

ORIGINAL ARTICLE

A Study of Daily Living Dependency Status among Elderly in an Urban Slum area of Dehradun

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Abstract

Background: Population aging is observed world-wide. As per Census 2011, elderly constitutes 7.4% population of India. It is expected to increase to 20% in 2050. This segment of population faces multiple medical and psychological problems. To address and solve these problems great effort from the country and the community is required. **Objective:** To assess the daily living dependency status among elderly. **Method:** A cross sectional study was conducted in Dehradun, among 215 elderly people, using a pre-structured questionnaire. Their activities of daily living (ADL) and Instrumental activities of daily living (IADL) were recorded by observation and interviewing them with their families. **Results:** Out of total, 93% individuals were independent in their ADLs, with more dependence in the very old elderly. Maximum inability was found in Bathing and dressing. 70.7% elderly were dependent on one or more IADLs, female elderly being more dependent than male ($p < 0.05$). However there was no significant difference of dependence in the male and female elderly in performing ADLs. Education and socio-economic status had a positive effect on independence in IADLs. Among all IADLs male elderly showed a maximum dependency for cooking and laundry while females showed a greater dependency in using telephone, managing money and travelling.

Key Words

Elderly; ADL; IADL; Dependency

Introduction

Population aging is one of the most significant trends of the 21st century. It has important and far-reaching implications for all aspects of society. Around the world, two persons celebrate their sixtieth birthday every second [1]. Population ageing is a phenomenon that can no longer be ignored. It is both a celebration and challenge. By the year 2050, 80% of the elderly are expected to live in low-income and middle income countries [2]. The effect has begun to be felt in India, with around 90 million elderly at present [3]. By 2050, the number is expected to increase to 315 million, which

constitutes 20 per cent of the total population [4]. Physical state of body deteriorates with advancement of age leading to physical impairment as well as disability in long-term, which results in dependency on others. The challenge in the 21st century is to delay the onset of disability and ensure optimal quality of life for older people at family, community and national level. For aging to occur gracefully, it will require early investment and co-operation between health and social care.

Aims & Objectives

To study the socio-demographic distribution of elderly and to study the dependence of elderly in

relation to activities of daily living (ADL) and Instrumental activities of daily living (IADL).

Material and Methods

This cross-sectional study was conducted in the urban field practice area of Department of Community Medicine, SGRRIM&HS, Dehradun from a period of September 2012-November 2012. Study participants include persons aged 60 years and above, based on history. Out of population of 15504, 911(5.8%) were elderly people. Among all elderly people, 215 were studied, through house to house visit using systematic random sampling. Every fourth house with the aged person was contacted and information was collected on pre-designed and pre-tested schedules by personal interviews and taking information from their families. Daily dependency of the elderly was studied in relation to activities of daily living (ADL) and instrumental activities of daily living (IADL) using Katz and Lowton Broody scales respectively [5,6]. The subjects' performance was scored as one for each item performed independently and nil for not doing so.

As per the report by the Ministry of Statistics and Program Implementation, Govt. of India, about 65 per cent of the aged had to depend on others for their day-to-day maintenance [7]. Based on this the sample size of 215 was calculated by applying the formula, $n = Z^2 p (1-p) / d^2$ where, $p = 0.65$, $Z = 1.96$, (at 95% confidence limit), d is allowable error which is taken as 10%.

Modified BG Prasad Classification was used in assessment of socio-economic status. Latest available income ranges were taken [8,9]. The educational status of the sample population was classified as per the census of India-1991 [10] in categories: illiterate, just literate, primary, middle, higher secondary, graduate and above. The data so collected was tabulated and analyzed using SPSS version 20.0. Frequency distribution and cross analysis tables were prepared. Data was expressed in percentage and proportions. Chi-square (χ^2) test was used for evaluating association between ADL and IADL scores and categorical variables.

Results

Age and Sex Distribution: The median age of respondents was 68.7 years. Maximum number of elderly individuals were from 60-69 years age group 125 (58.2%) followed by 58(27%) in 70-79 years age group and 32 (14.8%) in age group 80+ years. The study population comprises of 113 (52.5%) females

and 102 (47.4%) males. Feminization of population was seen with sex ratio of 1107.

Literacy and Socio-economic Class: Out of 215 individuals, 127(59%) individuals were illiterate, 46% among males and 71% among females. Most of (68.8%) elderly individuals belonged to lower socio-economic class (Class IV and Class V).

Activities of Daily Living: It is evident from the [Table 1](#) that, majority (93%) of study participants were independent in their physical activities of daily living, while rest 7% were dependent on one or more activities, including a total dependence of 4.3%. Dependence being maximally contributed (53.3%) by those above 80 years with a dependence rate of 25%. This difference in dependency between early olds (60-69yrs) and older person aged 80 years and more was found to be statistically significant ($p < 0.05$). Dependence seems to be more in females (9.7%) compared to males (4%) but the difference was not statistically significant. There was no dependence in ADL activities in the higher education group. The dependence in the ADL status seems to be decreasing with the education of the person ($p > 0.05$). ADL dependency was more seen in Class I (11.8%) and those belonging to Class V (10.7%) were totally independent. This inverse relation between SES and Dependence was not found to be statistically significant ($p > 0.05$). [[Table 1](#)]

It is seen from [Table 2](#) that, inability was maximum in bathing and dressing (6.9%) and transfer about (6.04%) and minimum in feeding (4.18%). Inability for bathing was more in lower socio-economic Class (61.8%) (Class IV and V) as compared to higher SES (5% for Class I and II).

Instrumental Activities of Daily Living: It is evident from the [Table 3](#) that, 19.5% of study participants were totally dependent on others for all the IADLs, and 29.3% were totally independent. 70 % of study population was dependent on others for one or more instrumental activities of daily living. Total dependence for IADL was significantly higher in older age (80+ group) as compared to young old (<80 group) ($p < 0.05$). Male elderly were more (41.3%) independent than female elderly (16.8%) in performing IADL ($p < 0.001$). It is also evident from [Table 3](#) that 73.8% of IADL dependency was attributed by illiterate elderly ($p < 0.05$). Socio-economic status seems to have a positive effect on IADL dependency. Dependence was more in Class IV and V, as compared to higher socio-economic class ($p < 0.05$).

Among all IADL, preparing meal and using telephone were the most common IADL for dependency in both sex. Nearly half (47%) of male elderly were dependent on others for cooking and laundry. In all activities female elderly were found to be more dependent than male elderly except laundry ($p < 0.05$). Among all IADL, female elderly showed maximum dependence in using telephone (77.8%) followed by managing money (69%) and travelling (60%). [Table 4]

Discussion

Maximum elderly were aged 60-69 years and females in our study. Feminization of elderly population is also seen by NSSO 60th round report with sex ratio at 1028 [10] which is comparable to our study. Singh N *et al* also reported similar age sex distribution in their study [11].

Majority of elderly (93%) were totally independent in their ADL which is similar to finding of a study in rural area of Punjab (97%) [11]. Study conducted by Zhe Tang *et al* among Beijing Chinese elderly reported 4.3% ADL dependency [12]. Study conducted by Goel PK *et al* (2006) in rural area of Meerut reported 12.3% elderly to be dependent in one or more ADLs which is more than the present study but this could be due to the difference in the rural and urban setting. The study reported similar findings for dependence among male and female elderly [13].

ADL dependency was found significantly higher in elderly above 80 years which is similar to study carried out in Sweden by Sonn U *et al* [14]. Dependency in ADL was found more in lower socio-economic class as compared to higher socioeconomic class. This observation was also reported by two studies [13,15].

19.5% elderly in our study were totally dependent on IADL and 29.3% totally independent. Study carried by Goel PK *et al* found 19.7% total dependence in IADL but only 7.3% were independent in their study [13], higher independence in IADL in our study could be due to media exposure and urban influence on elderly. A study conducted by Zhe Tang *et al* among elderly Beijing Chinese [12] reported 7.9% disability in IADL which is lower than our study; it may be due to cultural differences between Indians and Chinese. Females are significantly more dependent in IADLs as compared to males. This may be due to the fact that females in this study are mostly house wives. Studies conducted by and Goel PK *et al* and Wataru Koyano *et al* also reported higher dependence in females

elderly than male elderly, in relation to IADLs with the exception of preparing meals [13,16].

Conclusion

Majority of elderly enjoyed independent and effective aging till the age of 79 years as far as ADLs are concerned. Dependence significantly increased after 80 years of age. The dependence however was more in IADL. Education and socio-economic status have a positive impact on dependency status.

Recommendation

Opportunities need to be provided for improving SES & access to health care. At national level: Effective implementation of National Policy of Older persons (NPOP) and National Program for the Health care of Elderly (NPHCE) is required. Extension of social pension and health insurance or incentivized physiotherapy and health facility especially to elderly women may be done. At community level: greater participation of elderly needs to be ensured. At Family level: stronger inter-generational bonding and joint family system needs to be encouraged. Further larger studies must be planned to find the issues related to ADL and IADL at country level. Some interventions can be suggested as per finding. Example for laundry issue some washing machine/laundry incentive may be provided to the elderly by govt. For difficulty in telephone usage, provision of hand free devices, bigger font size, new techniques keeping the elderly in mind. There is an emerging need to pay greater attention to ageing-related issues and to promote holistic policies and programs for dealing with the aging society.

Limitation of the study

Other parameters of geriatric age could be taken like nutritional status and morbidities in elderly.

Relevance of the study

ADL, IADL dependency and morbidities in elderly are increasing due to better life expectancy. Thus there is dire need to strengthen NPHCE.

Authors Contribution

PO: critical analysis and necessary correction in the manuscript, SKG: facilitation and final approval of the manuscript, NU: collection, analysis of data and manuscript writing.

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Tables

TABLE 1 DISTRIBUTION OF PHYSICAL ACTIVITIES OF DAILY LIVING (ADL) BY SOCIO-DEMOGRAPHIC PROFILE

| Activity score | | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|--------------------|-------------------|----------|---------|---------|----------|---------|---------------------|
| Age | Age group (n) | Tot. Dep. No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | No. (%) | Tot. Indep. No. (%) |
| | 60-69yrs (125) | 3 (2.4) | 1(0.8) | 0(0) | 0(0) | 0(0) | 0(0) | 121 (96.8) |
| | 70-79yrs (58) | 1(1.7) | 0(0) | 0(0) | 0(0) | 1(1.7) | 1(1.7) | 55(94.8) |
| | 80+yrs(32) | 5(15.6) | 0(0) | 3(9.4) | 0(0) | 0(0) | 0(0) | 24 (75) |
| χ^2 (60-79 vs. 80+)= 18.8, df=1, p<.001 | | | | | | | | |
| Sex | F(113) | 7(6.2) | 1(0.9) | 2(1.8) | 0(0) | 1(0.9) | 0 (0) | 102(90.3) |
| | M (102) | 2(1.8) | 0(0) | 1(0.9) | 0(0) | 0(0) | 1(0.9) | 98(96) |
| | Total(215) | 9 (4.18) | 1 (0.46) | 3(1.3) | 0 (0) | 1 (0.46) | 1(0.46) | 200 (93) |
| χ^2 (M vs. F)= 0.337, df= 1, p >0.05 | | | | | | | | |
| Education | Illiterate (127) | 5 (3.9) | 1(0.7) | 2 (1.4) | 0(0) | 1(0.7) | 1(0.7) | 117 (92.1) |
| | Just literate (29) | 1(3.4) | 0(0) | 1 (3.4) | 0(0) | 0(0) | 0(0) | 27 (93.1) |
| | Primary (25) | 2(8) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 23 (92) |
| | Middle (10) | 1(10) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 9 (90) |
| | Higher sec. (16) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 16 (100) |
| | Grad. &> (8) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 8 (100) |
| χ^2 (ill. Vs lit.)=0.385, df =1, p>0.05 | | | | | | | | |
| SES | Class I (17) | 1 (5.9) | 0(0) | 1(5.8) | 0(0) | 0(0) | 0(0) | 15 (88.2) |
| | Class II (40) | 3 (7.5) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 37 (92.5) |
| | Class III (91) | 2 (2.2) | 1(1.1) | 0(0) | 0(0) | 1(1.1) | 0(0) | 87 (91) |
| | Class IV (56) | 3 (5.4) | 0(0) | 2(3.6) | 0(0) | 0(0) | 1(1.8) | 50 (89.3) |
| | Class V (11) | 0 (0) | 0 (0) | 0(0) | 0 (0) | 0(0) | 0 (0) | 11 (100) |
| χ^2 (SES)=4.389, df =4, p>0.05 | | | | | | | | |

TABLE 2 INABILITY OF SPECIFIC PHYSICAL ACTIVITIES OF DAILY LIVING (ADL) ACCORDING TO SOCIO-DEMOGRAPHIC PROFILE

| Characteristics | | Bathing n (%) | Dressing n (%) | Feeding n (%) | Toilet n (%) | Continence n (%) | Transfer (Moving about) n (%) |
|------------------|---------------------|---------------|----------------|---------------|--------------|------------------|-------------------------------|
| Age | 60-69 yrs (125) | 4(3.2) | 4(3.2) | 3(2.4) | 4(3.2) | 4(3.2) | 4(3.2) |
| | 70-79 yrs (58) | 3(5.2) | 2(3.4) | 1(1.7) | 1(1.7) | 1(1.7) | 1(1.7) |
| | 80+yrs(32) | 8(25) | 8(25) | 5(15.6) | 6(18.8) | 6(18.8) | 8(25) |
| Sex | F(113) | 11 (9.7) | 11 (9.7) | 7(6.19) | 9 (7.9) | 9 (7.9) | 10(8.8) |
| | M(102) | 4 (3.9) | 3 (2.9) | 2 (1.96) | 3 (2.9) | 2 (1.96) | 3(2.9) |
| Education | Illiterate (127) | 10 (7.8) | 9(7) | 5 (3.9) | 7 (5.5) | 7 (5.5) | 8 (6.3) |
| | Just literate (29) | 2(6.9) | 2 (6.9) | 1 (3.4) | 2 (6.9) | 1 (3.4) | 2 (6.9) |
| | Primary (25) | 2 (8) | 2 (8) | 2 (8) | 2 (8) | 2 (8) | 2 (8) |
| | Middle (10) | 1 (10) | 1 (10) | 1 (10) | 1 (10) | 1 (10) | 1 (10) |
| | Higher sec. (16) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| | Grad. And above (8) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| SES | Class I (17) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |
| | Class II (40) | 2 (5) | 2 (5) | 1 (2.5) | 2 (5) | 1 (2.5) | 2 (5) |
| | Class III (91) | 3 (3.3) | 3 (3.3) | 3 (3.3) | 3 (3.3) | 3 (3.3) | 3 (3.3) |
| | Class IV (56) | 4 (7.14) | 4 (7.14) | 2 (3.6) | 3 (5.4) | 3 (5.4) | 3 (5.4) |
| | Class V (11) | 6 (54.5) | 5 (45.4) | 3 (27.3) | 4 (36.4) | 4 (36.4) | 5 (38.5) |
| Total | | 15(6.9) | 14(6.5) | 9 (4.18) | 12(5.6) | 11 (5.1) | (6.04) |

TABLE 3 DISTRIBUTION OF INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADLS) BY SOCIO-DEMOGRAPHIC PROFILE

| Demographic characteristics | Activity scores | 0 totally Dependent | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 totally Independent |
|-----------------------------|--------------------|---------------------|----------|----------|---------|---------|--------|----------|----------|-----------------------|
| Age | 60-69y (125) | 14(11.2) | 8 (6.4) | 9(7.2) | 6(4.8) | 5 (4) | 3(2.4) | 14(11.2) | 18(14.4) | 48(38.5) |
| | 70-79y (58) | 9 (15.5) | 9 (15.5) | 6(10.3) | 5(8.6) | 2(3.4) | 2(3.4) | 4(6.8) | 9(15.5) | 12(20.6) |
| | 80+y (32) | 19 (59.3) | 3 (15.7) | 0(0) | 1(5.3) | 2(10.6) | 1(5.3) | 1(5.3) | 2(10.6) | 3(9.3) |
| Sex | F (113) | 30(26.5) | 16(14.1) | 14(12.4) | 7(6.2) | 2(1.8) | 4(3.5) | 10(8.9) | 11(9.7) | 19(16.8) |
| | M (102) | 12(11.7) | 4 (3.9) | 1(0.8) | 5(4.9) | 7(6.9) | 2(2) | 9(8.8) | 18(17.6) | 44(43.1) |
| Education | Illiterate (127) | 31(24.4) | 15(11.8) | 13(10.2) | 5(3.9) | 5(3.9) | 3(2.4) | 11(8.7) | 16(12.6) | 28 (22) |
| | Just literate (29) | 4 (13.8) | 5(17.2) | 2(6.9) | 5(17.2) | 1(3.4) | 1(3.4) | 1(3.4) | 4(13.8) | 6 (20.7) |
| | Primary(25) | 6 (24) | 0(0) | 0(0) | 1(4) | 1(4) | 1(4) | 2(8) | 3(12) | 11 (44) |
| | Middle (10) | 1 (10) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 4(40) | 2(20) | 3 (30) |
| | Higher sec(16) | 0 (0) | 0(0) | 0(0) | 1(6.3) | 2(12.6) | 1(6.3) | 1(6.3) | 2(12.6) | 9 (56.3) |
| | Grad.&>(8) | 0 (0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 2(25) | 6 (75) |
| SES | Class I (11) | 1(9) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 3(27.3) | 7 (63.6) |
| | Class II (17) | 3(17.6) | 1(5.9) | 1(5.9) | 1(5.9) | 0(0) | 0(0) | 1(5.9) | 2(11.8) | 8 (47.1) |
| | Class III (40) | 5(12.5) | 3(7.5) | 3(7.5) | 4(10) | 3(7.5) | 3(7.5) | 2(5) | 7(17.5) | 10 (25) |
| | Class IV(91) | 17(18.6) | 11(12.1) | 7(7.7) | 2(2.2) | 6(6.6) | 3(3.3) | 13(14.3) | 11(12.1) | 21 (23.1) |
| | Class V(56) | 16(28.5) | 5(8.9) | 4(7.1) | 5(8.9) | 0(0) | 0(0) | 3(5.4) | 6(10.7) | 17 (30.4) |
| Total (215) | | 42(19.5) | 20 (9.3) | 15(7) | 12(5.6) | 9(4.2) | 6(2.8) | 19(8.8) | 29(13.5) | 63 (29.3) |

 χ^2 (60-79 vs. 80+) = 7.486, df=1, $p < 0.05$, χ^2 (F vs. M) = 16.539, df=1, $p < 0.001$, χ^2 (lit vs. illit.) = 8.846, df=1, $p < 0.05$, χ^2 (SES) = 10.272, df=4, $p < 0.05$

TABLE 4 INABILITY OF SPECIFIC IADLS BY SOCIO-DEMOGRAPHIC PROFILE

| Socio-demographic factors | | Using telephone | Travelling | Shopping | Preparing meals | House work | Taking Medicines | Managing money | Laundry |
|---------------------------|-----------------|-----------------|------------|----------|-----------------|------------|------------------|----------------|-----------|
| Age (Years) | 60-69(125) | 57(45.6) | 37(29.6) | 27(21.6) | 52(41.6) | 37(29.6) | 26(20.8) | 48(38.4) | 39(31.2) |
| | 70-79(58) | 31(53.4) | 27(46.6) | 22(37.9) | 35(60.3) | 28(48.3) | 14(24.1) | 31(53.4) | 39(67.2) |
| | >80(32) | 26(81.3) | 22(68.8) | 22(68.8) | 28(87.5) | 23(71.9) | 20(62.5) | 25(78.10) | 27(84.4) |
| P-value | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Sex | F(113) | 88(77.8) | 68(60) | 54(47.8) | 67(59.2) | 64(56.6) | 44(39) | 78(69) | 58(51.3) |
| | M(102) | 26(25.4) | 18(17.6) | 17(16.6) | 48(47) | 24(23.5) | 16(15.6) | 26(25.2) | 47(46) |
| P (F vs. M) | | <.001 | <.001 | <.001 | >.05 | <.001 | <.001 | <.001 | >.05 |
| Education | Illit.(127) | 85(66.9) | 62(48.8) | 51(40) | 78(61.4) | 62(48.8) | 47(37) | 74(58.2) | 64(50.3) |
| | Just lit.(29) | 18(62) | 16(55.1) | 12(41.3) | 16(55.1) | 15(51.7) | 5(17.2) | 19(65.5) | 16(55) |
| | Primary(25) | 9(36) | 7(28) | 6(24) | 10(60) | 7(28) | 7(28) | 8(32) | 13(52) |
| | Middle(10) | 1(10) | 1(10) | 1(10) | 6(60) | 1(10) | 1(10) | 2(20) | 5(50) |
| | Higher sec.(16) | 1(6.2) | 0(0) | 1(6.25) | 5(31.2) | 3(18.7) | 0(0) | 1(6.2) | 5(31.2) |
| | Grad. (8) | 0 (0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 0(0) | 2(25) |
| P (lit vs. illit.) | | <0.001 | <0.05 | <0.05 | <0.05 | <0.05 | <.001 | <.001 | >0.05 |
| SES | Class I(11) | 2(18.1) | 1(9) | 1(9) | 2(18) | 1(9) | 1(9) | 1(9) | 2(18.1) |
| | Class II(17) | 6(35.2) | 4(23.5) | 4(23.5) | 7(41.1) | 5(29.4) | 5(29.4) | 6(35.2) | 9(52.9) |
| | Class III(40) | 20(50) | 15(37.5) | 12(30) | 21 (52.5) | 13(14.8) | 7(11.7) | 20(19.2) | 20(19) |
| | Class IV(91) | 52(57) | 37(40.6) | 32(35.1) | 54(59.3) | 41(45) | 25(27.4) | 48(52.7) | 45(49.4) |
| | Class V(56) | 34(60.7) | 29(51.7) | 22(39.2) | 31(55.3) | 28(50) | 22(39.2) | 29(51.7) | 29(51.7) |
| P (SES) | | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | >0.05 |
| Total(215) | | 114(53) | 86(40) | 71(33) | 115(53.4) | 88(40) | 60(28) | 104(48.3) | 105(48.8) |