Research Article

Functional assessment of elderly population: a community-based cross-sectional study

Anupama P, Poonam R Naik, Pracheth R

Department of Community Medicine, Yenepoya Medical College, Yenepoya University, Deralakatte, Mangalore, Karnataka, India.
Correspondence to: Anupama P, E-mail: anupamapeetambran10@gmail.com

Received July 16, 2015. Accepted August 8, 2015

Abstract

Background: Aging is a common, strong, and permanent process, which is affected by biological, social, psychological, and environmental factors.

Objective: To assess the level of dependency among the study participants using Katz scale for basic activities of daily living and Lawton's scale for instrumental activities of daily living.

Materials and Methods: A cross-sectional, community-based study was conducted in Harekala village, Karnataka, India. Adults aged 60 years and older were included in the study as the participants. Systematic random sampling was followed to reach the calculated sample size of 221. Households were the sampling unit. Data were collected using a predesigned, pretested questionnaire to elicit information on sociodemographic profile. The basic activities were evaluated using the Katz Index, while the instrumental activities were recorded using the Lawton's scale. Independent *t*-test was used to compare the mean Katz score/Lawton's score of those with morbidity with those without morbidity.

Result: Of the 221 participants, 121 were aged older than 70 years. A total of 120 were male and 101 were female subjects. About 56.1% of the participants were hypertensive, and about 20.4% revealed other cardiovascular diseases. As per Lawton's scale, it was observed that the majority of the participants required assistance or were totally dependent in managing money (10.4%) and doing housework (14.5%). About 40.3% of them needed assistance in feeding, and about 26.7% participants were unable to do toileting activity by themselves. Statistically significant difference was observed between the mean Katz scores of those subjects with cardiovascular disease and those without cardiovascular disease. Similarly, statistically significant difference was observed between the mean Lawton scores of subjects with cardiovascular disease and those without cardiovascular disease.

Conclusion: Prevention of functional decline of the elderly people needs priority and such prevention may be possible by the way of detecting the functional decline at an early stage.

KEY WORDS: Aging, functional status, disability, elderly

Introduction

Aging is a common, strong, and permanent process, which is affected by biological, social, psychological, and environmental factors. Aging occurs at an earlier age in individuals living in regions with a greater economic development than in individuals living in regions with lesser development.[1] According to the WHO, there were almost 400 million people aged 60 years or older living in developing countries, in 2002. It is estimated that this number will increase to around 840 million in 2025, representing 70% of the elderly people in the world.[1]

Along with advanced age comes disability, which is defined as any limitation in performing an activity within the range that is considered normal for life. Functional status is the ability of an individual to live independently and associate with their surroundings or carry out normal daily activities necessary to meet the basic needs, achieve the normal roles, and maintain health and well-being. Reduced function itself can be the

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2016.1607201578	

appearance of otherwise occult pathologies.[2] Deprivation in functional status is related to an elevated risk of institutionalization and falls, and it is considered an absolute risk factor for mortality.[3] Functional capacity is studied in order to assess the individual's health status, so as to increase their life expectancy by improvizing on health care. Functional capacity is measured by focusing on two domains: basic activities of daily living, otherwise called self-care activities and instrumental activities of daily living, otherwise called mobility skills or activities for maintaining the environment. One of the best approach to measure the health status of older adults is through the functional assessment, which provides objective data that may signify future decline or developments in health status, allowing the physician to plan and intervene appropriately.[4] Geriatric assessment helps in the findings of medical situations; improvement of treatment and follow up plans; organization of control of care; and estimation of long-term care needs.[5] The basic activities are concerned with individual's self-care such as feeding, taking a bath/shower, and dressing themselves. On the other hand, instrumental activities comprise complicated actions that are associated with the individual's social input, such as shopping, responding to the telephone, and using the means of transportation.[1]

The objective of this study was to assess the level of dependency among the study participants using Katz scale for basic activities of daily living and Lawton's scale[6] for instrumental activities of daily living.

Materials and Methods

Institutional ethics committee approval was obtained. A cross-sectional, community-based study was conducted in Harekala village, Mangalore thaluk, Dakshina Kannada district, Karnataka, India, from November 2014 to January 2015. Currently, this village has a population of 6,814 with 1,144 households. Adults aged 60 years and older were included in the study as the participants. A sample size of 221 was calculated using population proportion 26.5%, sample proportion 35%, power 80%, and Alpha 5%. Systematic random sampling was done to reach a sample size of 221. A list of households were considered as the sampling frame. Households were the sampling unit.

Written informed consent was obtained from the participants. Data were collected using a predesigned, pretested questionnaire to elicit information on sociodemographic profile. The basic activities were evaluated using the Katz Index, while the instrumental activities were recorded using the Lawton's scale. These instruments were chosen because of their widespread use in studies and the recognition they have received, regarding the functional assessment for elderly people within primary care. Katz scale assessed six self-care activities (bathing, dressing, toileting, transferring, continence, and feeding) and Lawton's scale assessed seven instrumental activities (using telephone, traveling, shopping, preparing meals, doing housework, taking medicine, and managing money). For each activity of daily self-care evaluated, two alternative responses were proposed relating to the categories of complete independence and partial or total dependence. For each instrumental activity of daily living, three alternative responses were proposed relating to the categories of complete independence, need of help in performing activity, and inability in performing activity.

Data were analyzed with SPSS software, version 22. Descriptive statistics were reported as mean ± SD for continuous variables and as frequency and percentage for categorical variables. Independent *t*-test was used to compare the mean scores of Katz and Lawton's scale with morbidities.

Result

Table 1 shows the sociodemographic profile of the study participants. It was found that 54.8% participants were aged older than 70 years. Male subjects comprised 54.3% of the population and female subjects were 45.7% of the population. About 51.1% of the participants were widows. About 56.1% of the participants were hypertensive, and about 20.4% presented with other cardiovascular diseases.

Table 2 shows the morbidity profile of participants. The various comorbidities seen were hypertension (HTN), diabetes mellitus, cardiovascular disease, renal disease, and osteoarthritis.

Table 3 shows the level of dependence in activities of daily living, according to the Katz scale. The majority of the participants were dependent on feeding, followed by toileting activity.

Table 4 shows the level of dependence in instrumental activities of daily living, according to Lawton s scale. It was observed that the majority of the participants required assistance or were totally dependent in managing money (10.4%) and doing housework (14.5%).

Tables 5 and 6 show the relation between various comorbidities according to Katz scale and Lawton's scale, respectively.

Statistically significant difference was observed between the mean Katz scores of those subjects with cardiovascular disease and those without cardiovascular disease. Similarly, statistically significant difference was observed between the mean Lawton scores of subjects with cardiovascular disease and those without cardiovascular disease.

Discussion

In this study, 121 of 221 participants were aged older than 70 years. A total of 120 were male and 101 female subjects. Ninety were married and 128 were widow/widowers. About 35.7% of the participants were not employed; they did only household chores. About 40.3% needed assistance in feeding, and about 26.7% were unable to do toileting activity by

Table 1: Sociodemographic profile of the study participants (*N* = 221)

Variable	Frequency	Percentage
Age (years)		
<70	100	45.2
>70	121	54.8
Gender		
Male	120	54.3
Female	101	45.7
Marital status		
Married	90	40.7
Widow	113	51.1
Widower	15	6.8
Separated/divorced	1	0.5
Never married	2	0.9
Occupation		
Unskilled labor	15	6.8
Agriculture	30	13.6
Household chores	79	35.7
No occupation	55	24.9
Other	42	19.0

Table 2: Morbidity profile of the study participants (*N* = 221)

Morbidity	Frequency (%)
HTN	124 (56.1)
Diabetes mellitus	92 (41.6)
Cardiovascular disease	45 (20.4)
Others	113 (51.1)

Table 3: Independence in the activities of daily living according to Katz index

Katz index	Dependent, *N* (%)	Independent, *N* (%)
Bathing	26 (11.8)	195 (88.2)
Dressing	42 (19.0)	179 (81.0)
Toileting	59 (26.7)	162 (73.3)
Transferring	27 (12.2)	194 (87.8)
Continence	39 (17.6)	182 (82.4)
Feeding	89 (40.3)	132 (59.7)

Table 4: Independence in the activities of daily living according to Lawton's scale
1 = totally dependent; 2 = requires assistance; 3 = independent.

Lawton's score	1	2	3
Using telephone	24.0	61.1	14.9
Traveling	29.4	54.3	16.3
Shopping	29.0	56.1	14.9
Preparing meals	24.9	55.7	19.5
Housework	23.5	62.0	14.5
Taking medicine	22.6	61.1	16.3
Managing money	28.1	61.5	10.4

Table 5: Relation between various comorbidities and Katz score

Morbidity	Yes/no	Frequency	Mean ± SD	*t*	*p*
CVD	Yes	45	4.31 ± 1.34	2.28	0.026*
	No	176	4.82 ± 1.39	2.24	
HTN	Yes	124	4.79 ± 1.34	0.89	0.37
	No	97	4.62 ± 1.46	0.88	
Type II DM	Yes	92	4.59 ± 1.45	1.12	0.25
	No	129	4.81 ± 1.35	1.13	

CVD, cardiovascular disease; HTN, hypertension; DM, diabetes mellitus.
*Statistically significant.

Table 6: Relation between various comorbidities and Lawton score

Morbidity	Yes/no	Frequency	Mean ± SD	*t*	*p*
CVD	Yes	45	12.33 ± 2.68	2.45	0.016*
	No	176	13.49 ± 3.33	2.15	
HTN	Yes	124	13.29 ± 3.03	0.19	0.851
	No	97	13.20 ± 3.49	0.191	
Type II DM	Yes	92	13.09 ± 3.34	0.59	0.551
	No	129	13.36 ± 3.18	0.60	

CVD, cardiovascular disease; HTN, hypertension; DM, diabetes mellitus.
*Statistically significant.

themselves. Sharma et al.[7] conducted a study on 300 elderly subjects to assess the performance of activities of daily living, and they reported that the maximum (72%) subjects were in the age group of 60–69 years. About 60% were female subjects and married. About 39% were widows/widowers. About 65% of subjects were illiterate and the majority (83%) of them was not working. Around 82% of subjects were fully functional in the performance of activities such as bathing, dressing, toileting, transferring, continence, and feeding. About 16.3% were dependent for the activity of toileting, followed by the activities of transferring, dressing, and bathing. Female subjects were significantly more functional and showed less impairment than men.

Iliffe et al.[8] conducted a study on elderly persons (aged > 75 years) residing in London. Functional assessment revealed that 18.4% of the participants showed incontinence of urine and 5.9% showed feces incontinence. The major functional problems were bathing, housework, shopping, washing and ironing, and cooking. Pinholt et al.[9] did a study on 79 elderly people. The prevalence of functional impairment was high: 25 (32%) of the 79 patients were mentally impaired, 31 (39%) were malnourished, 18 (23%) were visually impaired, 31 (39%) showed impaired gait, and 23 (29%) showed problems with continence.

In a study conducted by Wu,[10] 82% of the participants rated themselves as healthy and functional older community residents. However, data showed that the elderly people needed the following community services: preventive health (99.8%), psychotropics (94.8%), visual function (59.2%), social function (49.8%), health promotion (36.1%), and reduction of formal services (31.3%). The functional capabilities of elderly persons are an important indicator of their degree of independence. Functional dependence to carry out basic and instrumental activities of daily living suggest the need for preventive measures or even therapeutic interventions.[1]

In a study conducted by Del Duca et al.,[1] the prevalence of disability relating to basic activities was 26.8%. The lowest proportion of independence was in relation to controlling the urination and/or evacuation functions. In relation to instrumental activities, the prevalence of disability was 28.8%, particularly, in relation to moving around and using the means of transportation.

Katz and Lawton scales are effective tools to assess the functional status in the community. The study has been conducted in the field practice area of the teaching institution. Therefore, future research should be conducted among elderly persons across different parts of the country. The information thus obtained will help to formulate strategies for early identification of functional dependence and management.

Conclusion

Disability is a strong predictor of morbidity among the elderly population. Functional dependence in carrying out the basic and instrumental activities of daily living was observed among the elderly people. Prevention of functional decline of the elderly people needs priority and such prevention may be possible by way of detecting the functional decline at an early stage.

References

1. Del Duca GF, Silva MC, Hallal PC. Disability relating to basic and instrumental activities of daily living among elderly subjects. Rev Saude Publica 2009;43(5):796–805.
2. Quinn TJ, McArthur K, Ellis G, Stott DJ. Functional assessment in older people. BMJ 2011;343:4681.
3. Dolai MC, Chakrabarty F. Functional status of the elderly Santal people. Int J Human Soc Sci Inv 2013;2(1):1–6.
4. Katz S, Downs TD, Cash HR, Grotz RC. Progress in the development of the index of ADL. Gerontologist 1970;10(1):20–30.
5. Elsawy B, Higgins KE. The geriatric assessment. Am Fam Physician 2011;83(1):48–56.
6. Lawton MP, Brody EM. Assessment of older people: self-maintaining and instrumental activities of daily living. Gerontologist 1969;9(3):179–86.
7. Sharma, Shalika, Thakur, Manjula, Kaur, Sukhpal. Assessment of functional status in the performance of activities of daily living amongst elderly in suburban population of India. Int J Nurs Educ 2012;4(1):94–6.
8. Iliffe S, Haines A, Gallivan S, Booroff A, Goldenberg E, Morgan P. Assessment of elderly people in general practice. 2. functional abilities and medical problems. Br J Gen Pract 1991;41:13–5.
9. Pinholt EM, Kroenke K, Hanley JF, Kussman MJ, Twyman PL, Carpenter JL. Functional assessment of the elderly. a comparison of standard instruments with clinical judgment. Arch Intern Med 1987;147(3):484–88.
10. Wu T. Functional health status of the elderly in Taiwan. Healthy Aging Clin Care Elderly 2010;2:9–17.

How to cite this article: P Anupama, Naik PR, R Pracheth. Functional assessment of elderly population: a community-based cross-sectional study. Int J Med Sci Public Health 2016;5: 438-442

Source of Support: Nil, **Conflict of Interest:** None declared.