



A STUDY TO ASSESS GERIATRIC IMPAIRMENT/DISABILITY IN PERFORMING ACTIVITIES OF DAILY LIVING (ADL) AND INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADL) AT A URBAN SLUM COMMUNITY IN MUMBAI.

DR. VINOD S KAMBLE*

Department of Community Medicine, BLDEU's Shri B M Patil Medical College, Bijapur, Karnataka.

ABSTRACT

Total 52 (32 males and 20 females) i.e. 8% of the 650 elderly people above 60 years interviewed had loco motor problems. Using Chi square test it was observed that there was a significant association between disability and activities of daily living (ADL) of 1) drinking 2) eating 3) dressing upper body 4) dressing lower body 5) grooming 6) controlling urination 7) control on bowel movements 8) getting in and out of the bathroom, $p < 0.05$. Significant association was observed between disability and the instrumental activities of daily living of 1) shopping 2) food preparation 3) housekeeping 4) laundry 5) use of transport 6) responsibility for own medication 7) handling own finances. Using Z test it was seen that there was a significant difference between males and females in all the activities of daily living except the activity of washing, bathing and walking up/down the stairs. Similarly significant difference between males and females was observed in the Instrumental activities of daily living of 1) using telephone 2) shopping 3) using transport 4) responsibility for own medication and 5) handling own finances, $p < 0.05$. 40 (76.92%) individuals performed activities of daily living and only 21(40.38%) individuals did instrumental activities of daily living. As age increased the score went down and disability increased.

KEYWORDS: Disability, Daily activities, Elderly.



DR. VINOD S KAMBLE

Department of Community Medicine, BLDEU's Shri B M Patil Medical College,
Bijapur, Karnataka.India

INTRODUCTION

Old age is an incurable disease. We cannot heal it but we can protect, promote and extend it.¹In India the size of the elderly population, with age above 60 years is 7.4% of the total population .It is projected to rise to 12.4% of population by the year 2026.²In South-east Asia, the prevalence of total disability ranges from 1.5 – 21.3% of the total population³. In India about 64 per thousand elderly persons in rural areas and 55 per thousand in urban areas suffer from one or more disabilities. Loco motor disability is the most common leading to 3% of

the total disabilities. This creates problems regarding the elderly health along with the economic burden on the family and country as the population increases.² Measuring the level of disability comprehensively could help to know the burden of disability, amount of help and the best resources needed by old people to manage disability and remain independent at the maximum.⁴ Hence a study to measure (ADL) Activities of daily living and Instrumental activities of daily living (IADL) was carried out.

AIMS AND OBJECTIVES

- 1) To study the impairment/disability amongst elderly regarding activities of daily living(ADL) and instrumental activities of daily living(IADL) .
- 2) To compare the impairment/disability amongst the males and females.

DESIGN

A cross sectional study was carried out.

METHODOLOGY

The total sample size taken was 650 based on the crude prevalence rate for overall disability of 38.23% after performing a pilot study. Random systematic sampling was done. All the people above 60 years age were interviewed and examined. Barthel's Index and Lawton Brody IADL Scale (Instrumental Activities of Daily Living) was used to assess the impairment /disability.

Statistical Tests

Chi square test was applied to find out the strength of association between disability and (ADL) activities of daily living along with (IADL) instrumental activities of daily living. Z test was applied to find out the difference between males and females.

RESULTS AND DISCUSSION

DEMOGRAPHIC PROFILE: Of the total individuals examined, 287 were males and 363 were females. 561 (86.31%) individuals were in the 60-74 years age group (young old), 78 (12%) were in the 75-84 years age group (old old) and 11 (1.69%) were in the above 85 years age group (super old).270 were Hindus, 359 were Muslim, 15 were Christian and 6 were from other religion. 234 males and 220

females were married. 12 males and 7 females were unmarried, 36 males were widower and 150 females were widow and 5 males and 6 females were divorcee . Considering literacy, 217 (33.38%) males and 98 females were literates. 70 males and 266 females were illiterate. 65 males and 45 females were living in a joint family. 211 males and 271 females were living in nuclear family. 7 males and 15

females were living alone. 4 males and 32 females were living with the relatives. 158 males and 132 females were having a chronic disease, 81 males and 71 females were having hypertension, 17 males and 12 females were having diabetes, 18 males and 27 females were suffering from arthritis. 52 males and 69 females were addicted to tobacco. 71 males and 6 females had smoking habit. 64 males and 104 females had habit of eating pan with

lime. 37 males and 8 females were consuming alcohol. 574 (88.31%) individuals were unemployed/retired and 76 (11.69%) were still employed. 52 (8%) individuals had loco motor problems in which 32 males and 20 females were present. The prevalence is high as compared to the study done by Officers of Social Statistics Division, Central Statistics Office, given in the book, Situation Analysis of The Elderly in India, 2011 which was 3%.²

Barthel's Index of Activities of Daily Living⁴ was used to assess disability in daily activities.

The Barthel's Index Scoring was done as below

Bowels

- 0 = incontinent (or needs to be given enemata)
- 1 = occasional accident (once/week)
- 2 = continent

Bladder

- 0 = incontinent, or catheterized and unable to manage
- 1 = occasional accident (max. once per 24 hours)
- 2 = continent (for over 7 days)

Grooming

- 0 = needs help with personal care
- 1 = independent face/hair/teeth/shaving (implements provided)

Toilet use

- 0 = dependent
- 1 = needs some help, but can do something alone
- 2 = independent (on and off, dressing, wiping)

Feeding

- 0 = unable
- 1 = needs help cutting, spreading butter, etc.
- 2 = independent (food provided within reach)

Transfer

- 0 = unable – no sitting balance
- 1 = major help (one or two people, physical), can sit
- 2 = minor help (verbal or physical)
- 3 = independent

Mobility

- 0 = immobile
- 1 = wheelchair independent, including corners, etc.
- 2 = walks with help of one person (verbal or physical)
- 3 = independent (but may use any aid, e.g., stick)

Dressing

- 0 = dependent
- 1 = needs help, but can do about half unaided
- 2 = independent (including buttons, zips, laces, etc.)

Stairs

- 0 = unable
- 1 = needs help (verbal, physical, carrying aid)
- 2 = independent up and down

Bathing

- 0 = dependent
- 1 = independent (or in shower)

Scoring

Sum the patient's scores for each item. Total possible scores range from 0 – 20, with lower scores indicating increased disability.

Association between disability and Activities of Daily Living (ADL) along with gender difference; Table no 1 & 2

From Table No 1 using Barthel's index it was found that apparently both males and females had maximum difficulty in performing the activity of 1) dressing the lower body, 2) washing and bathing, 3) walking 25 feet on the level and walking up/down the stairs. In a longitudinal study by Jagger C et al, it was observed that in both man and woman with median age 78 years, early development of disability appeared in activities for bathing, followed by mobility, toileting, dressing, transfer from bed, transfer from chair and feeding.⁵ This is similar to the present study in activities of dressing and bathing but differs for activities of mobility, toileting transfer from bed and chair and feeding. From Table no 2 using Chi square test it was observed that there was highly significant association between disability and activities of 1) drinking 2) eating <0.05 There was significant association observed between disability and activities of 1) dressing body upper 2) dressing lower body 3) grooming 4) controlling urination 5) control on bowel movements 6) getting in and out of the bathroom, $p < 0.05$. In a longitudinal study performed by Irene Marzona on more than one

thousand community living people (aged 72 years or more), it was found that most participants in the study reported only one or two difficulties in (BADL) basic activities of daily living, usually with bathing and dressing.⁶ This is in accordance with the present study in activity of dressing but differs for activity of bathing.

There was no significant association found between disability and activities of 1) washing and bathing 2) getting in and out of toilet 3) walking 25 feet on the level 4) walking up/down the stairs 5) control on bowel movements 6) getting in and out of the bathroom, $p > 0.05$. Using Z test it was seen that there was a significant difference between males and females in all the activities of daily living except the activity of washing, bathing and walking up/down the stairs. In a study done by Jagger et al it was seen that women showed a higher risk in disability for bathing (RR 1.6; 95% CI 1.3-1.9) and getting out from and to the toilet (RR 1.7; 95%CI 1.2-2.5) than men.⁵ This is similar for the activity of getting in/out of toilet but not for bathing in the present study. In a study by Fredric D Wolinsky et al it was found that age and female gender were the specific risk factors associated with ADL dependence which were non modifiable.⁷

Table no1
Showing the males and females distribution of Activities of Daily Living
using BARTHEL'S INDEX

Activities of daily living	Self Males	Self Females	Assistance Males	Assistance Females	Unable to do Males	Unable to do Females
Drinking from a cup	27	13	3	4	2	3
Eating	27	13	3	4	2	3
Dressing upper body	22	12	7	3	3	5
Dressing lower body	12	6	12	5	8	9
Putting brace or artificial limb	00	00	00	00	2	1
Grooming	22	11	6	4	4	5
Washing and bathing	12	9	7	3	13	8
Controlling urination	29	18	00	00	3	2
Controlling bowel movements	30	20	00	00	02	00
Mobility index						
Getting in and out of chair	22	12	7	3	3	5
Getting in and out of toilet	17	9	12	7	3	5
Getting in and out of bathroom	17	9	12	7	3	5
Walking 25 feet on the level	14	7	6	4	12	9
Walking up/down of stairs	12	8	6	0	14	12
With wheel chairs	00	00	00	00	3	5

Table no 2
Showing association between disability and Activities of Daily Living using Chi square test
and difference between males and females using z test

Activity	Yes/no	Chi square test	Z test for males and females	Disability yes	Disability no
Drinking from a cup	Yes 40	P=0.0005, Significant Association	P<0.05, Significant difference	10	30
	No 12			10	02
Eating	Yes 40	P=0.0001, Significant Association	Significant difference	08	32
	No 12			10	02
Dressing upper body	Yes 44	P=0.0048 Significant association	Significant difference	12	32
	No 08			06	02
Dressing lower body	Yes 18	P=0.0034 Significant association	Significant difference	06	12
	No 34			26	08
Grooming	Yes 33	P=0.0013 Significant association	Significant difference	10	23
	No 19			15	04
Washing and bathing	Yes 21	P=0.7721, No Significant Association	No Significant difference	09	12
	No 31			11	20
Controlling urination	Yes 47	P=0.0054, Significant association	Significant difference	07	40
	No 05			04	01
Controlling bowel movements	Yes 50	P=0.0124, Significant Association	Significant difference	10	40
	No 02			01	01
Mobility index					

Getting in and out of chair	Yes 34	P=0.0086 Significant association	Significant difference	10	24
	No 18			12	06
Getting in and out of toilet	Yes 26	P=0.0505 No Significant association	Significant difference	10	16
	No 26			18	08
Getting in and out of bathroom	Yes 26	P=0.0107 Significant association	Significant difference	10	16
	No 26			20	06
Walking 25 feet on the level	Yes 21	P=0.0898 No Significant association	Significant difference	08	13
	No 31			20	11
Walking up/down the stairs	Yes 20	P=0.0901 No Significant association	No Significant difference	08	12
	No 32			21	11

ADL SCORING ACCORDING TO AGE AND SEX; Table no 3

Of the total 52 individuals, 37 (71.15%) individuals were able to score only up to 05 points and rest 15(28.85%) had score above 05.

In the age group 60-74 years, 25 (48.09%) had score below 10 and 05 (9.62%) had score above 10 points.

In the age group 75-84 years, 15 (28.85%) had score below 10 and 02(3.85%) had score above 10 points.

In the age group >85 years, 05 (9.62%) had score below 10 and nobody had scored above 10 points.

Hence it is observed that in all the age groups most of the individuals had score below 05 points. Also as age increased the score decreased. In a study done by Officers of Social Statistics Division, Central Statistics Office, the proportion of mobility in elderly men

and women was 94 to 95 per cent among those in the age-group 60 – 64 year. It was 72% for men and 63 to 65 percent for women of age 80 or more.²In the present study number of people who had scored up to 10 points decreased from 15 (28.84%) males and 10 (19.23%) females in the age group 60-74 years to 09(17.31%) males and 06(11.54%) females in the age group 75- 84 years. In the age group >85 years it was only 3(5.77%) males and 2(3.85%) females. Hence the results in the present study are similar to the above study. In a study by the WHO (2003; 2006) it was estimated that 10% of the world's population has some form of disability, 20% of those aged 70+, and 50% of those aged 85+ had disability. That is, with increasing age, disability increases and, among those who were elderly (age 65 and over), the old elderly were more likely to experience disability than are young elderly.^{8, 9}

Table no 3
Showing Activities of daily living (ADL) score in males and females according to the age group.

ADL SCORE	0-5		6-10		11-15		>16		TOTAL
	Males	females	males	Females	males	Females	Males	Females	
AGE IN YEARS									
60-74	12	08	03	02	01	01	02	01	30
75-84	08	05	01	01	01	00	01	00	17
>85	02	02	01	00	00	00	00	00	05
TOTAL	22	15	05	03	02	01	03	01	52

Instrumental Activities of Daily Living scoring, (A to H activity); Table no 4

TOTAL: IADL Activities: A. telephone: 23 (17 males+06 females), B. shopping: 34 (22males+12 females), C. food preparation: 19 (10 males+9 females) food preparation: 12, D. housekeeping: 32 (18 males+14 females), E. laundry: 25(15males+10 female), F. Use of transportation: 34 (22 males+12 females), G. Take responsibility for their own medication: 27 (15 males+12 females), H. handle finances: 23 (15 males+08 females)

Table no 4
Showing male and female distribution according to the Instrumental Activities of Daily Living (IADL) Score

IADL Parameter	Males	Females	Total
A. Telephone	17	06	23
1. score 1	05	07	12
2. score 1	05	01	06
3. score 1	02	03	05
4. score 0	15	14	29
B. Shopping	22	12	34
1. score 1	10	05	15
2. score 0	05	05	10
3. score 0	07	02	09
4. score 0	10	08	18
C. Food preparation	10	09	19
1. score 1	05	05	10
2. score 0	03	01	04
3. score 0	02	03	05
4. score 0	22	11	33
D. Housekeeping	18	14	22
1. score 1	10	09	19
2. score 1	03	02	05
3. score 1	03	02	05
4. score 1	02	01	03
5. score 0	14	11	25
E. Laundry work	15	10	25
1. score 1	05	06	11
2. score 1	10	04	14
3. score 0	17	10	27
F. Mode of transportation	22	12	34
1. score 1	12	07	19
2. score 1	05	02	07
3. score 1	03	01	04
4. score 0	02	02	04
5. score 0	10	08	18
G. Responsibility of own medications	15	12	27
1. score 1	10	08	18
2. score 0	05	04	09
3. score 0	17	08	25
H. Ability to handle finances	15	08	23
1. score 1	10	03	13
2. score 1	05	05	10
3. score 0	17	12	29

IADL Scoring using Lawton & Brody Scale¹⁰**A. Ability to use telephone**

1. Operates telephone on own initiative; looks up and dials numbers, etc. 1
2. Dials a few well-known numbers 1
3. Answers telephone but does not dial 1
4. Does not use telephone at all 0

B. Shopping

1. Takes care of all shopping needs independently 1
2. Shops independently for small purchases 0
3. Needs to be accompanied on any shopping trip 0
4. Completely unable to shop 0

C. Food preparation

1. Plans, prepares, and serves adequate meals independently 1
2. Prepares adequate meals if supplied with ingredients 0
3. Heats and serves prepared meals, or prepares meals but does not maintain adequate diet 0
4. Needs to have meals prepared and served 0

D. Housekeeping

1. Maintains house alone or with occasional assistance (e.g., "heavy work domestic help") 1
2. Performs light daily tasks such as dishwashing, bed making 1
3. Performs light daily tasks but cannot maintain an acceptable level of cleanliness 1
4. Needs help with all home maintenance tasks 1
5. Does not participate in any housekeeping tasks. 0

E. Laundry

1. Does personal laundry completely 1
2. Launders small items; rinses stockings, etc. 1
3. All laundry must be done by others 0

F. Mode of transportation

1. Travels independently on public transportation or drives own car 1
2. Arranges own travel via taxi, but does not otherwise use public transportation 1
3. Travels on public transportation when assisted or accompanied by another 1
4. Travel limited to taxi or automobile with the assistance of another 0
5. Does not travel at all 0

G. Responsibility for own medications

1. Is responsible for taking medication in correct dosages at correct time 1
2. Takes responsibility if medication is prepared in advance in separate dosages 0
- . Is not capable of dispensing own medication 0

H. Ability to handle finances

1. Manages financial matters independently (budgets, writes checks, pays rent and bills, goes to bank), collects and keeps track of income 1
2. Manages day-to-day purchases, but needs help with banking, major purchases, etc. 1
3. Incapable of handling money 0

IADL SCORING ACCORDING TO AGE AND SEX; Table no 5

In the age group 60-74 years, 07 (13.46%) had score below 10 and 05 (9.62%) had score above 10 points. In the age group 75-84 years, 04 (7.69%) had score below 10 and 02(3.85%) had score above 10 points. In the age group

>85 years, 03 (5.77%) had score below 10 and nobody had scored above 10 points.

Hence it is observed that in all the age groups of total 52 people, maximum 44 (84.62%) people were able to score in the activities of daily living (ADL) and 12 (23.08%) people were not able to score. Of total 52 people only 21

(40.38%) individuals were able to score in the instrumental activities of daily living (IADL) and rest 31 (59.62%) individuals were not able to perform the activities. Hence there is much difference between the percentage of people performing ADL and IADL. The scoring percentage decreased with ageing in all the age groups and percentage of disability in performing instrumental activities of daily living is higher than activities of daily living. In a study done at Tampere, it was noticed that there was an increase in functional disability by age, and more among women. Among men, aged 60 – 64 years, 7% had poor functional ability, compared with 22% among men aged 85 – 89 years. For women the figures were 6% and 47%, respectively. This is similar to the present study where 13.46% people were able to perform instrumental activities in 60-74 years age group as compared to 5.77% in >85 years age group.¹¹ In another study at

Philadelphia it was seen that 9% of the men and 12% of the women aged 60 – 69 years had difficulties in moving outdoors. Among 80 – 89 years old, the respective figures were 33% and 53%. Significant differences also existed between men and women with respect to health conditions in the study.¹² This is also similar to the present study. In the current study total 34 people (65.38%) had travelling problem. In a study by Hom Nath Chalise et al in Nepal the most difficult activity of the five IADL items was travelling (20.5%) for both men and women.¹³ Hence in the present study the difficulty was much higher. In the present study only 10 males (19.23%) were able to prepare food which was the lowest number amongst males in all the instrumental activities. In the study by Hom Nath Chalise et al in Nepal, preparing meals was the most difficult function for men to perform. Hence both studies have similar results.

Table no 5
Showing Instrumental Activities of daily living (ADL) score in males and females according to the age group.

IADL SCORE	0-5		6-10		11-15		>16		TOTAL
AGE IN YEARS	Males	Females	males	Females	males	Females	males	females	
60-74	01	02	03	01	01	01	02	01	12
75-84	01	01	01	01	01	00	01	00	06
>85	00	01	01	01	00	00	00	00	03
TOTAL	02	04	05	03	02	01	03	01	21

Association between disability and Instrumental Activities of Daily Living (IADL) along with gender difference; Table no 6

Using chi square test, Significant association was observed between disability and the instrumental activities of daily living of 1) shopping 2) food preparation 3) housekeeping 4) laundry 5) use of transport 6) responsibility for own medication 7) handling own finances, $P < 0.05$. Significant difference between males and females using z test was observed in the

activities of 1) using telephone 2) shopping 3) using transport 4) responsibility for own medication and 5) handling own finances, $p < 0.05$. In a cross sectional study by Whiteneck et al and Stuck et al, comparing patients who were not disabled and aged between 65 and 85 years, participants 85 years old scored significantly lower in the personal care, communication, housing and mobility items and in the interpersonal relationship, community life and leisure item of the social domain.^{14,15}

Table no 6

Showing association between disability and instrumental activities of daily living using Chi square test along with gender difference using z test.

IADL Activity	Yes /no	Disability Yes	Disability No	Chi square test	Z test
A. Telephone	Yes 23	08	15	P=0.1602,NSA	P<0.05, SD
	No 29	16	13		
B. Shopping	Yes 34	10	24	P=0.0387,SA	P<0.05, SD
	No 18	11	07		
C. Food preparation	Yes 19	07	12	P=0.0469, SA	P<0.05,SD
	No 33	22	11		
D. Housekeeping	Yes 22	08	14	P=0.0485, SA	p>0.05,NSD
	No 30	20	10		
E. Laundry Score	Yes 25	10	15	P=0.02387, SA	p>0.05,NSD
	No 27	20	07		
F. Mode of transportation	Yes 34	06	28	P=0.0002, SA	p<0.05, SD
	No 18	13	05		
G. Responsibility for own medications	Yes 27	08	19	P=0.0050, SA	p>0.05,NSD
	No 25	18	07		
H. Ability to handle finances	Yes 23	06	17	P=0.0018, SA	P<0.05,SD
	No 29	21	08		

SA= significant association, SD=significant difference, NSA=No significant association, SD=no significant difference.

Disability duration and IADL Scoring; Table no 7

It was found that 08 (15.38%) individuals had disability for less than 5 years and 13 (25%) had disability for more than 5 years of the total 52 individuals. Individuals with disability for less than 5 years: 06 (11.54%) individuals had score below 10 and only 02 (3.85%) had score

above 10 points. Individuals with disability for more than 5 years: 08 (15.38%) had score below 10 and 05 (9.62%) had score above 10 points. From the result, it was seen that of the total 21 individuals performing instrumental activities of daily living maximum 13 (61.90%) individuals are having disability above 5 years.

Table no 7

Showing distribution of Instrumental activities of daily living score in males and females according to duration of disability.

Duration of disability in years	IADL SCORE								Total
	0-5		6-10		11-15		>15		
	Males	females	males	Females	Males	females	males	females	
<5 years	01	03	01	01	01	01	00	00	08
>5 years	01	01	04	02	01	00	03	01	13
Total	02	04	05	03	02	01	03	01	21

CONCLUSION

Activities of daily living (ADL) and Instrumental activities of daily living (IADL) are hampered as age and disability increases. Significant gender difference was observed in performing these activities. Physical and cognitive function can be measured by measuring the Activities of daily living and Instrumental activities of daily living score. It was observed that IADL function was lost before ADL function. There was reduction in physical and cognitive function.

RECOMMENDATION

The level of disability should be measured comprehensively to know the prevalence of disability and the steps to be taken to help the old people to manage disability and make them independent. To prevent ADL dependence, as well as IADL dependence, identification of risk factors for IADL dependence is important because of the sequential relationship between ADL and IADL.

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