

## Falls in Community-dwelling Korean Older Adults: Prevalence and Associated Factors: The 2019 Community Health Survey Data\*

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### Abstract

*Objectives: This study aimed to identify the prevalence of falls in community-dwelling older adults and to identify associated factors using the 2019 Community Health Survey. Methods: The original data was from the 2019 Community Health Survey, and the study sample comprised 1,642 older adults aged 65 years and older in Jeju province. Data collection was conducted from August 16 to November 20, 2019, through an interview done by a trained investigator. Respondents were queried about demographic characteristics, riding bicycles, hospital treatment due to an accident or poisoning in the previous year, fall experiences in the past year, fear of falling, self-management status, and pain and discomfort. Multivariate logistic regression analysis was used to evaluate for associations between potential risk factors and falls. Results: The prevalence of falls in this community-dwelling older adults was 13.1%. Falls were associated with riding bicycles (odds ratio = 4.7; 95% confidence interval: 2.26–9.81), fear of falling (odds ratio = 0.3; 95% confidence interval: 0.24–0.49), hospital treatment due to an accident or poisoning in the previous year (odds ratio = 7.8; 95% confidence interval: 5.02–12.19), self-management status (odds ratio = 0.6; 95% confidence interval: 0.34–0.89), and pain and discomfort (odds ratio = 0.6; 95% confidence interval: 0.40–0.87). Conclusions: We found that the prevalence of approximately about 13% of older adults living in a community has experienced falls. Based on the results of the study, we provided primary data to develop the care management intervention*

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*program to prevent falls and avoid risk factors that cause falls in community-dwelling older adults.*

**Keywords:** Falls, Aged, Safety, Community

## 1. Introduction

During the long journey of life, humans may face threats to safety and life, such as natural disasters, infections, disasters, and accidents. Adults may take preventive actions to avoid these threats or attempt to exercise control to minimize their effects. However, compared to adults, older people are physically and mentally weaker in prevention and defense against threats and other factors related to aging. Several factors can easily be exposed to safety risks. Falls are the leading cause of accident-related deaths among the elderly, and 20-30% of older adults who fall suffer moderate to severe injuries, increasing the risk of early death [1].

In Korea, it has been reported that fall-related deaths are ten times higher, hospitalizations are eight times higher among older adults compared to younger people, and many older people who have experienced falls do not try to move for fear of falling and getting hurt again [2]. In the United States, millions of older people over the age of 65 experience falls each year, and in fact, more than one in four older people fall each year [3]. Old age itself is a significant risk factor, but actual falls in older adults are caused by a complex interaction of various factors with age [4, 5.]

Falls in older adults cause traumatic brain injury, injury-related death, mobility impairment, and severe health problems, leading to a decline in quality of life and significant medical expenses due to treatment and hospitalization. Falls that pose a threat to the safety of older adults are preventable, and therefore, if risk factors for falls are identified and prevention and management are implemented, fall accidents can be reduced, and ultimately, the quality of life can be improved.

According to the 2014 National Older Koreans Data, 25.1% of all older people experienced falls in the previous year; the average number of falls was 2.3, and 63.4% of older adults reported receiving hospital treatment due to falls [6]. In the 2014 National Older Koreans Data, only 132 older people in Jeju province were included, which was insufficient to identify the characteristics associated with falls [6].

Therefore, we tried to identify the prevalence of falls and associated factors with falls among older adults in the 2019 Community Health Survey [7]. The purpose of our research is to enhance understanding of the prevalence of falls and identify associated characteristics, therefore, informing the development and management of a fall prevention program.

## 2. Materials and Methods

### 2.1 Research Design

This was a cross-sectional survey study that conducted secondary data analysis using raw data from the 2019 Community Health Survey.

### 2.2 Subjects

The research subjects were based on data from 1,642 older people (710 men, 932 women) aged 65 or older in Jeju province who participated in the 2019 Community Health Survey.

## 2.3 Measurement

The variables incorporated in this study encompassed a range of demographic, lifestyle, and health-related factors. These included gender, age, employment status, education level, marital status (living with a spouse or not), riding a bicycle, self-management status (categorized as ‘no problem’ or ‘have a problem’), pain and discomfort (yes or no), hospital treatment due to an accident or poisoning in the previous year (yes or no), and fear of falling.

## 2.4 Original Data Source and Data Collection

The Community Health Survey is a nationally approved statistical survey conducted by the Korea Disease Control and Prevention Agency, 255 city, county, and district public health centers, and 35 universities by the Regional Health Act. This system is established to ensure a sustainable implementation dedicated to Community Health Surveys. The 2019 Community Health Survey took place from August 16 to November 20, 2019. The survey targeted adults aged 19 or older living in the sample household at the time of the survey, with households and household members being the survey units. The survey was conducted using a 1:1 interview method (Computer Assisted Personal Interviewing) with the survey subjects. Investigators visited sample households and utilized an electronic survey form loaded on a laptop.

## 2.5 Data Analysis

SAS (version 9.2 for Windows) program was used to identify the prevalence of falls and associated factors with falls among older adults living in Jeju province. Descriptive data were shown using frequency, mean, and standard deviations. A multivariate logistic regression analysis was performed to identify potential fall risk factors.

## 3. Results

### 3.1 General Characteristics

Table 1 shows that a total of 1642 older adults were enrolled in this study. Of the subjects, 56.7% were female. The mean age of the subjects was 74.4 years old. By age group, 54.8% of the subjects were in the group aged 65-74 years, and 8.7% were in the group over 85 years. Among the subjects, 54.5% had a job, 43.5% more than middle school, and 66.4% were living with a spouse. Riding bicycles was reported by 8.3%, and no problem with self-management by 85.3% of subjects. 56.2% had pain and discomfort, and 7.2% had experienced Hospital treatment due to an accident or poisoning in the previous year.

**Table 1. General characteristics of subjects (N=1,642)\***

Characteristics	Categories	n (%)	Mean±SD
Gender	Male	710 (43.3)	
	Female	932 (56.7)	
Age (yr.)	65-74	900 (54.8)	74.38±6.61
	75-84	600 (36.5)	

	≥85	142 (8.7)
Job	Yes	894 (54.5)
	No	746 (45.5)
Education level	≤Elementary school	926 (56.5)
	≥Middle school	714 (43.5)
Living with a spouse	Yes	1088 (66.4)
	No	551 (33.6)
Riding bicycles	Yes	136 (8.3)
	No	871 (91.3)
Self-management	No problem	1400 (85.3)
	Have a problem	242 (14.7)
Pain and discomfort	No	718 (43.8)
	Yes	923 (56.2)
Hospital treatment due to an accident or poisoning in the previous year	Yes	118 (7.2)
	No	1524 (92.8)

\*The total number of subjects does not match the respondents

### 3.2 Prevalence of Falls

As shown in Table 2, 13.1% of older adults experienced a fall in the past year, and 86.9% of the subjects did not experience a fall. 46.5% of older adults feared falling, and 53.5% of the subjects reported no fear of falling.

**Table 2. Prevalence of falls and fear of falls (N=1,642)**

Characteristics	Categories	n (%)
Falls experience in the past year	Yes	215 (13.1)
	No	1427 (86.9)
Fear of falling	No	878 (53.5)
	Yes	762 (46.5)

### 3.3 Factors Associated with Falls

Table 3 shows that factors associated with falls revealed that driving bicycles (odds ratio = 4.71, 95% confidence interval: 2.26-9.81), fear of falls (odds ratio = 0.34, 95% confidence interval: 0.24-0.49), hospital treatment due to an accident or poisoning in the previous year (odds ratio = 7.83, 95% confidence interval: 5.02-12.19), self-management (odds ratio = 0.60, 95% confidence interval: 0.34-0.89), and pain and discomfort (odds ratio = 0.59, 95% confidence interval: 0.40-0.87).

**Table 3. Multiple Logistic Regression Analysis (N=1,642)**

Variables	Odds ratio	95% CI	p
Riding bicycles	4.71	2.26-9.81	<.001
Fear of falling	0.34	0.24-0.49	<.001
Hospital treatment due to an accident or poisoning in the previous year	7.83	5.02-12.19	<.001
Self-management	0.60	0.34-0.89	.011
Pain and discomfort	0.59	0.40-0.87	.007

CI: confidence interval; Reference: Riding bicycles (yes=1); fear of falling (no=1); hospital treatment due to an accident or poisoning in the previous year (yes=1); self-management (no problem=1); pain and discomfort (no=1)

## 4. Discussion

In this study, the fall rate that occurred in the past year among older people in one area was found to be approximately 13%, and this result was lower than the fall prevalence rate of 15.7% and 27.5% among older adults over 65 years of age [8,9]. Falls are the leading cause of injury among adults 65 and older in the United States, and in 2018, there were approximately 3 million emergency room visits, more than 950,000 hospitalizations or transfers to other facilities and trauma centers, and about 32,000 deaths from fall-related injuries among older adults, with fatalities from falls increasing. The most significant increase in fall accidents has been observed in the population over 85 years of age [9]. In Korea, there is a growing need for epidemiological data on the incidence of falls and complications resulting from falls, both at home and in facilities. This is particularly crucial as falls and their prevention are becoming increasingly important issues due to the aging of older adults.

This study showed that the risk of falls among older adults was high when riding a bicycle and when there was a history of previous fall treatment. Older people risk falling due to decreased muscle strength and decreased sense of balance, and they often experience falls even while walking [8]. Due to the physical functional characteristics of the elderly, it is believed that the risk of falling is exceptionally high when riding a bicycle. For older people who ride bikes, fall prevention education, such as safe walking and riding a bike, should be provided. These fall precautions and safety education should be promoted or delivered directly through broadcasting, community health centers, or community senior centers. Those with a previous history

of falls had a high risk of experiencing falls again, and these characteristics make it likely that older adults may be vulnerable due to weak physical function, reduced cognitive function, or underlying disease [10].

Fear of falling could be a factor that prevents people from being active and maintaining mobility. This further reduces physical mobility in older people, increasing the risk of falls [11]. Therefore, the fear of falling in older adults should be assessed periodically, and interventions and physical exercises to reduce the individual's fear should be implemented to prevent falls and promote activity, thereby improving quality of life.

The study found that older adults with self-care management or no pain or discomfort had a reduced risk of falls. Therefore, it would be good to prevent falls among the elderly by providing systematic health care at public and community health centers so that the elderly can maintain self-management and pain and discomfort control.

This study provides important insights into factors associated with falls in older adults in Jeju province. The findings suggest that fall prevention strategies should consider physical health factors and psychological aspects such as fear of falling and the importance of post-hospital care. The careful examination of fall risk factors described in this study highlights the importance of fall prevention in older adults. By addressing physical and psychological aspects such as maintaining self-care skills, alleviating the fear of falling, and ensuring care after hospitalization, the quality of life in the older population can be significantly improved. This study identified the prevalence and risk factors of falls among older adults in one region, and therefore, there are limitations in generalizing the results to all older people in Korea.

## **5. Conclusion**

The prevalence of falls among community-dwelling older adults in Jeju province was about 13%. Principle risk factors associated with falls were riding a bicycle, fear of falling, and treatment history for previous falls. Based on these results, it is believed that a management system and intervention program are needed to reduce the prevalence of falls and manage risk factors for falls. Improving their physical function and nutritional status is fundamental to addressing risk factors related to falls in older adults. As age increases, frailty and sarcopenia may occur, which increases the risk of mobility impairment, cognitive decline, and infection in older adults. These can eventually lead to falls. Therefore, we suggest measures regarding exercise and diet to prevent falls for older adults. Exercise is an implemented structured program tailored to improve balance, strength, and flexibility in older adults. This includes tai chi, yoga, and strength training focusing on lower body strength. Regular physical activity can reduce the risk of falls by improving muscle tone and coordination. Good nutrition and hydration, such as calcium and vitamin D, are necessary to promote their physical and psychological health, muscle strength, and bone health. Adequate hydration is recommended to prevent dehydration, leading to dizziness and instability. Fall prevention is essential for healthy aging and independence in older adults.

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