

# Assessment of dependency in basic and instrumental activities of daily living among elderly-a community-based study

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## ABSTRACT

**Introduction:** Dependency is defined as receiving help from another person to complete the activity. It concludes six basic activities and eight instrumental activities of daily living. Human body undergoes numerous observable changes as we age, and aging is frequently associated with reduction in bodily functions leading to dependency.

**Objective:** To assess dependency in basic and instrumental activities of daily living among elderly

**Methodology:** Community based cross-sectional study was conducted in different wards of Changunarayan Municipality, Bhaktapur among 310 elderly during Feb 2023-May 2023. Face to face interview was conducted using convenient sampling technique. The collected data was analyzed using descriptive statistics like frequency, percentage and chi-square test was used to see the association

**Results:** Study showed that 51 (16.5%) elderly were dependent in basic activities of daily living and 122 (39.4%) revealed dependency in instrumental activities of daily living. Regarding components of basic activities of daily living, 105 (33.9%) had dependency in continence followed by bathing 51 (16.5%). Regarding instrumental activities of daily living 210 (67.7%) had dependency in preparing meal, followed by shopping 152 (49%). There was statistically significant association between age group, marital status, having source of income with level of basic dependency ( $p < 0.005$ ). Age group, sex, educational status, marital status, having source of income, currently living-with also showed statistically significant association with level of instrumental dependency ( $p < 0.005$ ).

**Conclusion:** One out of six elderly showed dependency in basic activities of daily living and more than one third showed dependency in instrumental activities of daily living.

**Keywords:** Activities of daily living; Dependence; Elderly.

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## INTRODUCTION

Globally, life expectancy at birth has increased from 66.5 years in 2000 to 73.5 years in 2025.<sup>1</sup> Percentage of elderly in Nepal has increased from 3.1% in 1972 to 5.9% in 2021.<sup>2</sup> Because of rising life expectancy and declining fertility rates,<sup>3</sup> proportion of elderly is rapidly expanding.

Human body undergoes numerous changes as we age, also aging is frequently associated with reduction in bodily functions,<sup>3</sup> which may leads to disabilities in Basic Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL).<sup>4</sup> ADLs are activities related to one's basic physical needs necessary for independent life including bathing, grooming, feeding. IADL includes more complex activities of independent living in community such as medication, food preparation, housekeeping, etc.<sup>5</sup> Globally, over 46% of elderly are having trouble carrying out daily tasks, over 250 million people are living with moderate to severe disabilities.<sup>6</sup>

Long-term institutional care is virtually non-existent in Nepal, and merely few facilities are available in urban Nepal. As family structures are shifting from expanded families to nuclear and migration of adult children are increasing,<sup>7</sup> these may have a significant impact on caregiving responsibilities of older persons. So, addressing this issue is very crucial and requires robust context specific data.

## METHODOLOGY

This descriptive community based cross-sectional study was conducted in ward no 2 & 3 of Changuarayan Municipality, Bhaktapur among elderly of age 65 years and above. The data was collected from Feb 2023-May 2023 after obtaining ethical clearance from Institutional Review Committee of Kathmandu Medical College (Ref.:23122022/02). Permission from Ward Chair persons of each ward was taken for the study. An informed consent was obtained from the participants and the objectives and purposes of the study were made clear. One or more elderly of aged 65 years and above from each household of selected wards were taken as sample unit. Elderly who couldn't respond to the questionnaires were excluded in the study. Convenient sampling method was done to reach sample size. A sample size of 310 was calculated by using the formula:  $N = Z^2pq/L^2$  with 95% level of confidence, and 5% margin of error, 28% prevalence of dependency in ADL.<sup>8</sup> Calculated sample size was 310 and we collected data from 310 participants. Data were collected via structured interview schedule. Researcher visited each household and clearly explained the purpose of data collection. Face to face interview was conducted using Nepali version questionnaire. Time for interview session was 15-20 minutes for each participant and 12-15 participants were interviewed each day. Questionnaire was divided into three parts. First part was about Socio-demographic information containing 10 items and the second part consisted

Katz index of independence in Basic activities of daily living<sup>9</sup>. It measures the adequacy of performance in the six domains; bathing, dressing, toileting, transferring, continence and feeding. Participants were scored 0 or 1 for independence in each six functions resulting total score of 6.

The Score was interpreted as  $\geq 5$  full function/mild impairment, 3-4 moderate impairment and  $\leq 2$  severe functional impairment. The third part of the questionnaire was Lawton- Brody Instrumental activities of daily living scale<sup>10</sup>. It measures adequacy of performance in 8 domains: telephone, doing laundry, handling finances, shopping, food preparation, housekeeping,

transportation and responsibility for own medication. Participants were scored 0 or 1 for independence in each domain resulting in total score of 8. To neutralize the influence of gender on interpretation, the score was interpreted as Independent = 4-5 and Dependent=0-3 for men and Independent= 6-8 and Dependent=0-5 for women. Pretesting was done among 31(10%) of sample size among elderly of ward no 1 in Changuarayan Municipality. Obtained data was checked for completeness, accuracy and appropriateness and analysed by using statistical package for social sciences, IBM SPSS Statistics for Windows version 21 (IBM Corp., Armonk, N.Y., USA). The descriptive statistics have been presented as frequencies, percentages, mean and standard deviations. Inferential statistics i.e, chi square was used to see association considering 95% confidence interval not crossing one as statistically significant.

## RESULTS

The mean age of elderly were  $74.58 \pm 8.227$  where more than half, 181 (58.4%) belonged to youngest old (65-75 years) age group similarly more than half 178 (57.4%) were female, 198 (63.9%) were illiterate, 196 (63.2%) were married and 241(77.7%) had source of income out of which 181(75.1%) received social allowance and 28 (11.6%) were involved in agricultural work. Majority of them 258 (83.2%) were currently living with family, two third of them, 205 (66.1%) currently had disease out of which 74 (36.1%) had hypertension (Table 1).

Prevalence of dependency in basic activities of daily living among elderly was 51 (16.5%) out of which 35 (11.3%) showed moderate impairment and only 16 (5.2%) disclosed severe impairment. Prevalence of dependency in instrumental activities of daily living was 122 (39.4%) out of which 34(11%) male elderly and 88 (28.4%) female elderly had dependency (Table 2).

Similarly, 105 (33.9%) elderly had dependency in continence, 51 (16.5%) in bathing, followed by five (1.6%) in transferring. Likewise, 210 (67.7%) had dependency in preparing meal, 152 (49%) in shopping, and least 60 (19.4%) had dependency in using means of transportation (Table 3).

There was highly significant statistical association between age group, marital status, having source of income and level of dependency in BADL ( $p < 0.005$ ) (Table 4). Similarly there was highly significant statistical association of age group, sex, educational status, marital status, having source of income and currently living-with and level of dependency in IADL among elderly ( $p < 0.005$ ) (Table 5).

**Table 1: Socio-demographic characteristics of elderly (n=310)**

Variable	n (%)
<b>Age group</b>	
65-75(youngest-old)	181(58.4)
75-85 (middle-old)	93 (30.0)
≥85 (oldest-old)	36 (11.6)
<b>Mean age 74.58+ 8.227</b>	
<b>Sex</b>	
Male	132 (42.6)
Female	178 (57.4)
<b>Educational status</b>	
Illiterate	198 (63.9)
Literate	112 (36.1)
<b>Marital status</b>	
Married	196 (63.2)
Widow	84 (27.1)
Widower	30 (9.7)
<b>Having source of income</b>	
Yes	241 (77.7)
No	69 (22.3)
<b>Type of sources (n=241)</b>	
Social allowance	181 (75.1)
Agriculture	28 (11.6)
Retired	16 (6.6)
Business	13 (5.4)
Labor	3 (1.2)
<b>Currently living with</b>	
With family	258 (83.2)
With spouse only	43 (13.9)
Alone	9 (2.9)
<b>Currently having disease</b>	
Yes	205 (66.1)
No	105 (33.9)
<b>Number of diseases (n=205)</b>	
One	125 (60.98)
More than one	80 (39.02)
<b>Types of disease</b>	
Hypertension	74 (36.1)
Hypertension with co-morbidity	73 (35.6)
Diabetes	13 (6.3)
COPD	12 (5.9)
Diabetes with co-morbidity	7 (3.4)
Others	26 (12.7)

**Table 2: Prevalence of dependency in BADLs and IADLs among elderly**

Dependency in BADLs	n (%)
<b>Independent (full function)</b>	259 (83.5)
<b>Dependent</b>	
Moderate impairment	35 (11.3)
Severe impairment	16 (5.2)
Dependency in IADLs	n (%)
<b>Independent</b>	
Male	98 (31.6)
Female	90 (29)
<b>Dependent</b>	
Male	34 (11)
Female	88 (28.4)

**Table 3: Distribution of dependency in each domain of BADLs and IADLs among elderly**

Variables	n (%)
<b>Basic dependency</b>	
Continence	105 (33.9)
Bathing	51 (16.5)
Dressing	49 (15.8)
Toileting	12 (3.9)
Feeding	11 (3.5)
Transferring	5 (1.6)
<b>Instrumental dependency</b>	
Preparing meals	210 (67.7)
Shopping	152 (49.0)
Keeping the home tidy	143 (46.1)
Washing own clothes	136 (43.9)
Using phone	98 (31.6)
Managing the money	94 (30.3)
Taking medications	81 (26.1)
Using means of transportation	60 (19.4)

**Table 4: Association of socio-demographic characteristics with level of dependency in BADLs among elderly**

Variables	Dependent	Independent	p value
<b>Age group</b>			
65-75(youngest-old)	2 (1.1)	179 (98.9)	≤0.001*
75-85 (middle-old)	24 (25.8)	69 (74.2)	
≥85 (oldest-old)	25 (69.4)	11 (30.6)	
<b>Sex</b>			
Male	27 (20.5)	105 (79.5)	0.121
Female	24 (13.5)	154 (86.5)	
<b>Educational status</b>			
Illiterate	37 (18.7)	161 (81.3)	0.202
Literate	14 (12.5)	98 (87.5)	

<b>Marital status</b>			
Married	14 (7.1)	182 (92.9)	≤0.001*
Widow/ Widower	37 (32.5)	77 (67.5)	
<b>Having source of income</b>			
Yes	50 (20.7)	191 (79.3)	≤0.001*
No	1 (1.4)	68 (98.6)	
<b>Currently living with</b>			
With family	47 (9.3)	211 (90.7)	0.122
With spouse only	4 (18.2)	39 (81.8)	
Alone	0 (0.0)	9 (100)	
<b>Currently having disease</b>			
Yes	31 (15.1)	174 (84.9)	0.419
No	20 (19)	85 (81)	

p-value significant ≤0.05, p-value highly significant ≤0.001\*=chi square test

**Table 5: Association of socio-demographic characteristics with level of dependency in IADLs among elderly**

Variable	Dependent	Independent	P value
<b>Age group</b>			
65-75(youngest-old)	38 (21)	143 (79)	≤0.001*
75-85 (middle-old)	50 (53.8)	43 (46.2)	
≥85 (oldest-old)	34 (94.4)	2 (5.6)	
<b>Sex</b>			
Male	34 (25.8)	98 (74.2)	≤0.001*
Female	88 (49.4)	90 (50.6)	
<b>Educational status</b>			
Illiterate	99 (50)	99 (50)	≤0.001*
Literate	23 (20.5)	89 (79.5)	
<b>Marital status</b>			
Married	50 (25.5)	146 (74.5)	≤0.001*
Widow/ Widower	72 (63.2)	42 (36.8)	
<b>Having source of income</b>			
Yes	108 (44.8)	133 (55.2)	≤0.001*
No	14 (20.3)	55 (79.7)	
<b>Currently living with</b>			
With family	118 (45.7)	140 (54.3)	≤0.001*
With spouse only	4 (9.3)	39 (90.7)	
Alone	0 (0.0)	9 (100)	
<b>Currently having disease</b>			
Yes	87 (42.4)	118 (57.6)	0.141
No	35 (33.3)	70 (66.7)	

p-value significant ≤0.05, p-value highly significant ≤0.001\*\*=chi square test

## DISCUSSION

Assessment of dependency in basic and instrumental activities of daily living is crucial for geriatric health care planning because it provides an overview of the common physical impairments among the elderly population and serves as a screening for functional impairment.

This study assessed the dependency in basic and instrumental activities of daily living among elderly. The mean age of the participants was 74.58±8.227 years and more than half 57.4% were female which is in line with the findings of another study carried out in Nepal (74.3 ± 8.7, 56.52%).<sup>11,12</sup>

This study revealed 16.5% of elderly were dependent in basic activities of daily living out of which 11.3% showed moderate impairment and 5.2% disclosed severe impairment. The prevalence of dependency in ADLs of our study is very low in comparison with previous studies conducted in Nepal (43.5%, 62.8%, 30%),<sup>11-13</sup> this might be because of difference in sample i.e. hospitalized elderly, rural area, etc. Our findings is in concordance with the results obtained in other studies done in Spain (11.3%)<sup>14</sup> and Korea (11.6%)<sup>15</sup>; this might be because of use of same assessment tools. On the other hand, studies conducted in Ethiopia (34.5%)<sup>16</sup>, Poland (36.85%)<sup>17</sup>, Northern India (43%, 44%)<sup>18-9</sup> and Ghana (55%)<sup>20</sup> showed higher percentages and studies carried out in Iraq (4.5%)<sup>21</sup> Nepal (8.3%)<sup>7</sup> showed lower percentages of dependency in ADL when compared to our study. In present study, out of total, 39% participants had dependency in continence, 16.5% had in bathing, 15.8% had in dressing and only 1.6% had dependency in transferring which is in line with the findings of study done in Nepal<sup>13</sup>, India<sup>4</sup> and Iraq<sup>21</sup> where highest percentage of dependency for ADLs was continence followed by bathing but is in contrast with the study findings of and Ethiopia<sup>16</sup> where highest percentage of dependency was bathing (10.2%) followed by toileting (6.4%).

In this study, 39.4% of elderly were dependent in instrumental activities of daily living. This prevalence of dependency in IADLs of our study was in concordance with the results obtained in the study conducted in Spain (35.1%).<sup>14</sup> On the other hand, studies conducted in Ethiopia (54.4%)<sup>16</sup>, Nepal (52%)<sup>13</sup>, India (51.7%)<sup>4</sup> and Poland (43.19%)<sup>17</sup> showed higher and Korea (21.6%)<sup>15</sup>, Iraq (10.8%)<sup>21</sup> showed lower percentages of dependency in IADL when compared to our study. Regarding the components of IADL, 67.7% had dependency in preparing meal, 49% in shopping, 31.6% in using phone, 30.3% in handling money and 26.1%

had dependency in taking medication in this study. This finding is in accordance with the study conducted in Iraq<sup>21</sup> having highest dependency in meal preparation (56.7%) followed by shopping (42.4%) but contradicted to the findings of studies carried out in Nepal<sup>13</sup> (taking medication), India<sup>4</sup> (handling money), Ethiopia<sup>16</sup> (using means of transportation), Spain<sup>14</sup> (keeping the home tidy).

In this study age group, marital status and having source of income shows highly significant statistical association with dependency level of BADL, results from other studies also reveal similar findings.<sup>14, 16, 18</sup> Similarly age group, sex, educational status, marital status, having source of income and currently living with shows highly significant association with level of dependency in IADL among elderly, results from other studies also reveal similar findings.<sup>4,16,21</sup>

## CONCLUSION

One out of six elderly showed dependency in basic activities of daily living and more than one third showed dependency in instrumental activities of daily living. These findings necessitate demand for assistance, supervision, and hands-on care for maintaining quality of life of elderly. Family members should provide proper care and supervision to the elderly members. It would be better if local government could provide day care centers for those elderly whose family members are busy or are abroad.

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