



Prevalence and Correlates of Functional Limitation among Elderly in Kerala



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Abstract

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 is, therefore, important for policy development in the care of the elderly. The most effective way to reduce the proportion of the population with disabilities is to delay the onset of disabilities. Living independently in familiar surroundings surely promotes a better aging and the development of living environments together with functional ability exert a profound influence on active aging. In Kerala situation, geriatric care should be focused on the necessities of elderly women since they have to live more years with functional limitation and disability than males. 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 result in poor health status, disability and loss of functional health. Information on disability is very important in responding to the care of the elderly.

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1. Introduction

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

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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 tends to increase with increased 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 to 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 by 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, traveling 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 wellbeing and improved functional status of the elderly are intimately linked with their educational status because education enables greater adaptability to change 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).

2. Research Methods

2.1 Aging in Kerala

The aging scenario of Kerala is much prominent than in any other states of India. Kerala has the largest proportion of the 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 the 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.

2.2 Objectives

The aim of the present study are 1) to examine the demographic and socioeconomic 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 on the measures that encouraging the abilities to perform any activities of daily living of elderly and care of elderly.

2.3 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 aging 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 are 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.

3. Results and Analysis

Table 1
Gender wise ability to do instrumental activities of daily living

Instrumental Activities of Daily Living	Male	Female
Ability to use the telephone	45.3	54.7
Shopping	57.2	42.8
Food Preparation	31.5	68.5
Housekeeping	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)
	Currently not working	416(35.6)	379(32.4)	374(32.0)	1169(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	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 has 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 increase 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			Total
		Low	Medium	High	
Vision	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 percent for the vision to 45 percent 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 a 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 is seen with a high functional dependence. The great majority of the elderly are out of the

disability problems with hearing. Among these, 27 percent 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 percent) are having low IADL scores while 15.0 percent of elderly with full disability in speaking is having high IADL. About 20 percent of elderly are suffering from some kind of disability in memory. Among them, the majority is with low IADL scores. Elderly who have not affected disability in memory, about 28 percent 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 5 th class)*	-.536	.585	Edn (Upto 5 th 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 a spouse or living alone are 2 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 a bad rating.

Healthy Life Expectancy

In this study, the healthy life expectancy of the elderly people was calculated. For this, in an 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)

Age	Total			Male			Female		
	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 of 60 was expected to live nearly about 13 years 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 in males.

Table 6
Healthy Life Expectancy (Free of Disability)

Age	ex	Total		Ex	Male		ex	Female	
		He _x	Difference		He _x	Difference		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 of 60 was expected to live nearly about 16 years in a state with a 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 a 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](#)

[Anjana, A., & Chacko, A. T. \(2014\). Prevalence and correlates of functional limitation among elderly in Kerala. International Research Journal of Management, IT and Social Sciences, 1\(1\), 22-29. <https://sloap.org/journals/index.php/irjmis/article/view/249>](#)

(2013). Increase in age of elderly contributes to 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 relationship 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 the 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 studied 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.

4. Conclusion

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 is, therefore, important for policy development in the care of the elderly. The most effective way to reduce the proportion of the population with disabilities is to delay the onset of disabilities. Living independently in familiar surroundings surely promotes a better aging and the development of living environments together with functional ability exert a profound influence on active aging. In Kerala situation, geriatric care should be focused on the necessities of elderly women since they have to live more years with functional limitation and disability than males.

Conflict of interest statement and funding sources

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Statement of authorship

The author(s) have a responsibility for the conception and design of the study. The author(s) have approved the final article.

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