CHARACTERISTICS OF FALLS IN OLDER PATIENTS WITH OVERWEIGHT AND OBESITY

Tran Viet Luc[1,2], Nguyen Thi Thu Huong[1,2], Nguyen Lan Anh[2], Nguyen Ngoc Tam[1,2], Vu Thi Thanh Huyen[1,2]
1. Hanoi Medical University, 2. National Geriatric Hospital

DOI: 10.47122/VJDE.2023.64.8

SUMMARY

Objectives: To assess characteristics of falls and associations with general characteristics among older people with overweight and obesity. **Subjects and Methods**: A cross-sectional study on 233 older patients with overweight and obesity examined and treated at National Geriatric Hospital from January to May 2023. Fall characteristics, general information and classification of obesity were collected by interviewing using a questionnaire. **Results:** Of the total 220 participants, the proportion of patients with falls in the last 12 months was 16.7%. 46.2% of participants have recurrent falls. The percentage of fall injury and fall that required hospitalization were 69.2% and 5.1%, respectively. Falls inside the house/ bedroom account for the highest rate at 12%. Slips and falls accounted for the highest proportion in the circumstances of falls (6.9%) and loss of balance (4.3%). The group of subjects ≥ 75 years old had a higher rate of falls (69.2%) compared with the group of subjects aged 65-74 years (30.8%) ($p<0.05$). **Conclusion:** 1 out of 6 elderly people who are overweight or obese has had a fall in the past 12 months. Our results highlighted that falls are related to advanced age among this population.

Keywords*: Falls, elderly, obesity, overweight.*

Correspondence: Tran Viet Luc
Address: Hanoi Medical University
Submission date: .....August 2023
Revised date: 12th August 2023
Acceptance date: 30th September 2023
Email: tranvietluc@hmu.edu.vn
Tel: 0912532456

1. INTRODUCTION

According to the statistics of the General Statistics Office of Vietnam, in the period from 2009 to 2019, the elderly population (over 60 years old) increased from 7.45 million people (accounting for 8.86% of the total population) to 11.41 million people (accounting for 11.86% of the total population). It is expected that by 2029, the elderly population will reach 17.28 million people (16.53% of the total population [1]. Rapid population aging and the increasing number of elderly people are creating many challenges for Vietnam.

Currently, overweight and obesity is a common condition in all ages. Overweight and obesity are associated with serious health risks. According to statistics from the US Centers for Disease Control and Prevention (CDC), the obesity rate among adults aged 20 years and older in 2017-2018 was 42.4%, of which the number of obese 60-year-olds accounted for 43.3% [2]. Overweight and obesity make the body unbalanced, heavy, and slow, causing difficulties in daily activities, reducing

labor productivity, and reducing quality of life. Obesity interferes with balance in elderly patients with unstable posture putting them at greater risk of falls [3].

Fall, overweight, and obesity in elderly patients all have complications that adversely affect the treatment process of patients.

Not only that, the cost to treat the consequences of falls, overweight, and obesity in elderly patients is very large. Thus, the aims of this study were to assess characteristics of falls and associations with general characteristics among older people with overweight and obesity at the National Geriatric Hospital.

2. SUBJECTS AND METHODS

2.1. Subjects

Patients aged 65 years old and older were diagnosed with overweight and obesity according to WHO criteria for Asians [4], who were examined and treated at the National Geriatric Hospital from January to May 2023, and have the physical and cognitive abilities to do a face-to-face interview.

Exclusion criteria: patients with severe acute conditions such as ketoacidosis coma, hyperosmolar coma, coma due to cerebrovascular accident, exacerbation of heart failure decompensation, liver failure, exacerbation of the chronic obstructive pulmonary disease.

2.2. Study design

- A cross-sectional descriptive study
- The sample was selected according to the convenience sampling method
- The sample size is calculated using the formula:

$$n = \frac{(z_{1-a/2})^2}{d^2} p(1-p)$$

p=0.1313 (Percentage of patients with BMI ≥23 having a fall within the previous 12 months according to Nguyen Trung Anh) [5].

According to the formula, the smallest sample size is n = 176 patients. In fact, 233 patients participated in this study.

2.3. Variables

• General information: age, gender, living status, living area, weight, height, body mass index (BMI).

• Obesity classification:

BMI (kg/m^2)	Classification
23 – 24.9	Overweight
≥ 25.0	Obesity

• **Fall characteristics**: interviewing the patient and the patient's family about the history of falls, the number of falls in the last 12 months, the location of the fall, the circumstances of the fall, the injury after the fall, the fall requiring hospitalization.

2.4. Tools and data collection method

Data were collected by using a research questionnaire through interviews at National Geriatric Hospital.

2.5. Data processing and data analysis

The process of data coding, entry into REDCap, and analysis was done by using Statistical Package for Social Science (SPSS) software (version 22.0).

Descriptive statistics were adopted to examine characteristic data: frequency, percentage, and mean with standard deviation. Chi-square were performed to evaluate the factors related to fall among this population. Statistical significance was accepted at the 95% confidence level ($p < 0.05$).

3. RESULTS

3.1. General characteristics

Table 1. Demographic characteristics of this population (n=233)

Characteristics		Frequency (n)	Percentage (%)
Age group (year)	65 - 74	122	52.4
	≥ 75	111	47.6
	Mean age	75.3 ± 6.8	
Gender	Men	87	37.3
	Women	146	62.7
BMI (kg/m²)	Overweight (23 - 24,9)	128	54.9
	Obesity (≥ 25)	105	45.1
Living status	Alone	15	6.4
	With family	218	93.6
Living area	Urban	160	68.7
	Rural	73	31.3

Among 233 participants in this study, the rate of women was 62.7%. The mean age was 75.3 ± 6.8 years old. The age group from 65 - 74 years old accounted for 52.4%, and the number of people aged ≥ 75 years old accounted for 47.6%. The percentage of overweight and obesity were 54.9% and 45.1%, respectively. 68.7% of study participants currently live in urban areas and 31.3% live in rural areas. Most of the patients (93.6%) have been living with their families.

3.2. Falls characteristics in older patients with overweight and obesity

Table 2. History of falls in the last 12 months of the study subjects (n=233)

Characteristics		Frequency (n)	Percentage (%)
Fall in the last 12 months	No	194	83.3
	Yes	39	16.7
Number of falls	1	21	53.8
	≥ 2	18	46.2
Fall injury	No	12	30.8
	Yes	27	69.2
Fall required hospitalization	No	37	94.9
	Yes	2	5.1

The proportion of patients with falls in the last 12 months was 16.7%. 46.2% of participants have recurrent falls. The percentage of fall injury and fall that required hospitalization were 69.2% and 5.1%, respectively.

Table 3. Location and circumstances of the fall (n=233)

Characteristics		Frequency (n)	Percentage (%)
Location of falls	Indoor/bedroom	28	12.0
	Toilet	5	2.1
	Stair	3	1.3
	Outside on the porch	1	0.4
	Out on the road	9	3.9
	Other	3	1.3
Circumstances of falls	Dizziness when standing up	9	3.9
	Slip and fall	16	6.9
	Overbalance	10	4.3
	Other	9	3.9

Falls inside the house/bedroom account for the highest rate at 12%, falls on the street accounted for 3.9%, falls in the bathroom accounted for 2.1%, falls on the stairs and on the porch accounted for the lower rates (1.3% and 0.4%).

Slips and falls accounted for the highest proportion in the circumstances of falls (6.9%), loss of balance (4.3%), dizziness when standing up, and other causes (falling over, falling while traveling by means of transport…) accounted for a lower proportion (3.9%).

3.3. Association between falls and general characteristics

Table 4. Association between falls and general characteristics (n=233)

Characteristics		Non-fall	Fall	p
Gender	Men	74 (38.1%)	13 (33.1%)	0.57
	Women	120 (61.9%)	26 (66.7%)	
Age group (year)	65 – 74	110 (56.7%)	12 (30.8%)	<0.001
	≥ 75	65 (43.3%)	27 (69.2%)	
BMI (kg/m²)	Overweight	106 (54.6%)	22 (56.4%)	0.84
	Obesity	88 (45.4%)	17 (43.6%)	
Living status	Alone	10 (5.2%)	5 (12.8%)	0.07
	With family	184 (94.8%)	34 (87.2%)	
Living area	Urban	131 (67.5%)	29 (74.4%)	0.40
	Rural	63 (32.5%)	10 (25.6%)	

The group of subjects ≥ 75 years old had a higher rate of falls (69.2%) compared with the group of subjects aged 65-74 years (30.8%) ($p<0.05$).

There was no difference in the rate of falls in the last 12 months between overweight and obesity, gender, living status, and living area ($p>0.05$).

4. DISCUSSION

Through the history of falls within the last 12 months, 39 subjects (accounting for 16.7%) responded that they had fallen in the past 12 months.

The 2008 WHO report on fall prevention in the elderly with a fall rate of 28-35% [6]. In our study, there were 18 subjects (46.2%) who fell 2 or more times in the last 12 months and the largest number of relapses was 6 times. A total of 76 falls in 39 subjects in the last 12 months.

Of the 39 subjects who had a fall in the past 1 year, there were 27 subjects with soft tissue injuries or fractures, and 2 cases were hospitalized due to falls.

In our study, falls inside the house/ bedroom accounted for the highest rate of 12%, falling on the street/ride accounted for 3.9%, falling in the bathroom accounted for 2.1%, falling on bridge stairs and patios accounted for a lower proportion (1.3% and 0.4%).

This rate is similar to the study of Thomas M. Gill [7], according to his research, the most fall in the living room area, followed by the bedroom, kitchen, and bathroom area, and the least fall in the hallway area.

Contrary to our study, in the study of Nguyen Quynh Xuan, it was shown that falls in the outdoor area accounted for the highest rate (51.1%), followed by the stairs area (43.7%), falls in the bathroom and in the bedroom account for the same rate (40% and 38.8%) [8].

Having such a difference is often related to the structure of the house and the living habits of each family. In our study, most of the elderly's activities take place in the indoor area, so the rate of falls in that area will be higher and most elderly people live on one floor, not up and down the stairs. daily so the rate of falling stairs is very low.

Slips and falls accounted for the highest percentage of falls (6.9%). Usually occurs in locations such as bathrooms, yards, and gardens. It can be due to a number of reasons such as shoes that reduce friction, and water-stagnation surfaces that cause slips.

A few measures to help reduce the risk of slipping and falling in the elderly such as using anti-slip materials (floor tiles, floor mats with good adhesion to prevent slipping, …), wearing shoes that fit the feet with anti-slip base, building a well-lit living space, arrange a system of handrails, firmly grasping bars in areas such as bathrooms, toilets, stairs, ...

Loss of balance (4.3%), and dizziness when standing up (3.9%) are the next 2 causes leading to falls in the study participants. In the elderly, there are many diseases related to loss of balance and dizziness when standing up, such as anemia, orthostatic hypotension, vestibular dysfunction, and decreased functional activity of the body.

To overcome this situation, it is necessary to advise the family and the subject on how to change their position and should keep balance, stabilize the posture before moving, and have someone support or use mobility aids if necessary. necessary.

There are also a number of other causes (knockdown, fall while traveling by means of transport, etc.) which account for a lower percentage.

In our study, there was a statistically significant difference in the rate of falls in the last 12 months between age groups. The group of subjects ≥75 years old had a higher

rate of falls (69.2%) than the subjects aged 65-74 years old (30.8%).

This result is consistent with the study by Mitchell et al. on community-dwelling individuals aged 65 and over in New South Wales which also showed that an individual's risk of falling increases with increasing age [9].

5. CONCLUSIONS

1 out of 6 elderly people who are overweight or obese has had a fall in the past 12 months. Our results highlighted that falls are related to advanced age among this population.

REFERENCES

1. Tổng cục thống kê Việt Nam. Tổng điều tra dân số và nhà ở năm 2019. *Già Hóa Dân Số Và Người Cao Tuổi Ở Việt Nam*. Published online 2021:vii.
2. Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017–2018. Published June 26, 2020. Accessed April 18, 2023. https://www.cdc.gov/nchs/products/databriefs/db360.htm
3. Rossi-Izquierdo M, Santos-Pérez S, Faraldo-García A, et al. Impact of obesity in elderly patients with postural instability. *Aging Clin Exp Res*. 2016;28(3):423-428. doi:10.1007/s40520-015-0414-4
4. The Asian perspective: Redefining Obesity and its treatment. Accessed May 31, 2023. https://apps.who.int/iris/bitstream/handle/10665/206936/0957708211_eng.pdf?sequence=1&is
5. Nguyễn Trung Anh, Nguyễn Đặng Khiêm, Đặng Thị Xuân, Vũ Thị Thanh Huyền. Nghiên cứu nguy cơ ngã và tỷ lệ ngã ở bệnh nhân cao tuổi có tăng huyết áp. *Tạp chí tim mạch học Việt Nam*. 2021:92-98.
6. World Health Organization. WHO global report on falls prevention in older age. In: *Ageing and Life Course, Family and Community Health : WHO Global Report on Falls Prevention in Older Age*. World Health Organization; 2008. Accessed March 31, 2023. https://apps.who.int/iris/handle/10665/43811
7. Gill TM, Williams CS, Tinetti ME. Environmental hazards and the risk of nonsyncopal falls in the homes of community-living older persons. *Med Care*. 2000;38(12):1174-1183. doi:10.1097/00005650-200012000-00004
8. Nguyễn Quỳnh Xuân, Nguyễn Thị Thu Hương, Nguyễn Trung Anh. Nghiên cứu nguy cơ ngã ở bệnh nhân cao tuổi có sử dụng nhiều thuốc. *Tạp chí y học Việt Nam*. 2018:148.
9. Mitchell RJ, Lord SR, Harvey LA, Close JCT. Associations between obesity and overweight and fall risk, health status and quality of life in older people. *Aust N Z J Public Health*. 2014;38(1):13-18. doi:10.1111/1753-6405.12152