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## Fall risk among urban community older persons

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**Abstract.** The elderly should be screened in the community for risk for falls. It impacts significantly on their ability to still be active and productive even during aging. This study determined the risk for falls among Philippine urban community-dwellers 65 years old and above. Participants were ambulatory elderly people registered in a government centre in one city. Data collection was done by interviewing elders and assessing fall risk factors. Data analyses were done using descriptive statistics and SPSS version 16 was used to correlate variables. Fall risk predictive factor is age. 63.3% of the participants are categorized as young-old to middle old. Protective factor fall risk is being married and/or living with family, which is 65.3% of this group. Confidence level in performance and completion of tasks were measured by Activity-Based Confidence (ABC), which showed 71.5% has moderate level of confidence. However, confidence level is insufficiently-proven by literature to predict falls. Depression is statistically significant related factor for falls and was measured by Geriatric Depression Scale (GDS). Results showed that 87.7% has mild depression. Functional mobility capacity of the participants, namely balance and gait, and flexibility were measured by Tinetti Balance and Gait Scores (TBGS) and Chair Sit-and-Reach Test (CSRT), respectively. TBGS yielded 46.9%, and CSRT yielded 67.3%, which is low risk for falls. Correlation between TBGS and GDS, and TBGS and ABC were arrived at by using Spearman Rho. It yielded a significant relationship ( $r = 0.358$ ,  $p = 0.012$ ) between balance and gait with a depressive state, and no significant relationship ( $r = -0.136$ ,  $p = 0.352$ ) between balance and gait with confidence level, respectively.

**Key words:** Fall risk, older persons, functional mobility.

### Introduction

The Philippines now has an aging population, with 4.3% of its 92,337,852 population (Philippine Statistical Yearbook, 2011) comprising the 65 years and above age group. This trend resulted from years of improvements in modern science and advancement in technology, development in the health care delivery system, and incorporation of healthy lifestyle programs. As cited in the CIA World Factbook in January 2012, Filipino males have a life expectancy of 68.72 years, while females have 74.74 years.

There is a dearth of community-based programs that would answer the needs of the older segment of the population. For the older person, the age-related decline in balance, flexibility, muscular strength, bone density, osteoporosis, and problems with gait highly correlate with decreased functional mobility in the home that leads to incidences of falls, a general decline for independent living, and thus, decreased quality of life. Globally, falls among older persons occur at least once a year for almost one third of the older adult population (Means et al., 2005; Shin et al., 2009). And generally, that rate increases as the older person advances in age. In the US, the annual percentage of falls among people older than 65 years of age living in the community is between 30 to 40%. The incidence of falls rises steadily from middle age and peaks in persons older than 80 years (Rubenstein & Josephson, 2006). In the Philippines, falls and fall-related incidences have not been documented well. There were no studies about their risk of falling, either. But the impact of falls experienced by the older person is the beginning of the decline in functional capacity and marks the decrease in the performance of his or her activities of daily living.

This study focuses on older persons, men and women who are 65 years old and above and who are still able to ambulate whether with or without the assistance of a person or a device. According to Morgan & Kunkel (2001), older persons categorized as young-old (55 to 64 years), middle-old (65 to 74 years), or old-old 75 years and above). The age subgroups of middle-old and old-old will benefit from this study, especially since prevention of falls in these age subgroups can allow them to enjoy living independently for a longer period of time.

### **Materials and Methods**

This study utilized a quantitative descriptive design to assess the risk for falls among urban community-dwellers who are senior citizens visiting the Department of Social Welfare and Development District V office in the City of Manila. There were 49 older adults whose ages range from 65 to 89 years old, with four (4) males and forty-five (45) females.

The study instruments for used for the participants are divided into 1) screening exams to assess the participants' cognitive functions and exclude dementia, thus the use of the Mini-Mental State Examination (MMSE). A mixture of two (2) subjective tools, the Geriatric Depression Scale (GDS) and Activity-based Balance Confidence Scale (ABC), and three (3) objective functional mobility tools for assesment of fall risk, namely, Tinetti Balance and Gait Test (TBGS), 5-Minute Walk, and the Chair Sit-and-Reach Test (CSRT). Mini-Mental State Examination (MMSE) is a screening tool used to help detect assess the cognitive function of an individual and hence detect possible presence of dementia. Scoring and interpretation of the scores will be based on the interpretation method also provided in the form.

Geriatric Depression Scale is a test to determine if the person is depressed which is common among the participants. The Geriatric Depression Scale (GDS), first created by Yesavage et al., has been tested and used extensively with the older population. A depression test was the first among the screening tools since the level of cooperation would be one of the determinants to compliance and reliable performance of the study program. The test consisted of 30 questions. Participants were asked to respond to the questions by answering "yes" or "no" in reference to how they felt on the day of administration. Scores of 0 - 9 are considered normal, 10 - 19 indicate mild depression and 20 -30 indicate severe depression.

The Activity-based Balance Confidence Scale assessed the capability of an elderly individual to perform specific and particular tasks as part of his or her day-to-day activities with utmost satisfaction and confidence. For each of the items included in the tool, the elderly individual will indicate his or her level of confidence in performing a single task given within a range of percentage by tens. The number of items was summed up and divided by the number of the items, giving the primary average of that individual for this particular test. It was interpreted as follows: 80% gives high level of physical functioning, 50 to 80% provides a moderate level while <50% attains a low level of physical functioning. On a particular side note, <67% provides enough assumption that the individual is at a higher risk of falling in the near future with regards to his daily activities.

The 5-minute walk screening tool was used to determine the cardiovascular endurance and capacity of the participant. The person walked in a free space for 5 minutes as fast as possible. The distance in feet was the measure of this test. The Tinetti Balance and Gait Assessment tool is a simple, quick and reliable test of administration to determine the elderly individual's gait and balance performance. The tool consisted of 9 items for balance and 7 items for gait. Each item specified a minimum and maximum score. The balance component has a maximum score of 12 points while the gait has a maximum score of 16, with a grand total of 28 points. The individuals with a score below 19 were considered to be high risk for falls. While those who score within 19 to 24, this indicated that they were at slight risk. The Chair-Sit-and-Reach is performance test that assessed lower body flexibility of the participant, which is important for good posture, normal gait patterns and for various mobility tasks, such as getting in and out of a car.

A letter asking for permission to conduct the study was sent to the DSWD District V Office. Individual consent forms were given to the respondents and explained by the investigator. They were instructed to bring home these consent forms to their families. An adult member of the family should also sign the consent form as witness after the older person signed it. The survey-questionnaire procedure of data collection was carried out to ensure rapid and complete data collection.

Twelve nursing students were assigned to interview the older adults first to get their demographic profiles, after which the investigator and a research assistant who is also a nurse administered the six (6) standardized tests. The forms were answered by the interviewers since having the respondents write their answers would take longer. The investigator deemed it necessary to have a medication checklist for each respondent which was filled out by the investigator and the research assistant to assess and take note of multiple-drug exposure, and relate it with the tendency of the older person to fall.

All statistical analyses were performed using the SPSS (Statistical Package for the Social Sciences) software version 16. Descriptive statistics were computed to determine the frequency and percentage of the profile of the respondents, Tinetti Balance and Gait, Chair Sit-and-Reach Test Activity-Based Confidence Scale, and Geriatric Depression Scale. Spearman's Rank-Order Correlation Rho was used to determine the existence of relationships between functional mobility (balance, gait, flexibility) and Activity-Based Confidence Scale/Geriatric Depression Scale.

### **Results and Discussion**

There were 49 older persons who participated in the study. Of the 49 individuals, majority are females (91.8%) with a greater percentage (63.3%) in the young-old and middle-old categories, falling in the ages between 60 and 74. Over one-third (36.8%) is in the old-old category, with ages from 75 to 84, and 85 and beyond. Age of the older person has been known to be predictive of risk for fall since frailty is viewed as an age-related concept (Runge and Hunter, 2006). A greater percentage (65.3%) are married and living with their own families, while one-third (34.7%) are single (20.4%) and Widowed/separated (14.3%). In a systematic review of social and demographic predisposing characteristics among elderly

who have suffered from falls, being married is “protective against falling” (Bloch et al, 2010). A larger percentage (71.5%), almost two-thirds of the older persons group has moderate level confidence in the performance and completion of a task. The confidence level somehow alters balance and gait with some people (Kloseck, 2008), but there are insufficient studies that show that confidence level is predictive of the risk for fall.

A large majority (87.8%) of the older persons who participated had Mild Depression. Several studies done about the relationship of falls and depression show that moderate to severe depression is a statistically significant risk factor and predictor of falls (Biderman, 2002; Kim, 2009; Choi and Lee, 2010). Problems with balance and gait are predictive factors in the risk for falls (Lamoth, 2011), and both scores in balance and gait needed to be quantified to be able to identify levels of risks. The older persons in this group have low risk for falls. Lower body or hamstring flexibility can be tested by Chair Sit-and-Reach Test. The lack of it, especially in the older persons, has been associated with low back pain, gait limitations, and risk for falling (Jones et al, 1998; Jones and Rikli, 2002). The result in terms of flexibility validates the previous result related to the fall risk of this group.

Table 1. Relationships between Functional Mobility (Balance and Gait) and the following variables

Variable		Statistic	P
Geriatric Depression Scale (GDS)	Spearman rho	.358	0.012
Activity Balance Confidence Scale (ABC)	Spearman rho	-.136	0.352

There is a significant relationship between Functional Mobility (balance and gait) and Geriatric Depression Scale ( $r = .358$ ,  $p = 0.012$ ) because moderate to severe depression alters our locomotion and our attention. There is no significant relationship between Functional Mobility (balance and gait) and ABC ( $r = -.136$ ,  $p = 0.352$ ). Confidence is a personality manifestation that involves attention to the task (Klosec et al, 2002).

Table 2. Relationships between Functional Mobility (Flexibility) and the following variables.

Variable		Statistic	P
Geriatric Depression Scale	Chi square	1.55	0.460
Activity Balance Confidence Scale	Chi square	.093	0.954

There is no significant relationship between flexibility and GDS ( $\chi^2 = 1.55$ ,  $p > .05$ ). There is insufficient data or studies done on flexibility. One study by Biderman et al, 2002 showed only that depression and functional status play important parts in predicting falls but to relate GDS with ABC is difficult to find. There is no significant relationship between

flexibility and ABC ( $\chi^2 = .093$ ,  $p > .05$ ). If there is a lack of studies about flexibility and depression, then it the same with studies relating flexibility and confidence in performing a task.

### **Conclusions**

The group of older persons in the study belong the young to middle-old. Age of the older person has been known to be predictive of risk for fall, but since majority belongs to the younger set of the older persons' population, therefore they are at low risk for falls. And that most participants are married and living with their own families validates the research finding that the group has low risk for falls. Functional mobility in terms of balance, gait, and flexibility, the group is also low risk because most of these older persons walk daily to their destination be it the church or the DSWD office.

Therefore, continuation of the participants' physical activity levels but in a structured community-based exercise program is strongly recommended so that their low risk on this initial assessment would further be decreased or even eliminated. A nurse-led, structured exercise program can be developed and offered three times a week for at least thirty minutes to enhance further this group's balance, gait, flexibility, and strength. Later on, a leader among the participants may be identified to continue the program. This way we would have uplifted these individuals' functional mobility and contributed in the improvement of their quality of life.

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### **References**

- Biderman, A., Cwikel, J., Fried, A., & Galinsky D. Depression And Falls Among Community Dwelling Elderly People: A Search For Common Risk Factors. *J Epidemiol Community Health* 2002; 56:631-636.
- Bloch, F. et al (2010). Episodes Of Falling Among Elderly People: A Systematic Review And Meta-Analysis Of Social And Demographic Pre-Disposing Characteristics. *CLINICS* 2010; 65(9):895-903
- Choi, K and Lee, I. Fall Risk in Low-Income Elderly People in One Urban Area. *J Korean Acad Nurs.* 2010 Aug;40(4):589-598.
- CIA World Factbook. Retrieved January 18, 2012. <https://www.cia.gov/library/publications/the-world-factbook/geos/rp.html>
- Ferrer, A., et al. (2011) Risk Of Falls In 85-Year-Olds Is Associated With Functional And Cognitive Status: The Octabaix Study. AGG-2528.
- Gates, S. et al (2008). Systematic Review Of Accuracy Of Screening Instruments For Predicting Fall Risk Among Independently Living Older Adults. *Journal of Rehabilitation Research and Development* 2008, 45(8); 1105-1116. Society; 48:883-893.