

ASSOCIATION BETWEEN GERIATRIC CHARACTERISTICS AND FALLS
IN OLDER PATIENTS WITH OVERWEIGHT AND OBESITY

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SUMMARY

Objectives: To assess geriatric characteristics and associations with falls 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. Falls in the last 12 months and geriatric characteristics were collected by interviewing using a questionnaire. **Results:** Of the total 233 participants, the proportion of patients with falls in the last 12 months was 16.7%. The majority of study participants had 2 or more diseases, accounting for 94%. Prevalence of polypharmacy was 63.1%. The rate of ADL impairment was 17.6% and IADL impairment was 16.7%. There was 75.5% of study participants had a high likelihood of depression. The majority of study participants rated quality of life at a high and very high level. There is a statistically significant difference in the rate of falls in the last 12 months between the dependent group and the non-dependent group in activities daily living ADL and IADL ($p < 0.05$). **Conclusion:** Multi-comorbidities, polypharmacy and depression are the common geriatric syndromes in overweight and obese elderly people. Fall in the past 12 months associated with activities daily living ADL and IADL.

Keywords: Falls, geriatric syndrome, elderly, obesity, overweight.

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1. INTRODUCTION

Rapid population aging and the increasing number of elderly people are creating many challenges for Vietnam. The issue of caring for the elderly in terms of both material and spiritual life is one of the very important contents in the social policies of most countries in the world, including Vietnam. However, our country's health care system is facing a series of health problems related to old age.

Overweight and obesity is a common condition and associated with serious health risks. Obesity interferes with balance in older patients with postural instability putting them at higher risk of falling [1]. Not only that, overweight, obesity and its complications cause about 300,000 premature deaths each year in the US, making it the second leading preventable cause of death, second only to smoking.

In the United States, falls are the leading cause of injury in older adults (≥ 65 years of age). In 2018, 27.5% of adults aged 65 and older reported at least one fall in the past year, equivalent to 35.6 million falls, and 10.2% of those reported at least one injury. Fall-related injuries that limit regular activities for at least one day or require medical attention [2]. In 2020, 36,508 adults aged 65 and older died from preventable falls

and more than 2.8 million were treated in emergency departments [2]. Health care costs for older adults who fall are approximately \$50 billion annually [2]. In Vietnam, there has been research showing that 1 in 5 patients ≥ 60 years old has a high risk of falling, and this rate increases with age [3]. Currently, in the world there have been many studies on the risk of falls and proposed interventions to reduce the risk. At the National Geriatric Hospital, fall management for the elderly is integrated into daily health care activities for patients. Early detection of the risk of falls, thereby reducing the rate of hospital falls and their complications, is extremely important.

The aims of this study were to assess geriatric characteristics and associations with falls 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:

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

$p=0.1313$ (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, 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

✓ **Comorbidities:** collect information about current diseases through interviews and patient medical records.

✓ **Polypharmacy:** collect information about medications being used through interviews and patient medical records and prescription.

✓ **Functional activities:**

- **Activity Daily Living (ADL) [6]:** Interview the patient or caregiver about the patient's daily living activities according to 6 questions about activities: personal hygiene, dressing, bathing, moving, excretion, eating. A total score of less than 6 points indicates impairment in daily functioning

- **Instrumental activity Daily Living (IADL) [7]:** Interview the patient/caregiver with 8 questions about the patient's daily activities when using media tools: using the phone, shopping, cooking, cleaning the house, washing clothes, use of transportation, use of drugs, ability to manage expenses. A total score of less than 8 means there is impairment in daily activities using tools and equipment.

✓ **Depression – Mini GDS [8]:** Interview the patient/caregiver using a set of questions about 5 issues: feeling depressed and sad, life being empty, being happy most of the time, feeling your condition is hopeless. Total score ≥ 1 point: high likelihood of depression.

✓ **Quality of life – EQ-5D-5L [9]:** Interview the patient/caregiver with 5 questions about the following areas: Mobility, self-care, usual activities, pain/discomfort, anxiety/depression. Evaluation method: From 21 - 25 points: Very high; From 16 - 20 points: High; From 11 - 15 points: Average; From 6 - 10 points: Poor; ≤ 5 points: Very poor.

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

A total of 233 participants in this study. Women accounted for 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.

3.2. Geriatric characteristics in older patients with overweight and obesity

Table 1. Geriatric characteristics of the study subjects (n=233)

Characteristics		Frequency (n)	Percentage (%)
Multi-comorbidities	< 2 diseases	14	6.0
	≥ 2 diseases	219	94.0
Polypharmacy	No	86	36.9
	Yes	147	63.1
ADL	Dependence	41	17.6
	Independence	192	82.4
IADL	Dependence	39	16.7
	Independence	194	83.3
Quality of life (EQ-5D-5L)	Very high (21-25)	144	61.8
	High (16-20)	74	31.8
	Average (11-15)	13	5.6
	Poor (6-10)	2	0.9
	Very poor (0-5)	0	0
Depression (Mini GDS)	Possible depression (≥ 1 point)	176	75.5
	No (0 point)	57	24.5

The majority of study participants had 2 or more diseases, accounting for 94%. 63.1% of subjects used 5 or more drugs simultaneously in the last 1 month. The majority of study participants rated quality of life at a high and very high level, a few subjects rated quality of life at an average or poor level, and no subjects rated quality of life at a very poor level. The rate of ADL impairment was 17.6% and IADL impairment was 16.7%. There was 75.5% of study participants had a high likelihood of depression.

3.3. Association between falls and geriatric characteristics

Table 2. Association between falls and geriatric characteristics (n=233)

Characteristics		Non-fall n (%)	Fall n (%)	p-value
Multi-comorbidities	< 2 diseases	14 (7.2%)	0 (0.0%)	0.08
	≥ 2 diseases	180 (92.8%)	39 (100%)	
Polypharmacy	No	75 (38.7%)	11 (28.2%)	0.22
	Yes	119 (61.3%)	28 (71.8%)	
ADL	Dependence	28 (14.4%)	13 (33.3%)	<0.001
	Independence	166 (85.6%)	26 (66.7%)	
IADL	Dependence	23 (11.9%)	16 (41.0%)	<0.001
	Independence	171 (88.1%)	23 (59.0%)	
Depression	Possible depression	47 (24.2%)	10 (25.6%)	0.85
	No	147 (75.8%)	29 (74.4%)	

There is a statistically significant difference in the rate of falls in the last 12 months between the dependent group and the non-dependent group in activities daily living ADL and IADL ($p < 0.05$).

There is no statistically significant relationship between the rate of falls in the last 12 months and multi-comorbidities, polypharmacy and depression ($p > 0.05$).

3.4. Association between falls and quality of life

Table 3. Association between falls and quality of life (n=233)

Characteristics		Non-fall n (%)	Fall n (%)	p-value
Quality of life (EQ-5D-5L)	Very high (21-25)	127 (65.5%)	17 (43.6%)	0.06
	High (16-20)	56 (28.9%)	18 (46.2%)	
	Average (11-15)	10 (5.2%)	3 (7.7%)	
	Poor (6-10)	1 (0.5%)	1 (2.6%)	
	Very poor (0-5)	0 (0%)	0 (0%)	

There is no statistically significant relationship between the rate of falls in the last 12 months and quality of life ($p > 0.05$).

4. DISCUSSION

This result showed that most of the subjects participating in the study had 2 or more diseases, accounting for 94%. Among them, hypertension accounts for the highest rate (82.4%), followed by diabetes (41.6%), knee osteoarthritis (15.9%), spinal degeneration and other diseases. Other joint diseases (15%), Parkinson's disease (10.7%), cardiovascular diseases account for 9%, and other diseases account for a lower proportion. These are common diseases and fit the disease model in the elderly.

In this study, the majority of research subjects used many types of drugs in the past month (including doctor-prescribed drugs, over-the-counter drugs, traditional medicine, vitamins, and supplements). There were 147 subjects who used at least 5 drugs, accounting for 63.1%. This result is consistent with the study of Mitchell et al. which showed that elderly people who are overweight or obese are more likely to take four or more prescribed medications compared to people with normal weight [10].

With aging population, the function of our organs increasingly declines, so the elderly gradually lose their independence in daily life. In our study, the rate of functional impairment (ADL) was 17.6% and impaired functional activity using media (IADL) was 16.7%. There are 75.5% of study participants had a high likelihood of depression. The majority of study participants rated their quality of life as high and very high at 61.8% and 31.8% respectively, with a few subjects rating their quality of life as average (5.6%) and poor (0.9%), no subjects rated quality of life as very poor.

Our study also showed that there was a difference in the rate of falls in the last 12 months with multimorbidity. Although not statistically significant, it can be seen that all study participants who fell were in the

multimorbidity group. According to research by Immonen and colleagues on 872 elderly people (65-98 years old) also shows that people with many diseases may have a higher risk of falling and people with 5 or more chronic diseases fall at least 2 times. times within the last 3 months [11].

In our study, it was found that the group of subjects rated very high and high quality of life had the highest rate of falls in the past 12 months at 43.6% and 46.2%, respectively. Subjects with average and poor quality of life had lower fall rates of 7.7% and 2.6%, respectively. This result is because subjects with very high and high quality of life often have no or little difficulty in walking, personal care, daily activities, and no or little discomfort or pain. Because of pain and sadness, you will not be careful about falling risk factors around you, making you more likely to fall. When subjects in the group with average and poor quality of life have difficulty in daily activities, they will take measures to prevent falls or get help in walking and daily activities. However, this relationship is not statistically significant.

In our study, when evaluating the relationship between the rate of falls within the last 12 months and functional daily functioning (ADL), instrumental daily functioning (IADL) in humans In the elderly with overweight and obesity, we found that subjects with ADL impairment and IADL impairment had a lower fall rate than subjects without impairment in daily functional activities. In the study by Nguyen Trung Anh and colleagues [5], the results showed that: in the group of elderly people with ADL and IADL impairment, the fall rate was higher than in the group of elderly people without ADL and IADL impairment. There is such a difference because most of the elderly in our study live with their families or caregivers, they responded that they always receive

support or almost do not need to participate in daily activities when receiving feel at risk of falling or falling again. This significantly reduces the rate of falls/re-falls in the group of subjects with ADL and IADL impairment. In contrast, the group of subjects without ADL or IADL impairment means they can participate in daily activities without assistance, so the fall rate is higher. It is possible to reduce the risk of falls in subjects without impaired ADL or IADL function by educating the elderly and their families about fall risk factors and supporting the elderly during daily activities daily activities.

5. CONCLUSIONS

Multi-comorbidities, polypharmacy and depression are the common geriatric syndromes in overweight and obese elderly people. Fall in the past 12 months associated with activities daily living ADL and IADL.

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