectives

The aim of the present study are 1) to examine the demographic and socio-economic differentials of the functional dependence of elderly, 2) to distinguish the association between functional dependence and disability among elderly and 3) to assess the healthy life expectancy. The outcome of these assessments would focus into the measures that encouraging the abilities to perform any activities of daily living of elderly and care of elderly.

Data and Methodology

The study utilized the data collected from Kerala, as part of the survey 'Building a Knowledge Base on Population Ageing in India'. The survey was conducted in seven major states of the country, selected on the basis of speedier ageing and relatively higher proportions of the elderly in the population. The present study concentrates on the data on functional dependence and disability sections. Lawton and Brody IADL scale (1969) have been used to find the functional limitation. The IADLs involve a set of functioning abilities including the ability to use the telephone, go shopping, prepare meals, do housekeeping, do laundry, travel, take responsibility for one's own medication and ability to handle finances. In Kerala, IADL limitations are highest for doing shopping and preparation of meals. The elderly in the sample is grouped into three groups according to IADL scores. The lower score indicates greater difficulties in performing the

functional activities. The elderly were assessed on the different aspects of limitations and abilities to perform the IADL. Multinomial regression explains the amount of variance in IADL that can be explained by independent variables. Life Tables were constructed in order to find the healthy life expectancy free of disability and functional limitation.

Analysis

Table 1: Gender wise Ability to do Instrumental Activities of Daily Living

Instrumental Activities of Daily Living	Male	Female
Ability to use telephone	45.3	54.7
Shopping	57.2	42.8
Food Preparation	31.5	68.5
House keeping	38.1	61.9
Laundry	36.7	63.3
Transportation	45.2	54.8
Medication	43.6	56.4
Finance	45.6	54.4

While observing the activities assessed according to gender, functional health activities show that there exist gender differentials in a way that females are better off in doing activities than males. The proportion of males exceeds females only in the case of doing shopping. Table 1 shows the differences found among them and the wide difference observed in the activities of food preparation, housekeeping, and laundry which are mainly women oriented activities.

Table 2: Demographic and socio-economic differentials in the IADL

Variables		Instrumental Activities of Daily Living			
		Low	Medium	High	Total
Age	60-64	82(17.5)	149(31.8)	238(50.7)	469(100.0)
	65-74	153(27.7)	209(37.9)	190(34.4)	552(100.0)

	75+	209(60.8)	88(25.6)	47(13.7)	344(100.0)
Sex	male	186(32.8)	176(31.0)	205(36.2)	567(100.0)
	female	258(32.3)	270(33.8)	270(33.8)	798(100.0)
Residence	rural	239(34.6)	232(33.6)	219(31.7)	690(100.0)
	urban	205(30.4)	214(31.7)	256(37.9)	675(100.0)
Religion	Hindu	235(29.5)	275(34.5)	287(36.0)	797(100.0)
	Muslim	152(49.0)	84(27.1)	74(23.9)	310(100.0)
	Christian	57(22.4)	86(33.7)	112(43.9)	255(100.0)
caste	SC or ST	34(30.6)	40(36.0)	379(33.3)	111(100.0)
	OBC	291(38.0)	250(32.6)	225(29.4)	766(100.0)
	forward	117(24.2)	155(32.0)	212(43.8)	484(100.0)
Education	without formal edn or up to primary	283(46.4)	196(32.1)	131(21.5)	610(100.0)
	5-9'	105(27.8)	138(36.5)	135(35.7)	378(100.0)
	more than 9 years	56(14.9)	112(29.7)	209(55.4)	377(100.0)
Marital status	currently married	197(25.8)	251(32.9)	315(41.3)	763(100.0)
	others	247(41.0)	195(32.4)	160(26.6)	602(100.0)
Living status	living with spouse or alone	37(16.9)	81(37.0)	101(46.10)	219(100.0)
	living with others	407(35.5)	365(31.8)	374(32.6)	1146(100.0)
Wealth index	low	89(37.9)	83(35.3)	63(26.8)	235(100.0)
	medium	239(37.0)	213(33.0)	194(30.0)	646(100.0)
	high	116(24.0)	150(31.0)	218(45.0)	484(100.0)
Working status	Currently not working	416(35.6)	379(32.4)	374(32.0)	1169(100.0)
	working	28(14.3)	67(34.2)	101(51.5)	196(100.0)
Rating of health	bad	222(48.1)	126(27.3)	114(24.7)	462(100.0)
	good	222(24.6)	320(35.4)	361(40.0)	903(100.0)
Ailment	no	58(23.3)	92(36.9)	99(39.8)	249(100.0)
	yes	386(34.6)	354(31.7)	376(33.7)	1116(100.0)

Disability	Yes	381(33.9)	366(32.5)	378(33.6)	1125(100.0)
	No	63(26.3)	80(33.3)	97(40.4)	240(100.0)
	Total	444(32.5)	446(32.7)	475(34.8)	1365(100.0)

Functional disability computed as a sum score of restriction in participation in IADL was significantly associated with age. Many studies related to disability shown that limitations in instrumental activities of daily living may be influenced more by gender specific tasks. From Table 2 it is seen that the IADL scores decreased with advancing age. Gender wise differential in the functional dependence is very low. Urban elderly have slightly higher IADL scores than their rural counterparts. It can be observed that Christians have higher the IADL scores and Muslims have the least. Forward caste population have the higher scores of IADL compared to that of other castes. Educational attainment of elderly shows that there is a positive influence of education on their IADL scores. Currently married persons are having the lower risk of functional limitation when compared to the other categories of marital status. Similarly persons living with spouse or living alone have also lower risk of functional limitation. It is seen that the IADL scores increases with the increase of wealth index. Among the elderly who are not working, the proportion of those with lower IADL is higher compared to that of elderly who are working. Good rating of health increases the IADL scores like in the cases of presence of ailments and disability.

Table 3: Percentage Distribution of IADL Scores by Type of Disability

Disability		IADL Scores			
Vision		Low	Medium	High	Total
	Fully	21(75.0)	4(14.3)	3(10.7)	28(100.0)
	Partially	309(32.1)	314(32.6)	340(35.3)	963(100.0)
	No	114(30.5)	128(34.2)	132(35.3)	374(100.0)
Hearing	Fully	22(62.9)	8(22.9)	5(14.3)	35(100.0)
	Partially	123(55.7)	61(27.6)	37(16.7)	221(100.0)
	No	299(27.0)	377(34.0)	433(39.0)	1109(100.0)
Walking	Fully	28(71.8)	6(15.4)	5(12.8)	39(100.0)

	Partially	180(53.6)	96(28.6)	60(17.9)	336(100.0)
	No	236(23.8)	344(34.7)	410(41.4)	990(100.0)
Speaking	Fully	9(45.0)	8(40.0)	3(15.0)	20(100.0)
	Partially	41(80.4)	4(7.8)	6(11.8)	51(100.0)
	No	394(30.4)	434(33.5)	466(36.0)	1294(100.0)
Memory	Fully	5(45.5)	4(36.4)	2(18.2)	11(100.0)
	Partially	140(51.5)	69(25.4)	63(23.2)	272(100.0)
	No	299(27.6)	373(34.5)	410(37.9)	1082(100.0)
	Total	444(32.5)	446(32.7)	475(34.8)	1365(100.0)

The extent of functional disability in the sample shows that thirty three percent got low IADL scores while 33 percent had medium scores and 35 percent had high scores. Analysis showed that the prevalence of disability (full or partial) in Kerala varies from 72 per cent for vision to 45 per cent for speech. Most disabilities, except vision, seem to be higher among women than among men. The study indicated that elderly with some kinds of disability can do IADL by themselves, but it varies according to the type of disability and one fourth of elderly without disability have low IADL scores. The disability classification shows that elderly with partial disability in vision is more followed by partial disability in walking. Among elderly who have full disability in vision, 10.7% are with high functional activity scores while among persons with no disability in vision, one third are with low IADL scores. Three fourths of the elderly with full vision disability are seen with a high functional dependence. Great majority of the elderly are out of the disability problems with hearing. Among these, 27 per cent seek assistance in functional activities. Full or partial disability in hearing tends to have low IADL scores among elderly. It is seen that significantly higher proportion of elderly with full or partial disability in walking have low IADL which means a higher dependence on functional performance at the same time one fourth of elderly who have no disability in walking have also low IADL scores . Speaking disability is very low in the sample. Majority of the elderly with partial disability in speaking (80.4 per cent) are having low IADL scores while 15.0 per cent of elderly with full disability in speaking are having high IADL. About 20 per cent of elderly are suffering from

some kind of disability in memory. Among them majority is with low IADL scores. Elderly who are not affected disability in memory, about 28 per cent is with low IADL.

Table 4: Results of Multinomial Regression Analysis

Variables	Medium			High	
	B	Exp(B)		B	Exp(B)
Age** 60-64	1.401	4.058	Age** (60-64)	2.331	10.290
65-74	1.234	3.437	65-74	1.721	5.592
(>74)®			>74®		
Sex **male	-.645	.524	Sex **(male)	-.848	.428
(Female)®			(female)®		
Residence rural	.033	1.033	Residence(rural)	-.072	.930
(Urban)®			Urban®		
Religion Hindu	-.374	.688	Religion*(Hindu)	-.430	.651
Muslim**	-1.159	.314	Muslim**	-1.153	.316
(Christian)®			(Christian)®		
Caste (Sc or St)	.225	1.253	Caste (Sc or St)	.278	1.321
OBC	.122	1.129	OBC	-.078	.925
(Forward)®			(Forward)®		
Edn(Upto 5th class)*	-.536	.585	Edn (Upto 5th class)**	-1.432	.239
5-9	-.221	.801	5-9**	-.867	.420
>9®			>9®		
Marital status(currently married)	.185	1.203	Marital status (currently married)	.309	1.361
(others)®			(others)®		
Living status*(Living with spouse or alone	.823	2.277	Living status*(Living with spouse or alone	.767	2.154
Others®			Others®		
Wealth low	-.301	.740	Wealth low	-.442	.643
Medium	-.121	.886	Medium	-.188	.829

High®			High®		
Working status(not working)*	-.766	.465	Working status(not working)*	-1.208	.299
working®			working®		
Rating of health(bad)	-.765	.465	Rating of health(bad)*	-.779	.459
Good®			Good®		
Ailment(no)	.143	1.153	Ailment(no)	.109	1.116
Yes®			Yes®		

*significance level at 5%, ** significance level at 1%

From the results of the Multinomial regression, it is found that age of elderly, sex, religion, living arrangements, working status, educational level of the elderly and rating of health have strong bearings on the ability to perform the IADL. Elderly in the age group 60-64 are 4 times more likely to have medium IADL score than low IADL score when compared to the elderly in the age group of more than 74 years of age and it is 10 times more in the case to have high IADL scores. These researchers concluded that, physical functioning in terms of ADLS and IADL decline with age. It is seen that males have lesser chances of getting medium IADL score or high IADL score than females. When compared to Christians, Muslims are less likely to have high IADL scores than low IADL. Increase in the educational level reduces the risk of functional limitation. Elderly living with spouse or living alone are2 times each for medium IADL score and high IADL scores than the elderly who are living with the other members of the family when compared to the elderly with IADL scores. Elderly who are working presently are likely to have medium or high IADL scores than elderly with low IADL score likewise elderly who rate their health as good than that of bad rating.

Healthy Life Expectancy

In this study the healthy life expectancy of the elderly people was calculated. For this, in ordinary life table the prevalence rate of functional limitation and disability for the elderly people are combined to find healthy life expectancy.

Table 5: Healthy Life Expectancy (Free of Functional Limitation)

	Total			Male			Female		
Age	ex	He_x	Difference	Ex	He_x	Difference	ex	He_x	Difference
60-64	19.51	6.03	13.48	17.31	5.90	11.41	21.65	6.09	15.56
65-69	15.84	3.87	11.97	14.05	4.21	9.84	17.47	3.52	13.95
70-74	12.34	2.19	10.15	10.88	2.68	8.21	13.56	1.72	11.84
75-79	9.28	1,24	8.04	8.40	1.48	6.92	9.96	1.06	8.90
80-84	7.02	0.69	6.33	6.29	0.61	5.68	7.55	0.73	6.82
85+	4.93	0.38	4.55	4.42	0.21	4.21	5.28	0.47	4.81

It was found that the total life expectancy at the age 60 was 19.5 years and healthy life expectancy free of disability at the age 60 was 6.03 years. This means that an individual at the age 60 was expected to live nearly about 13 year in a state with functional limitation. For the higher age group it was found that almost all the remaining life are spending with functional limitation. Females are living with more functional limitation than their counterparts as their life expectancy is higher than males.

Table 6: Healthy Life Expectancy (Free of Disability)

	Total			Male			Female		
Age	ex	He_x	Difference	Ex	He_x	Difference	ex	He_x	Difference
60-64	19.51	3.02	16.49	17.31	2.75	14.56	21.65	3.29	18.36
65-69	15.84	1.85	13.99	14.05	1.66	12.36	17.47	2.04	15.43
70-74	12.34	1.07	11.26	10.88	0.84	10.04	13.56	1.26	12.29
75-79	9.28	0.68	8.61	8.40	0.51	7.89	9.96	0.80	9.17
80-84	7.02	0.24	6.78	6.29	0.31	5.98	7.55	0.19	7.36
85+	4.93	0.19	4.74	4.42	0.21	4.21	5.28	0.19	5.09

It was found that the total life expectancy at the age 60 was 19.5 years and healthy life expectancy free of disability at the age 60 was 3.02 years. This means that an individual at the age 60 was expected to live nearly about 16 year in a state with disability. For the higher age group it was found that almost all the remaining life are spending with some disability. Females are living more years with disability than their counterparts.

Discussion

It is revealed that, age was negatively and significantly affected total scores of functional ability which indicated that, as the age advances the person experiences decline in all the domains of functional ability. These results are in line with studies conducted by Sulander *et al.* (2003). Hays *et al.* (2001), Leon *et al*. (1996) and Dolai and Chakrabarty(2013). Increase in age of elderly contributes the deterioration in the physical as well as functional health. The present study shows the higher IADL scores among women than males which is indicative of the independence of females in doing functional activities. This finding is in agreement with that of Dolai and Chakrabarty (2013). Usually, elderly women have been more limited to domestic activities.The present sample consists of elderly women who are in a position to do their own activities in a fairly fit manner. Educational level of a person was found to have highly significant and positive relation with physical functioning and scores of functional ability (Badiger et.al 2010). The present results indicated that, as educational level increased the person's functional ability was better. Marital status could be associated with functional disability among the elderly. But in the present study, marital status could not gain importance in doing functional health activities among elderly which is a disagreement with the study of Millan J (2013). At the same time living arrangement of elderly exerts influence in doing IADL in such ways that elderly who are staying with their spouse or alone have a tendency to attain more IADL scores than who live with others. Generally physical health is worse among elderly people, but the present study finds any significant association of IADL scores with presence of ailment and self rated health. This was in contrast to the study that showed a consistent association between morbid conditions and disablement among the elderly (Pope et. al, 2001). In the study elderly even without any disability have shown functional limitation. One feature that emerged from the study was similar to the study by Bhawsar (2001) that men's life expectancy is uniformly lower than women's primarily due to the effect of the former's less healthy lifestyles during adulthood compared with the latter.

Conclusions

Performance of IADL could be closely related to biological variables such as age and sex. Since women outnumbered men among the sample population, it is hopeful to conclude that elderly women can be relished with functional independence, but in the advancement of their age, they have to suffer a lot. The results of the study showed that the extended life year is accompanied by increased demands on health care delivery systems as more part of life may be spent with some functional limitation. The prevalence of physical disability in elderly persons with functional limitation are, therefore, important for policy development on care of the elderly. The most effective way to reduce the proportion of population with disabilities is to delay the onset of disabilities. Living independently in familiar surroundings surely promotes a better ageing and the development of living environments together with functional ability exert a profound influence on active ageing. In Kerala situation, geriatric care should be focused to the necessities of elderly women since they have to live more years with functional limitation and disability than males.

Reference

Badiger M.S, R. Kamath and K.V. Ashalatha (2010), Correlates of functional ability among the elderly Karnataka, Journal of . Agricultural sciences.,23 (3) : (480-484)

Bhawsar Rahul Dev (2001), Population Ageing in India: Demographic and Health Dimensions in eds Ishwar Modi –"Ageing and Human Development Global Perspectives", Rawat Publications, Jaipur.

Chadha, N.K., Chao, D., Majumdar, P., Sharma, R., & Rohatgi, M. (2006). Determinants of the functional status of the older India. Interim Report of the Major Task Force submitted to ICMR.

Christopher J.L. Murray, and Alan D. Lopez, (2013), Measuring the Global Burden of Disease The New England Journal of Medicine; 369:448-457

Hays, J.C., Steffens, D.C., Flint, E.P. and George, L.K. (2001), Doessocial support buffer functional decline in elderly patients with unipolar depression?, American Journal of Psychiatry, 158:1850-1855.

Jacobzone Stephane (2000), CopingWith Aging:International Challenges, Health Affairs, Vol,19 (3).

Jose C. Millan-Calenti Javier Tubı´o A, Salvador Pita-Ferna´ndez B,(2010), Prevalence of functional disability in activities of daily living (ADL), instrumental activities of daily living (IADL) and associated factors, as predictors of morbidity and mortality, Archives of Gerontology and Geriatrics 50, 306–310

Lawton MP, Brody EM.(1969), Assessment of older people: Self-maintaining and instrumental activities of daily living. Gerontologist; 9:179-86.

Leon, C.M.F., Seeman, T.E., Baker, D.I., Richardson, E.D. and Tinetti, M.E. (1996), Self efficacy, physical decline, and change in functioning in community living elderly: A prospective study, J. Gerontology Social Sciences, 51B (4); S183-S190

Mohan Chandra Dolai and Falguni Chakrabarty (2013), Functional Status of the Elderly Santal People, International Journal of Humanities and Social Science Invention ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714 www.ijhssi.org Volume 2 Issue 1 ǁ January. 2013ǁ PP.01-06

Ostir GV, Carlson JE, Black SA, Rudkin L, Goodwin, JS, Markides KS,(1999), Disability In the Older Adults: prevalences, causes and consequences, Behaviural Medicine, 24, 147-156.

Pope SK, Sowers M, Welch GW,(2001), Functional limitations in women in midlife: the role of health conditions, behavioural and environmental factors. *Women's Health Issues*; *11* : 494-502.

Sandhyarani Mohanty, Om Prakash Gangil and Sudhir Kumar (2012), Instrumental Activities of Daily Living and Subjective Wellbeing in Elderly Persons Living in Community, Indian Journal of Gerontology, Vol. 26, No. 2. pp. 193-206

Stathi A ,Fox, K. R. and McKenna, J., (2002). Physical activity and dimensions of subjective well-being in older adults, Journal of Aging and Physical Activity, 10 (1), pp. 76-92.

Sulander, T.T., Rahkonen, O.J. and Utela, A.K., (2003), Functional Ability in the Elderly Finnish Population Time Period Differences and Associations, Scandinavian Journal of Public Health. 31(2):100-106.