

Functional Status of Senior Citizens of a Metropolitan City in Morang

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ABSTRACT

Background

Functional abilities start to decelerate after the age of 70 and causes need for assistance to do their basic activities of daily living (BADL) as well as instrumental activities of daily living (IADL).

Objective

To find out the functional status of senior citizens of a Metropolitan city in Morang.

Method

A descriptive cross-sectional study was carried out at Biratnagar Metropolitan City among 254 senior citizens receiving old age allowance using cluster sampling technique. Data were collected through face to face interview and measuring height and weight by researcher herself for the period of four weeks. Basic activities of daily living and instrumental activities of daily living were assessed using Katz Index of Basic Activities of Daily Living and Lawton Instrumental Activities of Daily Living tool with some modifications. Chi square test was used to assess the association between variables.

Result

About 48.4% and 90.6% of senior citizens had dependency in Basic Activities of Daily Living and Lawton Instrumental Activities of Daily Living respectively. The most common dependency for Basic Activities of Daily Living and Instrumental Activities of Daily Living was control of urination and defecation (31.9%) and using telephones (75.2%) respectively. Basic activities of daily living was significantly associated with age ($p=0.0017$), sex ($p=0.013$), literacy status ($p=0.001$), years of smoking ($p=0.0029$), social participation (0.0029) and history of fall within 1 year ($p=0.038$). Likewise Instrumental Activities of Daily Living was significantly associated with age ($p=0.03$), sex ($p=0.035$), literacy status ($p=0.002$), exercise ($p=0.033$) and social participation ($p=0.001$).

Conclusion

It is concluded that about half of the senior citizens are dependent in Basic Activities of Daily Living and almost all of them are dependent in Instrumental Activities of Daily Living. So senior citizen clubs/ groups are suggested to be strengthened which may be effective in promoting independence, extending an active and healthy ageing.

KEY WORDS

Basic activities of daily living, Functional status, Instrumental activities of daily living, Senior citizens

INTRODUCTION

Ageing is a normal physiological and developmental process of growing older regardless of chronologic ages. As a result of declining fertility, mortality as well as improved public health intervention, population ageing has been a world wide phenomenon.² The number of senior citizen is expected to double by 2050 with approx. 2.1 billion globally.³ In Nepal, the total population of senior citizen is expected to rise from 8.9% (26,20,809) to 22% (65,10,009) of total population from 2018 to 2050.⁴ According to WHO, functional status is the extent to which an individual is able to perform activities that are associated with the routines of daily living.

The prevalence of functional disability in senior citizens aged 69 years and above was 29.5% and 43.4% in high income countries respectively.⁵ Study shows 82.9% of senior citizens in Teheran were independent while 6.4% were moderately dependent and only 10.7% were fully dependent in doing basic activities of daily living (BADL).⁶ Among the senior citizens of Karnataka, India 58.62% were moderately dependent, 25.9% were severely dependent and only 15.25% were independent in doing Instrumental activities of daily living.⁷ Also among the senior citizen aged 65 years and above in Nepal, 12.8% (12.3% men, 13.3% women), 36.8% (26.0% men, 50.0% women) had functional dependency in activities of daily living (ADL) and instrumental activities of daily living (IADL) respectively.⁸

This study was carried out with the general objective to find out the functional status of senior citizens of a metropolitan city in Morang.

METHODS

A quantitative descriptive cross-sectional study was used to find out the functional status of senior citizens aged 70 years and above receiving old age allowance in randomly selected wards i.e. ward 4, 6 and 12 of Biratnagar Metropolitan City (BMC). Probability cluster sampling technique was used to select the sample of study with the total sample size of 254. Sample size was calculated using the formula for cross-sectional studies assuming the following: prevalence of functional independence as 71%, 5% as the level of significance ($\alpha=0.05$), 7% as the absolute allowable error and 5% as nonresponse rate.⁹ Ethical approval of the research proposal was obtained from the Maharajgunj Nursing Campus and Institutional Review Committee (IRC no: 96(6-11.E)2/075/076) of Tribhuvan University, Institute of Medicine. Formal permission to collect the data was taken from health section of Biratnagar Metropolitan City office. Data was collected from face to face interview by researcher herself by using Nepali version of the tool question, assessing height and weight for the period of four weeks (10th September to 6th October, 2018).

Informed written consent was obtained from each respondents. Senior citizens with diagnosed congenital, childhood disability, bedridden due to fracture, fall injury, road traffic accident before 60 years of age were excluded from the study. Information was collected on sociodemographic characteristics, different variable (personal habits, social, participation, environmental condition and health status), level of BADL and IADL.

The functional status was assessed using the modified Katz index of independence in BADL and modified Lawton and Broody IADL tool.^{10,11} Permission to adopt and modify the both standard tool was obtained. Pretesting of the tool was done among 10% (25) of senior citizens in ward number 1 of BMC. The Chronbach α in the present study for Katz index of ADL and Lawton and Broody IADI tool was 0.88 and 0.87 respectively. Both the tool consist of 6 items which was categorized as 12: independent, 11-6: moderate dependent and 5-0: severe dependent. In the each item, highest score is 2 which represents independent in doing activities, while 1 and 0 represent needs assistance and fully dependent in doing activities respectively. Data was analyzed using SPSS version 16. Descriptive statistics (frequency, percentage, mean and standard deviation) was used to describe the data and after checking the data for normality by Saphirowilk test in which p value was 0.001 i.e. not normal distribution, inferential statistics (chi square test) was used to determine the association between BADL and IADL with different variables.

RESULTS

Table 1 elucidates 46.9% of senior citizens were age group of 70 - 79 years and 54.3% were female. Likewise, 49.6% were either widowed or widowed. Similarly, 49.4% were unable to read and write and 41.7% had informal education. 24.4% were current smokers. Regarding alcohol consumption, very few of them (5.9%) were currently consuming alcohol. Similarly, on aspect of exercise, 46.1% performed exercise.

Regarding the social relationship of respondents, table 2 shows that just less than half (48%) senior citizens participated in social activity and among participating majority (77.1%) participated in religious programs. Likewise 65.4% met relatives within past 2 weeks respectively. Just less than half of the respondents i.e. 39.8% had positive history of fall within last 1 year.

Regarding the items of BADL, table 3 shows that the dependence in doing BADL was found to be highest for the control of urination and defecation (31.9%) followed by feeding (31.4%), mobility inside the house (27.9%), bathing (9.4%), dressing (9.1%) and least for toileting (8.2%).

Concerning on the items of IADL, table 4 shows that the dependency of IADL was found to be highest in using the mobile phone/handling telephone (75.2%) followed by washing clothes (72.8%), travelling (65.7%), mobility

Table 1. Socio-demographic Characteristics and Personal Habit of the Respondents (n= 254)

Characteristics	Number	Percentage
Age group in completed yrs		
70 – 79	119	46.9
80 – 89	108	42.5
≥ 90	27	10.6
Mean ± SD: 79.87±7.0 yrs		
Sex		
Female	138	54.3
Male	116	45.7
Marital status		
Widower / Widowed	120	49.6
Having spouse	102	42.2
Separated	20	8.3
Unmarried	12	4.7
Literacy status		
Unable to read and write	151	59.4
Able to read and write	103	40.6
Educational status (n = 103)		
Informal	43	41.7
Primary level	32	31.1
Secondary level and above	28	27.2
Cigarette smoking		
Never	109	42.9
Former	83	32.7
Current	62	24.4
Years of current smoking (n = 62)		
≥ 40	38	61.3
1 – 40	24	38.7
Alcohol consumption		
Never	231	90.9
Former	8	3.1
Current	15	5.9
Performs exercise		
Daily	94	80.3
2-4 days	19	16.2
Weekly	4	3.4
Type of exercise (n = 117)		
Walking	68	58.1
Yoga	27	23.1
Specific prescribed exercise	22	18.8

outside the house (59.4%), doing simple household work (54.7%) and least for handling finances (51.9%).

Table 5 shows that around half of the respondents (51.6%) were independent in doing basic activities of daily living. Similarly majority of the respondents (62.6%) were moderately dependent in doing IADL.

Table 2. Social Relationship and Environmental Conditions Related Information of the Respondents

Variable	Number	Percentage
Participation in social activity		
Religious programs*	93	77.1
Socio political programs	16	26.4
Senior citizens club/programs	13	13.6
Meeting relatives within past 2 weeks		
Worship at home	198	78
Worship outside the house	133	52.4
Type of family		
Joint	120	47.2
Extended	81	31.9
Nuclear	53	20.9
Living with		
Son	122	48
Spouse and son	96	37.8
Other relatives	17	6.7
Alone	11	4.3
Daughter	8	3.1
Positive history of fall within last 1 year		
101	39.8	
Cause of fall (n=101)		
Slippery surface	37	36.6
Lack of physical support devices	35	34.7
Poor light and eyesight	17	16.8
Road traffic accident	12	11.9

*multiple response

Table 3. Items of Basic Activity of Daily Living of Respondents (n = 254)

Items	2	1	0
	No. (%)	No. (%)	No. (%)
Bathing	230 (90.6)	13 (5.1)	11 (4.3)
Dressing	230 (90.6)	16 (6.3)	8 (3.1)
Toileting	233 (91.7)	11 (4.3)	10 (3.9)
Mobility inside the house	183 (72.0)	61 (24)	10 (3.9)
Control of urination and defecation	173 (68.1)	58 (22.8)	23 (9.1)
Feeding	174 (68.5)	72 (28.3)	8 (3.1)

2: Fully independent, 1: Requires assistance, 0: Fully dependent on care giver

The above table 6 shows that there was statistical significant association between level of BADL and age, sex, literacy status, years of smoking as well as social participation with p value 0.017, 0.013, 0.00, 0.029 and 0.042 respectively. Likewise there was a statistical significant association between level of IADL and age, sex, marital status, literacy status, exercise as well as social participation with p value as 0.03, 0.02, 0.021, 0.03 and 0.001 respectively.

Table 4. Items of Instrumental Activity of Daily Living of Respondents (n = 254)

Items	2	1	0
	No. (%)	No. (%)	No. (%)
Using the mobile/landline tele-phones	63 (24.8)	142(55.9)	49 (19.3)
Doing the simple household work	115 (45.3)	97 (38.2)	42 (16.5)
Mobility outside the house	103 (40.6)	127(50.0)	24 (9.4)
Washing clothes	69 (27.2)	121(47.6)	64 (25.2)
Travelling	87 (34.3)	121(47.6)	46 (18.1)
Handling finances	122 (48.0)	92 (36.2)	40 (15.7)

2: Fully independent, 1: Requires assistance, 0: Fully dependent on care giver

Table 5. Level of Basic and Instrumental Activity of Daily Living of Respondent (n=254)

Basic Activity of Daily Living (BADL) & Instrumental Activities of Daily Living (IADL)	N ¹	N ²	% ¹	% ²
Independent (12)	131	24	51.6	9.4
Moderate dependent (11-6)	108	159	42.5	62.6
Severe dependent (5-0)	15	71	5.9	28

1= Number and percentage of BADL 2= Number and Percentage of IADL

Table 6. Association between Level of BADL, Level of IADL and selected Socio-demographic Characteristics, Social Relationship, Environmental Conditions and Health Status of Respondents (n=254)

Characteristics	Level of BADL		Level of IADL		χ ²	p value
	Independent	Dependent	Independent	Dependent		
	No. (%)	No. (%)	No. (%)	No. (%)		
Age						
≤ 80	55 (44)	70 (56)	5 (4)	120 (96)	5.654 ^a	0.017 ^{*a}
≥ 80	76 (58.9)	53 (41.1)	19 (14.7)	110 (85.3)	8.541 ^b	0.03 ^{*b}
Sex						
Male	50 (43.1)	66 (56.9)	6 (5.2)	110 (94.8)	6.135 ^a	0.013 ^{*a}
Female	81 (58.7)	57 (41.3)	18 (13.0)	120 (87.0)	4.564 ^b	0.02 ^{*b}
Literacy status						
Unable to read and write	65 (43.0)	86 (57.0)	9 (6.0)	142 (94.0)	10.84 ^a	0.001 [*]
Able to read and write	66 (64.1)	37 (35.9)	15 (14.6)	88 (85.4)	5.297 ^b	0.021 ^b
Cigarette smoking						
Yes	80 (55.2)	65 (44.8)	14 (9.7)	131(90.3)	1.751 ^a	0.186 ^a
No	51 (46.8)	58 (53.2)	10 (9.2)	99 (90.8)	0.17 ^b	0.897 ^b
Years of smoking						
1–40	9 (37.5)	15 (62.5)	1(4.2)	23(95.8)	4.753 ^a	0.029 ^{1a}
≥ 40	25 (65.8)	13 (34.2)	5(13.2)	33(86.8)		0.391 ^{1b}
Alcohol consumption						
Yes	11 (49.0)	14 (56.0)	4 (16)	21 (84)	0.637 ^a	0.425 ^a
No	120 (52.4)	109(47.6)	20 (8.7)	209 (91.3)	0.671 ^b	0.413 ^b
Exercise						
Yes	63 (53.8)	54 (46.2)	16 (13.7)	101 (86.3)	0.448 ^a	0.503 ^a
No	54 (46.2)	69 (48.4)	8 (5.8)	129 (94.2)	4.529 ^b	0.03 ^{*b}
Social participation						
Yes	71 (58.2)	51 (41.8)	23 (18.9)	99 (81.1)	4.122 ^a	0.042 ^{*a}
No	60 (45.5)	72 (54.5)	1(0.8)	131(99.2)	22.194 ^b	0.001 ^{*b}
Fall since last year						
Yes	44 (43.6)	57 (56.4)	7 (6.9)	94 (93.1)	0.038 ^a	0.038 ^{*a}
No	87 (56.9)	66 (43.1)	17 (11.1)	136 (88.9)	1.243 ^b	0.265 ^b
Meeting relatives in past 2 weeks						
Yes	90 (54.2)	76 (45.8)	18 (10.8)	148 (89.2)	1.089 ^a	0.297 ^a
No	41(46.6)	47 (53.4)	6 (6.8)	82 (93.2)	1.339 ^b	0.247 ^b

*p ≤ 0.05; Level of significance at 95% confidence interval, ^aBADL value, ^bIADL value, [#]fischer exact test

DISCUSSION

In this study, just more than half (51.6%) were independent in doing BADL while 42.5% were moderately dependent and only 5.9% were severely dependent. Inconsistent finding was found in another study conducted in Nepal where 71.1% of the senior citizens were independent while 25.29% were moderately dependent and 3.56% were fully dependent.⁹ This difference in level of dependency might be due to the difference in sample size i.e. the contrast study is conducted in among 1178 senior citizens. Similarly, another study in India, Haryana by showed that 52.6% were independent while 47.4% were dependent in BADL which is consistent with the current study.¹²

Regarding the level of Instrumental Activities of Daily Living, 62.9% of senior citizens were moderately dependent while 28% were severely dependent and only 9.4% were independent. The finding of the study is similar to another study conducted in India which showed that 83.93% were dependent in doing IADL.¹³ Also a study conducted in Nepal showed that 36.6% had dependency in doing IADL.⁹ The difference in level of dependency may be due to difference in sample where only Newar senior citizens were included in the contrast study.

The findings of the present study showed that there was significant association between BADL and age ($p=0.017$), sex ($p=0.013$), literacy status ($p=0.01$). Consistent with these finding a study conducted in India, Karnataka showed that BADL was significantly associated with age ($p=0.01$), sex ($p=0.001$), literacy status ($p=0.001$).¹³ Similarly another study in India conducted showed significant association between BADL and marital status which is inconsistent with the previous study findings.¹⁴ The inconsistent finding may be due to the difference in sample i.e. ≥ 60 years of senior citizens were included and setting i.e. study is conducted in rural part of Haryana. The finding of the present study showed no statistically significant association between BADL and interval of smoking and alcohol consumption status. Similarly a longitudinal study conducted in USA, Michigan showed no significant association between BADL and alcohol consumption which is consistent with the study findings.¹⁵

Regarding the social relationship of respondents, the present study showed statistically significant association between social participation ($p=0.042$) but not with meeting relatives within 2 weeks. Likewise inconsistent result was found in a study conducted in Japan, Nara which showed that BADL was significantly associated with meeting with family members (< 0.01).¹⁶ The inconsistent result might be due to the difference in sample size i.e. 23,710 senior citizens were included and data collection technique in contrast study i.e. questionnaire was mailed to all the respondents.

Regarding the association between BADL and environmental conditions as well as health status of respondents, the

present study showed that there was significant association between BADL and history of fall within past 1 year (0.038). Similar finding was found in another study conducted in India, that BADL was significantly associated with history of fall within 1 year (0.038).^{17,18}

IADL was found to be significantly associated with Age ($p=0.027$), sex ($p=0.033$) and literacy status ($p=0.02$). Similar study was found in Nepal which showed that intermediate level activities were associated with age, sex, literacy, marital status.⁹

However the present study also showed no significant association between IADL and smoking, years of smoking, alcohol consumption. Consistent finding was found in a study conducted in Nigeria by which showed that IADL was not significantly associated with smoking, alcohol consumption.¹⁹

Regarding the IADL and personal habits of the respondents, the present study showed significant association between IADL and exercise ($p=0.033$). Similar finding was found in another study in Norway which showed that IADL was significantly associated with physical activity.²⁰ Similarly a study conducted in India, Shimla showed that there was no significant association between IADL and exercise contradicts with the present study finding.¹⁸ The inconsistent finding may be due to the difference in sample size and setting where each 200 respondents from both urban and rural Shimla were included in the contrast study. The present study also showed no significant association between IADL and smoking, years of smoking, alcohol consumption. Consistent finding was found in a study conducted in Nigeria which showed that IADL was not significantly associated with smoking, alcohol consumption.

The limitations of the present study were that senior citizens with BADL dependency had also been included in finding out the level of IADL of senior citizens and only the senior citizens receiving old age allowance were included in the study. The finding of the study might be useful to the Biratnagar Metropolitan City in recognizing the functional status of senior citizens and address the modifiable risk factors that decrease dependency in both basic and instrumental activities of daily living.

CONCLUSION

About half of the senior citizen tends to be dependent in basic activities of daily living and almost all of them are dependent in instrumental activities of daily living. The routine home assessment of functional status of senior citizens is recommended for the early identification and slowing down of functional dependency. Also senior citizen clubs/groups are needed to be strengthened which can involve senior citizens in various programs promoting independency and extending an active, health life.

REFERENCES

1. Takma K, Bala R. A textbook of geriatric nursing. 1st edition. Kathmandu: Heritage publishers and distributors; 2017. 9-10.
2. Geriatric Centre Nepal. Status report on elderly people (60+) in Nepal on health, nutrition and social status focusing on research. Kathmandu: Geriatric Centre Nepal; 2010. Available from https://www.academia.edu/39059183/Status_Report_on_Elderly_People_60_in_Nepal_on_Health_Nutrition_and_Social_Status_Focusing_on_Research_Needs_Prepared_for_Government_of_Nepal_Ministry_of_Health
3. UN, Department of economic and social affairs, population division. World population ageing. London: United Nation; 2017. Available from <http://www.un.org/en/d>
4. Help Age International. Social pension database. London: HelpAge International; 2018. Available from Retrieved from <http://www.pension-watch.net/country-fact-file/nepal/>
5. WHO, World Bank. World disability report. Geneva: Switzerland; 2011. Available from http://www.who.int/disabilities/world_report/2011/report.pdf
6. Abbasian M, Ghalichi F, Ahmadi B, Ghasemzadeh P, Esmaeilpour E, Matalabi H. Status of daily living activities among older people in Maku. *Elder Health J*. 2016; 2(2):73-7. Available from https://www.researchgate.net/publication/313160310_Original_Article_Status_of_Daily_Living_Activities_among_Older_People_in_Maku
7. Veerapu N, Praveenkumar BA, Subramaniyan P, Arun G. Functional dependence among elderly people in a rural community of Andhra Pradesh, South India. *Int J Community Med Public Health*. 2016; 3(7): 1835-40. Available from doi:<http://dx.doi.org/10.18203/2394-6040.ijcmph20162051>
8. Chalise H, Saito T, Kai I. Functional disability in activities of daily living and instrumental activities of daily living among Nepalese Newar elderly. *Indian J Gerontol*. 2008;26(2):394-6. Available from <http://www.gerontologyindia.com/pdf/vol26-2.pdf>
9. Bista A, Joshi S. Physical activities of daily living of elderly of Lalitpur. *Indian J Gerontol*. 2016; 30 (4): 415-433. Available from <http://www.gerontologyindia.com/pdf/Vol-30-4.pdf>
10. Katz ST. Progress in development of the index of ADL. *Gerontologist*. 1970; 10(1): 20-30. Available from doi:https://doi.org/10.1093/geront/10.1_Part_1.20
11. Lawton M. Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist*. 1970; 9(3): 179-86. Retrieved from <https://www.semanticscholar.org/paper/Assessment-of-older-people%3A-self-maintaining-and-of-Lawton-Brody/35e2f446f48838fc036f376e5ff>
12. Gupta P, Mani K, Rai SK, Nongkynrih B, Gupta SK. Functional disability among elderly person in a rural areas of Haryana. *Indian J Public Health*. 2015;58(1):11-6. Available from oi:10.4103/0019-557X.128155
13. Dolai C, Chakrabarty F. Functional Status of the elderly Santal people. *Int J Humanit Soc Sci Invent*. 2013;2(1):1-6. Available from [http://www.ijhssi.org/papers/v2\(1\)/Version-3/A210106.pdf](http://www.ijhssi.org/papers/v2(1)/Version-3/A210106.pdf)
14. Khan ZA, Singh C, Khan T. Correlates of physical disability in the elderly population of Rural North India (Haryana). *J Family Community Med*. 2018 Sep-Dec;25(3):199-204. doi: 10.4103/jfcm.JFCM_160_17. PMID: 30220851; PMCID: PMC6130166.
15. Sowmiya KR, Kumar GP, Nagaranni. A study on prevalence and correlates of functional disability among the elderly in rural Tamilnadu. *Int J Med Res and Rev*. 2015; 3(4): 430-5. Available from doi:10.17511/ijmrr.2015.i4.086
16. Tomioka K, Kurumatani N, Hosoi H. Association Between Social Participation and Instrumental Activities of Daily Living Among Community-Dwelling Older Adults. *J Epidemiol*. 2016 Oct 5;26(10):553-61. doi: 10.2188/jea.JE20150253. Epub 2016 May 14. PMID: 27180933; PMCID: PMC5037253.
17. Wolinsky FD, Bentlers S, Hockenberry J, Jones MP, Obrian M, Weigel PAM, et al. Long term declines in ADLs, IADLs and mobility among older medicare beneficiaries. *BMC Geriatr*. 2011;11(43):1-12. Available from doi:<https://doi.org/10.1186/1471-2318-11-43>
18. Sharma D, Parashar A, Mazta S. Functional status and its predictor among elderly population in a hilly state of North India. *Int J Health Allied Sci*. 2014;3(1):159-63. Available from oi:10.4103/2278-344X.138593
19. Gureje O, Ogunniyi A, Kola L, Afolabi E. Functional disability in elderly Nigerians: Results from the Ibadan Study of Aging. *J Am Geriatr Soc*. 2006 Nov;54(11):1784-9. doi: 10.1111/j.1532-5415.2006.00944.x. PMID: 17087709; PMCID: PMC2820715.
20. Freitas RS, Farnesdes MH, Coqueiro RDS, Junior WMR, Rocha SV, Brito TA. Functional capacity and associated factors in the elderly: A population study. *Epidemiol Serv Saude*. 2012; 25 (6): 933-939. Available from doi: 10.5123/S1679-49742017000200007