

## Research Article

# Use of Benzodiazepines and Fall Risk Assessment in Older Adult Patients

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## Abstract

**Background:** Among the most common changes in older adults are a decrease in muscle fibers, loss of muscle strength, visual deficit and difficulty maintaining balances, which are themselves factors that produce greater vulnerability to falls. The medications associated with a higher frequency of falls we have antihypertensive, antidiabetics and psychotropic such as benzodiazepines, producing this last one muscle weakness, ataxia, sedation, memory alterations of which muscle weakness could be what doubles the risk of falls in people over 65 years of age.

**Objective:** To determine the risk of falling in older adult's patients with benzodiazepine use.

**Methods:** Participants in this cross-sectional study were evaluated with the Downtown fall risk index. For qualitative variables, percentages and frequencies will be used. And for the quantitative variables, measures of central dispersion such as median and mean will be made. The information obtained was analyzed in the statistical program SPSS version 25.

**Results:** A total of 52 patients were included in the study. It was found that 98% of patients using benzodiazepines had a high risk of falls, of which 23% had already had a previous fall, 75% used hypotensive agents in addition to benzodiazepines and 38.5% had alteration in visual perception. Women had the highest risk at 67.4%.

**Conclusions:** Assessment of fall risk should be part of the daily routine of all health personnel to prevent complications that can reduce the patient's quality of life. It is important for older adults to have regular eye exams to detect possible vision problems in time.

**Keywords:** Benzodiazepines; Accidental falls; Frail elderly; Geriatric assessment; Visual perception

## Introduction

People worldwide are living longer. Today most people can expect to live into their sixties and beyond. Every country in the world is experiencing growth in both the size and the proportion of older persons in the population [1].

This population phenomenon brings with it various considerations in medical practice, because aging is a gradual process that is characterized by a decrease in the efficiency of the functioning of the individual's organs and systems and an increase in the risk of acquiring acute and chronic diseases [2].

Among the most common changes presented in older adults are a decrease in muscle fibers, loss of muscle strength, visual deficit (loss of visual acuity, problems in depth perception), difficulty maintaining balance and the appearance of vertigo. Which are themselves factors that produce greater vulnerability to falls [3].

A fall is defined by the WHO as any involuntary event that causes the body to lose balance and hit the ground or another firm surface that stops it; constituting a geriatric syndrome of multifactorial origin that has physical, social and psychological consequences, which makes it a major public health problem [4,5].

The majority of falls result only in bruises (50%), wounds or fractures (90% are in the hip, pelvis or wrist), however those caused by a prolonged stay on the ground such as dehydration, rhabdomyolysis must be taken into account, ulcers, infections and mobility consequences [6].

Regarding the medications associated with a higher frequency of falls in older adults, we have antihypertensive medications (due to the orthostatic hypotension caused), antidiabetics (since it can cause hypoglycemia) and psychotropic drugs (benzodiazepines,

antidepressants, antipsychotics, antiepileptics) since they These cause drowsiness and/or decreased motor coordination. The latter being the ones that have the greatest relationship with falls [7].

Although benzodiazepines are generally safe drugs, they are not exempt from adverse effects, produced mainly by their action on the central nervous system, among the most common of which are: muscle weakness, ataxia, sedation, memory alterations, discontinuation reactions and risk. of dependency; of which muscle weakness could be what doubles the risk of falls in people over 65 years of age [8].

Currently, its prescription in this age group has increased and it is used for periods longer than 3 months, which further increases its adverse effects [9]. And although it is already known that the use of benzodiazepines is an important and modifiable risk factor for falls, studies still show that a third of older adults suffer a fall each year, of which 40-50% are over 75 years old [10-12].

It is due to the different factors that older adults present that a fall risk assessment is necessary using an instrument, such as the J.H. Downton, which is a scale that unifies screening criteria that are shown to have a greater impact on the risk of falls, such as the previous history of falls, the medications used, whether they present sensory deficits or alterations in mental status and what their ambulation, in which if a score greater than 2 points is obtained, it is considered at high risk of falls [13-15].

This study aims to determine de risk of falling in older adult's patients with benzodiazepine use.

## Materials and Methods

A descriptive cross-sectional study was carried out in Tijuana, Mexico, between February and April of 2024. This research was developed in a primary care unit of Family Medicine number 27 of the Mexican Institute of Social Security. Patients 60 or older with use of benzodiazepines who agreed to participate in the study and fill out informed consent were interviewed.

At the beginning of the interview, the social demographic data collection sheet will be filled out with the participant 's responses; the variables collected are: age, education, occupation, gender and marital status. Later, the J.H. Downton Scale will be applied to assess risk of falls in older adults. This scale evaluates previous falls, medications, sensory-motor deficits, mental status, marching and age. The scores for each part is 0 and 1. With 2 or more points is considered high risk.

### Statistical analysis

For qualitative variables, percentages and frequencies will be used, which will be represented by tables. And for the quantitative variables, measures of central dispersion such as median and mean will be made.

### Ethical aspects

This study was approved by the Local Health Research Committee and the Research Ethics Committee number 204 with registration number R-2024-204-017. The research was conducted under the General Health Law on Health Research, the Declaration of Helsinki and bioethical principles.

## Results

A total of 52 participants were included in the study, with 37-woman (67.4%) and 15 men (32.7%). The mean age was 70.3 years. Within the marital status variable, 32.6% were widowed, followed by 34.8% married and 32.6% single. Regarding education status, it was found that the majority attended primary school with a 44% followed by lower secondary education in a 38.4% (Table 1).

Regarding the assessment of the J.H. Downton Scale, 51 patients had a high risk of fall, and only 1 patient has no risk of fall. Reviewing the risk scale by evaluation parameters, it can be described that the highest scores were observed in: 90.4% had a good orientation, 76.9% had not suffered a previous fall, 75% used hypotensive medications, 67.3% used other medications, and 38.5% had visual alterations, 53.8% walked normally (Table 2). Of this total, 12 (23.1%) of these patients had suffer a previous fall, of whom 8 of them used hypotensive medication and 9 has visual alteration.

**Table 1:** General characteristics of study participants (n=52).

Variables		n	%
Age-years		70.3 ± 7.35	
Gender	Female	35	67.4%
	Male	17	32.6%
Marital Status	Single	17	32.6%
	Married	18	34.8%
	widowed	17	32.6%
Education status	No education	4	7.6%
	Elementary	23	44.2%
	Secondary	20	38.6%
	High School	2	3.8%
	Bachelor degree	3	5.8%
	Postgraduate	0	0

**Table 2:** J.H. Downton Scale parameters evaluation.

Variables		n	%
Previous fall	Yes	12	23.1%
	No	40	76.9%
Medications	Diuretic	2	3.8%
	Hypotensive	39	75%
	Other	35	67.3%
Sensorial Deficit	Visual	20	38.5%
	Hearing	10	19.2%
State of mind	Oriented	46	90.4%
	Confused	6	9.6%
Walking	Secure with help	19	36.5%
	Unsecure with or without help	5	9.6%
	Normal	28	53.8%

## Discussion

A study in Ireland by Rivasi, *et al.* in 2019 mentions that patients aged 60 years or older who take benzodiazepines have a higher risk of falls due to the hypotensive effect they could have. Therefore, a geriatric evaluation was carried out on 538 participants; 67.7% were women and the average age was 72.7 years; where it was found that the basal systolic pressure was lower and the decrease 10 seconds after standing up was greater in benzodiazepine users, which as a consequence generated a greater risk of falling. In our research, it was similarly found that 12 participants (23%) had already suffered a previous fall and of which 8 (15.3%) of them took hypotensive medications, which could be associated with the fall that had already occurred.

García-Martínez, *et al.* in 2022 in Spain, investigated the characteristics that are associated with a new fall in patients who had received emergency care for a fall, where it was found that the incidence of falls was higher in women 69.6%, one of the drugs that the most consumed were benzodiazepines, 35%, and 61.1% had visual impairment. In our population, the percentage of visual

alterations that occurred in participants who had already suffered a fall was 53.8%, which could mean that the fall is associated not only with visual decline but also with a lack of constant use of corrective lenses, which are not adequately graduated or do not have them. Some external factor related to the fall site could also be considered, but more studies are required to establish causality.

Finally in Mexico, Grajeda-Manríquez, *et al.* in 2023 conducted a study on 378 patients to evaluate the risk of falling in older adults, of which 118 participants (31%) used some type of benzodiazepine (81% clonazepam); consumption by sex was 79% in female patients and 21% in male patients; The J.H. scale was used. Downton where 100% of the participants using benzodiazepines had a high risk of falling.<sup>35</sup> In comparison with the current study, the results found are similar since it was also observed that almost all (98%) of our participants had a risk of falling, high rate of falls with the use of benzodiazepines, being more frequent in women (67.4%).

## Conclusions

The use of benzodiazepines is a risk factor for falls in older adults. The exposed risk of these patients has been demonstrated in different national and international studies; however, comprehensive care has not been systematized to adequately regulate, limit and reduce its consequences, despite having tools or guides that establish criteria. to avoid inappropriate medication such as the STOPP/START criteria.

As a primary care unit, the detection and prevention of falls should be part of the daily work of all health personnel. Palliative care for people with gait disorders is also essential for educating not only the patient, but also the caregiver or family members who live in the same house to improve the patient's quality of life. The active participation of physiotherapy staff in the "active aging" group would be of great importance so that in this way there is time, space and personalization of information, as well as the redistribution of spaces for the assignment of one with greater Accessibility for the entire population would be valuable to reach all patients at risk. Also, it is important for older adults to have regular eye exams to detect possible vision problems in time.

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