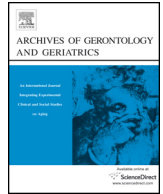




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Predictors of functional disability with focus on activities of daily living: A community based follow-up study in older adults in India



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ABSTRACT

Background: Disability in activities of daily living is a growing concern among older populations all over the world. India has one of the rapidly ageing populations and predicted burden of functional disability is higher for Indian older adults as compared to other ageing Asian countries.

Methods: Total 1140 aged 60 years and over participated in a baseline study. 560 of them participated in the prospective cohort study conducted in the city of Pune, India. An interview and functional assessment using a questionnaire and Pune-FAAT tool was carried out in 2013–14. Binary logistic regression was used to obtain the factors that increased the odds of having ADL disability at follow-up.

Results: The mean age of the study population was 69.73 ± 5.48 years. Squatting, walking and climbing functions were affected significantly. Total 376 participants (67.1%) reported difficulties and/or disability in performing activities of daily living (ADL) at follow-up. Hospitalization (OR = 3.6; 95% CI: 1.9–6.7), being female (OR = 2.3; 95% CI: 1.5–3.5), presence of two or more chronic diseases (OR = 1.7; 95% CI: 1.1–2.7), experience of memory loss (OR = 1.9; 95% CI: 1.2–3.0) and feeling of loneliness (OR = 2.3; 95% CI: 1.0–5.3) increased the odds of being in the “With disability” group at follow-up. Apart from this, self-rated health and self-reported depression were associated with limitations in ADL.

Conclusion: Hospitalization and being female appeared to be the most significant risk factors for disability in urban older adults in India. Rehabilitation services after hospitalization, physical exercise, effective control on chronic illness, and social participation to reduce loneliness is recommended.

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1. Introduction

Functional capacity is the possibility and ability to carry out the daily activities in a normal or accepted way, which declines as age advances (Millán-Calenti et al., 2010). A state in which an older adult experiences deficits, limitations in these activities and restrictions in his/her social participation is called disability (WHO, 2001). Exceptional gains in life expectancy in both developed and developing countries has resulted in the growth of the sixty-plus population who are likely to be nearly two billion by 2050 (UNDESA, 2013). Functional ability is a growing concern for this sixty-plus population and disability is one of the most important determinants of health and quality of life of older adults (Äijänseppä et al., 2005).

Prevalence of functional disability among older adults varies across the regions of the world. Asian countries report a wide range of disability; as low as 6.6% in Singapore, 8.1% in China, 13–21% in

Korea, 24.7% in Malaysia, and a whopping 34.7% prevalence in rural India (Hairi, Bulgiba, Cumming, Naganathan, & Mudra, 2010; Kim, 2011; Liu, Chi, Chen, Song, & Zheng, 2009; Ng, Niti, Chiam, & Kua, 2006; Sharma, Parashar, & Mazta, 2014).

Changes in activities of daily living (ADL) and instrumental activities of daily living (IADL) are used to predict disability (Sjölund, Wimo, Qiu, Engström, & von Strauss, 2014) and mortality (Millán-Calenti et al., 2010), globally. Difficulties faced in ADL have negative outcomes on the quality of life of older adults (Fried and Guralnik, 1997; Sidik, Rampal, & Affi, 2004). However, data on functional disability among older adults from the Indian subcontinent is limited (Agrawal, 2016) and mostly from the cross-sectional studies. An in-depth understanding of the factors that leads to functional decline in Asian context is necessary. Such understanding is necessary to plan disability prevention interventions. A major longitudinal study in India has come out with very promising results but is limited to specific variables (Arokiasamy and Jain, 2015). The present paper is based on a results of a cohort study. The aim of this paper is to discuss the likely predictors of the functional decline with specific reference to ADL in older adults in India.

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2. Methods

This is an analysis from an observational, prospective, study carried out by the researchers from the Savitribai Phule Pune University, School of Health Sciences in the year 2011–12 and follow up study in the year 2013–14. The study was carried out in the city of Pune, located in the Western parts of India and is very well represented by the population of India. The ethics committee of the University has approved the study.

2.1. Population and sample

The original study consisted of baseline data of total 1140 older adults aged 60 years and above. The sample in the original study was drawn using a stratified random sampling method. Out of fourteen administrative wards in the city of Pune (Maharashtra) eleven wards were selected and one sub-ward from these administrative ward selected randomly. Data was collected starting from northeast corner of each sub-ward. Respondents were selected randomly from each sub ward using population proportion sampling technique. The response rate in the original study was 81.9 percent. This baseline data was collected in the year of 2011–12. Because of the resource constraints, we decided to cover 50% of the population in the follow-up study. Remaining 50% will be contacted later. Assuming the high rate of non-respondent, we approached 709 participants in the year 2013–14, of whom, 560 participants (response rate 79%) completed the follow-up interview. Remaining could not be included because of death (63), inability to complete the survey due to critical illness (24) could not be contacted despite repeated efforts (39) and refusal (23) during follow-up after 24 months.

2.2. Tools

Pretested, semi-structured questionnaire was used to collect data on changes in socio-demographic profile, current health status etc. Pune-Functional Ability Assessment Tool (Pune-FAAT) was used to record the changes in the ability to perform the tasks of daily living. The tool has been validated previously (Nagarkar, Gadhave, & Kulkarni, 2014). The Pune –FAAT has 14 items like lifting, walking, climbing, arising from bed/chair, toilet use, dressing, self-cleaning, eating. It also includes squatting and bending as context specific items. Squatting and bending were necessary to include as most of the activities have been carried out at the ground level, in India. In addition, 4 IADL items are also part of Pune –FAAT scale. IADL activities included four items; participation in domestic chores, outside work, use of public transport and social participation. FAAT index is computed by dividing the raw score by number of items answered. Low score indicated no decline in functions while higher score indicated inability to perform tasks on the four-point scale.

2.3. Follow-up data collection

Participants of the original study were contacted 24 months after baseline data collection. A complete set of demographic, health and social activities related data was obtained only after obtaining informed consent from these participants. Information was collected about age, economic activity, functional ability in performing ADL and IADL using the Pune-FAAT scale. Self-reported mental well-being, and social participation, health status data including perceived health status, newly detected chronic illness, history of fall, injury, surgery, hospitalization, changes in marital status, family type and other social parameters were also noted. The primary endpoint was functional status, especially ADL and IADL as observed at the twenty-four months follow-up.

2.4. Description of dependent variable

Scores obtained at baseline and follow-up by using Pune-FAAT scale were compared and later on used to classify the population into two categories; 'With disability at follow-up' and 'Without disability at follow-up'. Researchers decided to use only ADL scores at this point of time because no significant changes observed in IADL activity score. ADL scores declined substantially in almost all ADL items. Greater decline from baseline to follow up was observed. Ability to perform task without any difficulty for squatting (55.5%–44.3%), bending (59.1%–48.4%), walking (62.5%–54.9%) and climbing (56.8%–46.3%) showed significant decline. Other ADL items, too, showed decline in the scores. Nearly 73 percent of the respondents at the baseline and 73.6 percent at follow up were unable to perform IADL tasks. Therefore, the present paper deals only with ADL activities and changes therein.

2.5. Statistical analysis

Basic characteristics of the study population were obtained by calculating frequencies. The above-mentioned categories of dependent variables were tested for socio-demographic, health-related, psychosocial factors and significance was observed using Chi-square test. Factors that were significantly associated ($p < 0.05$) with ADL disability in the univariate analysis were then pulled together in the regression model. Force entered binary logistic regression was used to obtain factors that increased the odds being in the "With disability at follow-up" category. "Without disability at follow-up" was kept as a reference category. Independent factors included in the final model were sex, history of surgery in last year (hospitalization), number of chronic diseases, self-reported health status, experience of memory loss, self reported feeling of loneliness and depression. Data analysis was carried out using Statistical Package for Social Sciences (SPSS; Version 19.0).

3. Results

3.1. Characteristics of the study population

Characteristics of the study population at baseline and follow-up did not show considerable change. The mean age of the study population was 69.73 ± 5.48 (range: 60–90 years). The study population included 51.2% of women and 48.8% of men. This distribution was nearly same as the baseline population. The majority of the population was married at both baseline (74.8%) and follow-up (72.3%). Other than married category (25.1%) included widowed/separated/unmarried individuals, this showed an increase by 2 points (27.6%) at the follow-up. A shift was observed in the case of presence of chronic illnesses; 38.8% reported one chronic illness and 10% reported 2 chronic illnesses at baseline. After 2 years, 25% reported one chronic illness and 32% reported presence of two chronic illnesses. In the follow up study forty-eight individuals (8.6%) recorded presence of three or more chronic diseases while at baseline none of the participant reported three chronic illnesses. Nearly one fourth (24.2%) reported surgery in two years prior to the survey. Inability to perform at least one ADL was 63% at the baseline, which was elevated to 67.3% at the follow-up.

3.2. Factors associated with ADL disability

The two categories of dependent variable in this analysis were (a) 'With disability at follow-up' was recorded by 376 respondents (67.1%), (b) 'Without disability at follow-up' as reported by 184

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