FALL RISK AMONG OLDER ADULTS RESIDING IN BHARATPUR, CHITWAN, NEPAL

Jogmaya Limbu¹, Sunita Poudyal¹*
¹School of Nursing, Chitwan Medical College, Bharatpur, Chitwan, Nepal

ABSTRACT

Background: Falls in older people is a common serious health problem that has profound impact on overall health and quality of life of older people. The aim of this study was to assess the fall risk among older adults.

Methods: The descriptive cross-sectional study was carried out among older adults residing in Bharatpur, Chitwan. A total of 98 older adults were selected by using simple random sampling technique. The data were collected by using structured interview schedule and fall risk was assessed by Timed Up and Go (TUG) test. Data were collected from 23rd June, 2019 to 7th July, 2019. Obtained data were analyzed using descriptive and inferential statistics.

Results: The study findings revealed that more than half (60.2%) of the older adults were from the age group of ≤79 years, male (63.3%) and almost half (50%) were illiterate. Nearly all (96.9%) older adults were living with their family however, 50% were undernourished (BMI- <22.9). Majorities (66.3%) were suffering from chronic diseases and had been taking medicine. Majority of older adults reported vision problem (64.3%) and hearing problem (60.2%). However, only 8.2% reported history of fall within last 6-12 months. More than half (59.2%) of the older adults had high risk of fall and found significant association with age (p=0.039) and vision problem (p=0.043).

Conclusions: More than half of the older adults are in risk of falls. Therefore, more emphasis should be given in screening the older people for fall risk factors as preventive measures.

INTRODUCTION

Falls are a common and serious problem for aged people. Adults older than 65 years of age suffer the greatest number of fatal falls.¹ Approximately, 28 - 35% older people over 64 years of age and 32% - 42% older people of 70 years and above fall each year.² The frequency of falls increases with aging³-⁴ and number of chronic or co-morbidities including arthritis, depression, diabetes mellitus and osteoporosis.⁵-⁶ Environmental hazards play a significant role in occurrence of fall.⁶-⁸

Falls are a major threat to older adults’ quality of life, causing decline in functional status, physical activities and social status as well.⁹,¹⁰ Fractures, contusions, abrasions, and lacerations are the physical consequences of falls.¹¹,¹² The cost of treatment is high in fall related injuries¹³ and causes a huge burden to family and also the society in terms of healthcare utilization and costs.¹⁴

Moreover, fall injury is the leading cause of premature death among people of 65 and older.¹⁵ In Nepal, 2.1 million people (8.1 % of the total population) are in age of 60 and above.¹⁶ A study of Nepal reported maximum number of falls occurred in the age group of 60 to 65 years.¹³ Studies showed that older adult had medium to high risk of fall.¹⁶-¹⁷ Fall risk assessment is important to prevent injuries and reduce the cost of care. Furthermore, addressing the risk factors can reduce the rates of falling.¹⁸ This study aimed to assess the fall risk and risk factors of falls among older adult residing in the community.

METHODS

A descriptive, cross sectional study was conducted to assess the fall risks among older adults aged 70 and above residing in Bharatpur 10, Chitwan. The total population (N) was 242 and sample size was estimated based on 10% prevalence¹⁹ with 95% confidence interval and 5% permissive error. Total sample size was 98. Simple random sampling technique was used to select desired sample. Data were collected from 23rd June, 2019 to 7th July, 2019.

Ethical approval was obtained from CMC Institutional Review Committee (CMC-IRC). All participants were informed about the purpose of the study and informed consent was taken from each respondent prior to data collection. Data were collected by using structured interview schedule through face to face interview method for socio-demographic information and risk factors of falls. In addition, the fall risk was assessed by Timed Up and
Go (TUG)\textsuperscript{19} test in terms of balance and mobility (r=0.99%). The level of fall risk was measured by calculating the total time of respondents according to their age obtained from TUG test and classified into two categories (high risk and no risk). For high risk, time more than 10.2 seconds for age group 70-79 and 12.7 for age group 80-99 years to complete TUG test and No fall risk was categorized as time less than 10.2 seconds for age group 70-79 and 12.7 for age group 80-99 years to complete TUG test. Older adults who were unwilling to participate and unable to speak or severely ill, bed ridden were excluded from the study.

The collected data were coded and entered into IBM SPSS for windows version 20. Descriptive statistics such as frequency distribution, percentage, mean, standard deviation, median, and interquartile range were computed to describe socio-demographic characteristics and risk factors. Chi-square test was used to measure the association between level of fall risk and selected variables.

RESULTS

Among 98 respondents, more than half (60.2%) of the respondents were age group of ≤79 years, majority were male (63.3%) and half (50%) were illiterate. Very few (23.5%) older adults were working currently. Among them, 18.3% were work as a homemaker and only 5.2% were work as a farmer and business. Almost all (96.9%) respondents were living with their family (Table 1).

Table 1: Respondents’ socio-demographic characteristics

| Variables             | Frequency (%) |
|-----------------------|---------------|
| Age group             |               |
| ≤79 years             | 59 (60.2)     |
| ≥80 years             | 39 (39.8)     |
| Median =77.5, IQR (Q3-Q1) =82-73, Min=70, Max=99 |
| Sex                   |               |
| Male                  | 62 (63.3)     |
| Female                | 36 (36.7)     |
| Education status      |               |
| Illiterate            | 49 (50)       |
| General literate      | 30 (30.7)     |
| Basic level           | 10 (10.2)     |
| Secondary level       | 5 (5.1)       |
| Bachelor and above    | 4 (4)         |
| Working currently     |               |
| Yes                   | 23 (23.5)     |
| No                    | 75 (76.5)     |
| Living with family    |               |
| Yes                   | 95 (96.9)     |
| No                    | 3 (3.1)       |

Table 2 depicts that only 8.2% of older adults reported that they had history of falls within last 12 months and majorities (66.3%) had reported history of chronic disease and had been taking medicines. Regarding chronic diseases, 26.5% were suffering from hypertension, diabetes (22.5%), asthma (7.1%) and only 5.1% were suffering from arthritis and others (skin allergies, chronic gastritis and renal stone) respectively. Similarly, half (50%) of the older adults were undernourished (BMI <22.9) (not shown in table). Likewise, majorities were reported vision problem (64.3%) and hearing problem (60.2%), whereas 17.3% were suffering from urinary problem. Less than half (48%) of older adults had uses assistive devices and more than half (58.2%) had habit of exercises such as physical exercise, yoga and meditation (Table 2).

Table 2: Respondents' fall risk factors

| Fall risk factors                      | Frequency (%) |
|----------------------------------------|---------------|
| History of falls within 12 months      | 8 (8.2)       |
| History of chronic disease             | 65 (66.3)     |
| Taking medicine currently             | 65 (66.3)     |
| Vision problem                         | 63 (64.3)     |
| Hearing problem                        | 59 (60.2)     |
| Urinary problem                        | 17 (17.3)     |
| Use of assistive devices               | 47 (48)       |
| Exercise habit                         | 57 (58.2)     |

More than half (59.2%) of the older adults had high risk of fall and 40.8% had no risk of fall (Table 3).

Table 3: Respondents' level of fall risk

| Age in years | Level of fall risk |
|--------------|--------------------|
|              | High risk | No risk |
| ≤79 years    | 30 (50.8%) | 29 (49.2) |
| ≥80 years    | 28 (71.8%) | 11 (28.2) |
| Total        | 58 (59.2%) | 40 (40.8%) |

The level of fall risk was statistically significant with age (p=0.039) and vision problem (p=0.043). Whereas other variables sex, current occupation, history of falls, history of chronic diseases, number of medicines taking, hearing and urinary problems were not associated with level of fall risk (Table 4).

DISCUSSION

Fall risk is high among older adults. More than half of the older adults were male and almost all were living with their family. However, half of older adults were undernourished and more than half were in risk of fall. Increasing age and vision problem are the factors that influence the risk of fall.

The finding of this study revealed that more than half (59.2%) of the older adult had high risk of fall. However, a study conducted in India showed only 20% of older adults had medium to high risk of falls.\textsuperscript{16,17} Similarly, a study of Malaysia showed only 13.3% of institutionalized elderly had moderate to high risk of falls.\textsuperscript{20} In our study, only 8.2% of older adults reported history of falls within last 12 months and found no association between the level of fall risk and history of fall. This finding is consistent with the finding of study done in Nepal.
Table 4: Association between respondents’ level of fall risk with selected variables

| Variables                       | Level of fall risk | \(\chi^2\) | p-value |
|---------------------------------|--------------------|-------------|---------|
|                                 | No risk            | High risk   |         |
| Age in group                    |                    |             |         |
| ≤79 years                       | 29 (49.2)          | 30 (50.8)   | 4.265   | 0.039   |
| ≥80 years                       | 11 (28.2)          | 28 (71.8)   |         |         |
| Sex                             |                    |             |         |
| Male                            | 23 (37.1)          | 39 (62.9)   | 0.967   | 0.326   |
| Female                          | 17 (47.2)          | 19 (52.8)   |         |         |
| Current occupation              |                    |             |         |
| Yes                             | 13(56.5)           | 10(43.5)    | 3.069   | 0.080   |
| No                              | 27(36.0)           | 48(64.0)    |         |         |
| History of fall within 12 months|                    |             |         |
| Yes                             | 3(37.5)            | 5(62.5)     | 1.136   | 1.00    |
| No                              | 37(41.1)           | 53(58.9)    |         |         |
| History of chronic disease      |                    |             |         |
| Yes                             | 27(41.5)           | 38(58.5)    | 0.042   | 0.838   |
| No                              | 13(39.4)           | 20(60.6)    |         |         |
| Number of medicines taking      |                    |             |         |
| Taking one medicine             | 16(43.2)           | 21(56.8)    | 0.721   | 0.603   |
| Taking multiple medicines       | 8(36.4)            | 14(53.6)    |         |         |
| Vision problem                  |                    |             |         |
| Yes                             | 21(33.3)           | 42(66.7)    | 4.089   | 0.043   |
| No                              | 19(54.3)           | 16(45.7)    |         |         |
| Hearing problem                 |                    |             |         |
| Yes                             | 13(33.3)           | 26(66.7)    | 1.502   | 0.220   |
| No                              | 27(45.8)           | 32(54.2)    |         |         |
| Urinary problem                 |                    |             |         |
| Yes                             | 9(52.9)            | 8(47.1)     | 1.252   | 0.262   |
| No                              | 31(38.3)           | 50(61.7)    |         |         |

Significance level at <0.05

and South India, where 13% participants reported a fall in the past.\(^{13,18}\) However, a study conducted in United Arab Emirates showed that about half of the respondents had a history of fall in the past two years\(^{4}\) and found significant association.\(^{7,16}\)

Similarly, present study found that the level of fall risk is statistically significant with age and vision problem (p=<0.05). Similar findings were found in the studies conducted in United State Emirates\(^4\), United State\(^5\), Saudi Arabia\(^7\), Brazil\(^12\) and India\(^18,21\) which showed that age is statistically significant. Likewise, the studies showed level of fall risk was statistically significant with vision problem.\(^15,21,22\)

Moreover, in present study, the level of fall risk was not significant with other variables such as sex, chronic diseases, urinary problems, use of assistive devices and taking number of medication (p=>0.05). However, other studies found that fall risks was significantly associated with sex\(^11,18,23\) and chronic diseases.\(^24\) Study of New England showed significant association between level of fall risk and urinary problem.\(^25\) In addition, a study of United Arab Emirates showed association between fall risk and gender, use of assistive device and number of taking medication daily.\(^4\) These discrepancies in the findings might be the difference in setting, sample size and health care facilities etc.

There were some limitations in our study. First, this study was conducted in small sample size and single setting so findings could not be generalized. Second, data were collected at one point of time so, unable to determine cause and effects of falls and its risk factors. Third, screening for functional status was not done. Other possible risk factors such as housing conditions could be included in future research to allow a more holistic assessment of risk factors associated with falls. Still, the findings of the study may helpful to take appropriate action to prevent fall risk among older adults.

CONCLUSION

The risk of falls is high among older adults. Majority of older adults have vision and hearing problems and nearly half were
Researchers are very grateful to Chitwan Medical College Institutional Research Committee for approval to conduct this research. The researchers’ sincere gratitude and thanks to Mr. Jaya Prasad Singh for rendering statistical expertise and participants deserve due thanks and appreciation.

FINANCIAL DISCLOSURE: None

REFERENCES:

1. World Health Organization. Falls; 2018. Available from: [LINK] [Accessed June 10 2019].
2. World Health Organization. Falls; 2012. Available from: [LINK] [Accessed June 4 2019].
3. Sophonratanapokin B, Sawangdee Y, Soonthorndhada K. Effect of the living environment on falls among the elderly in Thailand. Southeast Asian Journal of Tropical Medicine and Public Health. 2012; 43(6):1537. [PMID]
4. Sharif SI, Al-Harbi AB, Al-Shihabi AM, Al-Daour DS, Sharif RS. Falls in the elderly: assessment of prevalence and risk factors. Pharmac Prac (Granada). 2018; 16(3):1206. [DOI]
5. Hong GR, Cho SH, Tak Y. Falls among Koreans 45 years of age and older: incidence and risk factors. Journal of advanced nursing. 2010; 66(9):2014-24. [DOI]
6. Tinetti ME, Doucette J, Claus E, Marottoli R. Risk factors for serious injury during falls by older persons in the community. Journal of the American geriatrics society. 1995; 43(11):1214-21. [DOI]
7. Alshammari SA, Alhassan AM, Aldawsari MA, et al. Falls among elderly and its relation with their health problems and surrounding environmental factors in Riyadh. J Family Community Med. 2018; 25(1):29-34. [DOI]
8. Todd C, Skelton D. What are the Main Risk Factors for Falls Amongst Older People and what are the Most Effective Interventions to Prevent These Falls?. World Health Organization. 2004. [LINK]
9. Phelan EA, Mahoney JE, Vott JC, Stevens JA. Assessment and management of fall risk in primary care settings. Medical Clinics. 2015; 99(2):281-93. [DOI]
10. Stel VS, Smit JH, Pluijm SM, Lips P. Consequences of falling in older men and women and risk factors for health service use and functional decline. Age and ageing. 2004; 33(1):58-65. [DOI]
11. Stevens JA, Sogolow ED. Gender differences for non-fatal unintentional fall related injuries among older adults. Inj Prev. 2005; 11(2):115-119. [PMID]
12. Ferretti F, Lunardi D, Bruschi L. Causes and consequences of fall among elderly people at home. Fisioterapia em Movimento. 2013; 26(4):753-62. [DOI]
13. Rai BK, Chaudhari R, Yadav A, Rai B. A cross-sectional study of fall injuries in senior people attending emergency ward in BPKIHS, a tertiary level hospital, Dharan, eastern region of Nepal. Health Renaissance. 2015; 13(1):77-85. [DOI]
14. Wang J, Chen Z, Song Y. Falls in aged people of the Chinese mainland: epidemiology, risk factors and clinical strategies. Ageing Res Rev. 2010; 9 Suppl 1:S13-S17. [DOI]
15. Government of Nepal, Central Bureau of Statistics. National Population and Housing Census 2011. [LINK]
16. Lotheti SK, Kankanam G, Sushma KS, Samhota O, Madhavi BD. Assessment of risk of fall in elderly people in the urban field practice area of Community Medicine Department, Andhra Medical College, Visakhapatnam. Andhra Pradesh International Journal of Community Medicine and Public Health. 2018; 5(10):4368-71. [DOI]
17. Feil M, Gardner LA. Falls risk assessment: A foundational element of falls prevention programs. Pennsylvania Patient Safety Authority. 2012; 9(3):73-81. [LINK]
18. Sharma PK, Bunker CH, Singh T, Ganguly E, Reddy PS, Newman AB, Cawley JA. Burden and correlates of falls among rural elders of South India: Mobility and Independent Living in Elders Study. Current gerontology and geriatrics research. 2017 Jun 13; 2017. [DOI]
19. UNMC. Timed UP and Go (TUG) Test. Available from: [LINK] [Accessed June 8 2019].
20. Kioh SH, Rashid A. The prevalence and the risk of falls among institutionalized elderly in Penang, Malaysia. Med J Malaysia. 2018; 73(4):212-9. [PMID]
21. Chacko TV, Thangaraj P, Muhammad GM. Epidemiology of fall and its risk factors among elders in a rural area of Coimbatore, India. Int J Community Med Public Health. 2017; 4(10):3864-9. [DOI]
22. Lord SR, Dayhew J. Visual risk factors for falls in older people. J Am Geriatr Soc. 2001; 49(5):508-15. [DOI]
23. Orces CH. Prevalence and determinants of fall-related injuries among older adults in Ecuador. Current gerontology and geriatrics research. 2014; 2014. [DOI]
24. Lawlor DA, Patel R, Ebrahim S. Association between falls in elderly women and chronic diseases and drug use: cross sectional study. Brmj. 2003; 327(7417):712-7. [DOI]
25. Tinetti ME. Clinical practice. Preventing falls in elderly persons. New England Journal of medicine. 2003, 348:42-9. [DOI]