

Risk Factors of Falling among Elderly People in Suez Canal University Hospitals

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Abstract

Background: Falling was considered an important problem among elderly in developing countries including Egypt. Identification of risk factors of falling among elderly is important for the effective prevention and control of falling. **Aim:** This study aimed to assess risk factors of falling among elderly people in Suez Canal University hospitals. **Study setting:** This study was carried out in outpatient clinics in Suez Canal university hospitals. **Design:** A descriptive design was utilized. **Sample:** Convenient sample of 310 elderly persons. **Tools of data collection:** Four tools were used in the current study are A- Structured interview questionnaire B- Berg Balance scale for measuring balance C- The Timed Up and Go test scale for measuring basic functional mobility D-The Modified Falls Efficacy Scale for measuring fear of falling. **Results:** More than one third of studied elderly sample had a history of previous falling. Less than one third of them suffered from vision problems and almost one fifth of the sample suffers from hearing problems. **Conclusion:** There were statistically significance differences between age, chronic diseases, urinary incontinence, senses problems, walking daily, sleeping problems, polypharmacy, balance, mobility, fear of falling, presence of bathtub and history of falling. **Recommendations:** Identifying factors related to falls among elderly is important in helping to detect the risks of occurrence of falls, as well as for proposing strategies for preventive care among elderly people who have already suffered falls.

Keywords: Falling, Elderly, Risk factors.

1. Introduction

As global ageing accelerates, the incidence of age-related health problems, including falls is increasing. Nearly one-third of elderly people over the age of 65 years fall one or more times each year, and the number

increases when the age increases; the annual incidence of falls in elderly people over 80 years old is as high as 50% (Zhao et al.,2020)

Age, gender, medication, historical falls, physical or cognitive impairments, and environmental hazards have been reported as

significant risk factors for falls. Additionally, Socioeconomic status of the elderly is the social standing of an individual, which is typically measured by several indicators such as education, occupation, income and wealth. (Kim, Choi & Xiong, 2020).

The first step in preventing falls is the identification of high-risk patients. In this regard, risk factors are considered as the key to identifying patients susceptible to falling and selecting effective measures in fall prevention. (Najafpour et al.,2019) .

Significance of the study:

Prevalence of falls among elderly in Egypt is estimated to be (33.3%). Geriatric Falls are considered as one of the most common and serious public health problems as they are common causes

Aim of the Study

The aim of the present study was to assess risk factors of falling among elderly people in Suez Canal University hospitals.

Objectives of the Study :

- Identify intrinsic risk factors of falling among elderly people in Suez Canal University hospitals.
- Identify extrinsic risk factors of falling among elderly people in Suez Canal

University hospitals.

- Determine the relationship between falling and intrinsic and extrinsic risk factors among elderly people in Suez Canal University hospitals.

Research Questions:

- Are there intrinsic risk factors related to falling among elderly people?
- Are there extrinsic risk factors related to falling among elderly people?
- Is there a relationship between falling and intrinsic and extrinsic risk factors among elderly people?

Subjects and Methods

Study Design: -

A descriptive study design was applied in this study.

Study setting:

The present study was carried out at outpatient clinics at Suez Canal University hospitals which were: the internal medicine, orthopedics, dental, ophthalmology, Ear, nose and throat and Rheumatology clinics since they were the most frequented clinics for the elderly people and the nursing homes in the governorate do not have a large number of

elderly people to cover the required sample number.

Study population:

The target population of the study was elderly people (310 elderly person).

***Sample technique:**

Convenience sampling technique was used to collect research participants according to the inclusion criteria to reach the determined sample size.

***Sampling criteria**

Inclusion criteria:

- 1- Independent elderly person.
- 2- Accept participation in the research.

D-Tools of data collection:

The data were collected through four tools:

Tool (1): Structured interview questionnaire: consists of five parts:

Part (1): Demographic characteristics for the participants such as age, sex, marital status, education, occupation, etc.

Part (2): History of falling episodes (causes of falling, place of falling, frequency of falling, complications of falling ...ect).

Part (3): History of chronic diseases such as

hypertension, diabetes mellitus, etc; any sensory disabilities, urinary incontinence and sleeping problems.

Part (4): polypharmacy (number of drugs is taking per day, side effects of polypharmacy, ect).

Part (5): Home environmental condition: reported by the client. Home entrance (stairs, doorstep, lighting); inside (stairs, floors, furniture, doorstep, lighting); bathroom (floors, toilet, tub). The presence of any hazard in each of these items was considered unsafe (**Shimaa, et. al.2014**).

Tool (2) -Berg Balance scale for measuring balance:

The Berg Balance Scale (BBS) as pointed out by **Berg et al., (1992)**. It was used to evaluate balance. The BBS was 14-item balance assessment tool that scored on a 5-point ordinal scale (0-4) measuring levels of ability in performing each task (4=safe and independent, 0=in capable). The highest total possible score on berg balance scale was 56, indicating excellent balance. (**Esmat Elsayed, 2010**). It was simple and easily scored as the following:

-Low fall risk (41-65), Medium fall risk (21-40), High fall risk (0-20)

Too

1 (3) – The Timed Up and Go test scale for measuring basic functional mobility:

It was used to measure basic functional mobility. The time was taken to complete rising from a chair, walking 10 ft (3m), turning, walking back to the chair and sitting was recorded in seconds. The starting position was standardized so that the subjects commenced the test with their feet flat on the floor and their arm resting on arm rests. No physical assistance was given. Each participant was asked to perform three tests' trials. The mean score was recorded.

Scoring system:

<10 seconds = normal

< 20 seconds = good mobility, can go out alone, mobile without a gait aid.

< 30 seconds = problems, cannot go outside alone, requires a gait aid and high risk of falling (Esmat Elsayed, 2010).

Tool (4)-The Modified Falls Efficacy Scale (MFES) for measuring fear of falling:

This scale was developed by Hill et al., (1996). It was translated by the researcher. It was a one-page form, consisting of 14 questions each related to a particular activity (e.g., getting dressed, taking a bath, crossing roads etc.). The questions were aimed to

determine how confidently seniors feel they were able to undertake each activity .The MFES was designed to assess the degree of perceived efficacy at avoiding a fall during each of 14 relatively non-hazardous activities of daily living (taking a bath or a shower, preparing meals ,walking around the house ,getting in and out of bed ,answering the door or telephone ,getting in and out of bed, answering the telephone ,getting dressed and undressed simple shopping ,using public transport and crossing roads). (Esmat Elsayed, 2010).

Scoring system:

Low modified falls efficacy scale (0-47)

Moderate modified efficacy scale (48-93)

High modified efficacy scale (94-140)

***Pilot study**

A pilot study was carried out on 10% of the sample (31 elderly person) before actual data collection. The purpose of the pilot study was to examine the applicability and ensure the clarity of the tools. Data obtained from the pilot study were analyzed. According to its results, items corrected, modified, omitted, or rearranged then the tools were finalized. It also helped in estimating the time needed for interviews and evaluating the appropriate setting to perform the interview. The sample

involved in the pilot study was excluded from the study sample to ensure the stability of answers.

***Content validity:**

The tool was tested for its content validity, comprehensiveness, and applicability by a jury consisting of five experts of community health nursing field who revised the tools, and modifications were done according to their opinion.

***Tool reliability:**

Cornbrash alpha coefficient was calculated to assess the reliability of the tools through its internal consistency. Suggest that a reliability coefficient of 0.70 or higher was acceptable.

***Fieldwork description (Procedures)**

Data collection was started on the beginning of February 2022 and lasted until the end of May 2022. Then the data was collected from the previous mentioned tools, 4days/ week from 9am to 2pm. The researcher filled the previous mentioned tools through structured interview in a private place according to each unit. Each participant took about one hour to complete the four tools. Each day, about five people were interviewed.

At the beginning, it was necessary for the researcher to introduce herself and explain to the participants the purpose of the study. Each participant was personally interviewed for about one hour at outpatient clinics. Completing the constructed interviewing questionnaire, which contains sociodemographic data, falling history, medical history, polypharmacy and home environment assessment.

1. After completing the interviewing questionnaire, the researcher explained to the participant to what extent he /she was confident in performing 14 daily living activities also rate himself or herself from 0 to 10 degree in the items of the modified falls efficacy scale. then the researcher calculated all the degrees and divided them upon the item rated in order to confirm to what extent the elderly person had fear of falling again.
2. After completing the modified falls efficacy scale, the researcher explained to the subject the following test called the timed (Up and Go test), its purpose was to assess the functional ability of the elderly person. The researcher explained the steps of the test to the elderly person. Equipment required was stopwatch, armchair, measuring tape. The instructions

were to walk (not run) as quickly, but as safely as possible.

Method:

-The client began seated in an armchair with his back against the backrest and arms resting on the armrests.

- The client had his walking aid (if required) within reach.

- A marker was placed on the floor three meters from the chair.

- One practice trial was given to become familiar with the test.

- The standardized instruction was given: on the word (go), walk at a comfortable and safe place to the marker on the floor, turn, walk back to the chair and sit down again.

- The test was timed from the instruction (go) until the subject achieves sitting again. The researcher used a stopwatch or a wristwatch with a second hand to time this activity.

A score of 30 seconds or greater indicated the patient has impaired mobility and required assistance (has a high risk of falling)

4-After completing the timed (up and go test), the researcher completed the Berg Balance Scale (BBS), which was 14-item balance assessment tool. Each task was scored

on a five -point scale (0-4) according to the quality of the subject's performance or the time taken to complete the task.

The BBS included tasks such as standing with eyes closed, reaching, standing on one foot and picking up objects from the floor.

The score from 0 to 20 indicated high risk of falling, while the score of 21 to 40 indicated medium risk of falling, and the score from 41 to 56 indicated that the person had low risk factor of falling and independent.

The equipment used for the Berg Balance Scale chair with arms, tape measure, stopwatch, pen and table.

Ethical consideration:

The ethical research considerations in this study included the following:

-The research approval was obtained before study implementation from the ethical committee, and informed consent has been made.

- The researcher cleared the objectives and aim of the study to elderly persons.

-The researcher-maintained confidentiality of elderly persons data.

-The elderly persons were allowed to choose

to participate or not participate and they had right to withdraw from a study any time without penalty.

Statistical design:

Collected data through the questionnaire were arranged, coded, entered, and analyzed using

Chi-square test was used to test relationship between intrinsic and extrinsic risk factors and falling, p value < 0.05 was considered significant.

Statistical Package for the Social Sciences (SPSS version 21) program. Percentage was calculated.

3. Results:

Table 1 shows that, there was there was a statistical significance difference between age, educational level, marital status, occupation and income and history of falling of studied elderly people (<0.001**, <0.001**,0.026*,0.028*and 0.036 respectively).

Continue Table 1 shows that, there was a statistical significance difference between chronic diseases, urinary incontinence, nocturnal enuresis, senses problems,

taking medications, polypharmacy, walking daily and sleeping problems and history of falling (<0.001*,0.001**, <0.001**, <0.001**, <0.001**,0.022*, <0.001**and <0.001** respectively)

Table (2) shows that there was no statistical significant difference between stairs and threshold outside the home and history of falling.

Table (3) shows that there was no statistical significant difference between stairs and threshold outside the home and history of falling.

Table (4) shows that there was a significant statistical difference between risk of falling measured by timed up and go test and history of falling among the studied elderly people(<0.001**)

Table (5). The table shows that there was a significant statistical difference between efficiency level measured by Modified Falls Efficiency of the studied elderly people and history of falling (<0.001**).

Table (6). The table shows that there was a significant statistical difference between efficiency level measured by Modified Falls Efficiency of the studied elderly people and history of falling (<0.001**).

Figure (1) shows that 85.2% of the studied sample had low fall risk and 4.2% of them had high fall.

Figure (2) shows that 56.8% of the studied sample had high fall risk and 43.2% of them had low risk of falling.

Figure (3) shows that 57.1% of the studied elderly people had a high modified efficiency scale and 4.5% of them had low modified efficiency scale.

4. Discussion:

Falls are the sixth leading cause of death among people who are over 65 years old. They make these individuals fragile, insecure and unable to perform their daily activities for fear of falling again. Both intrinsic factors (physiological changes stemming from aging itself; presence of morbidities; and deficits in balance, vision, hearing or gait) and extrinsic factors (environmental risks due to poor lighting or inadequate or slippery floors; risk-prone behaviors, such as going upstairs and downstairs; and routine activities of daily living) play important roles of falling. (Rodrigues, Assef & Lima, 2020).

Regarding association between intrinsic risk factors and of falling. In the present study we found that there was no significant

difference living alone and falling among elderly people. This result may be related to dependence of the elderly on themselves and there was no help to them. This finding was in congruent with Ngamsangiam & Suttanon (2020) who studied (Risk factors for falls among community-dwelling elderly people in Asia) and reported that, persons who lived alone had a higher percentage of falling than those who lived with their families. Elderly person did his daily activities alone and no one helped him or because elderly persons who lived alone may have lack of attention to any obstacles in their way or after falling, they stayed long time on the ground. Also, psychological status of elderly persons who live alone may affect their functional ability.

Additionally, the present study revealed that there was a significant difference between occupation and falling. This finding was in the same direction with (Monachan et al.,2020) who studied that (risk of fall among older adults and its association with cognitive impairment in a semi-urban community) and found that, older people who were at the risk of fall were unemployed and retired . From the researcher point of view, the reason could be lack of activity that led to lack of movement and depression. As a result of their retirement, their income decrease which made

them not got enough care and made them more likely to fall.

The present study revealed that there was a significant difference between suffering from chronic diseases and falling. This finding was in the line with (**Immonen et al., 2020**) who studied (Association between chronic diseases and falls among a sample of older people in Finland) and reported that, fall incidence among community-dwelling older people is highly linked to presence of chronic disease. It could be chronic diseases made the elderly person less physically active, overweight, at risk of malnutrition, reduce body movement, activity and balance which makes the elderly more likely to fall (**Immonen et al.,2020**).

Also, the present study found that there was no significant difference between poor vision and hearing complains and history of falling .These findings were in congruent with (**Zhou et al., 2021**) who studied (Association between sensory loss and falls among middle-aged and older Chinese population) and found that, a decrease in visual acuity could probably lead to inaccurate assessment of environmental obstacles and deficits in daily activities, which eventually prevent older people from avoiding falls and fall-related injuries and decline in vision may also contribute to the development of fear of falling, which are related to increased fall risk

in older adults. These findings of the present study could be due to the researcher did not use scale or test to assess visual acuity or hearing level but it is related to the judgment of the elders about his or her own health status and it was be self-reported poor vision.

Also, there was a statistical significant difference between falling and polypharmacy. This finding in the same line with (**Ming & Zecevic ,2018**) who studied (Medications & polypharmacy influence on recurrent fallers in community) and reported that, polypharmacy might increase the possibility of falling repeatedly 1.5–2 times. This finding because medications such as cardiovascular agents, central nervous system drugs, analgesics and endocrine drugs, increase the risk of falls. The possible underlying mechanisms for the increased risk of falls related to the use of these medications, called “fall risk-increasing drugs” (FRIDs), relate to the adverse effects (eg, dizziness, imbalance or mobility difficulties, reduced attention and vigilance) which led to fall. (**Zaninotto et al.,2020**)

From the researcher point of view, there was a statistical significant difference between falling and polypharmacy because Polypharmacy is linked to increased risk of adverse drug events in older people due to

increased risk of drug interactions which makes the elderly feeling dizzy or confused leading to falling.

Also, there was a statistical significant difference between falling and sleeping problems. This finding was in the line with **(Min & Slattum, 2018)** who studied (Poor sleep and risk of falls in community-dwelling older adults) and reported that, short sleep duration, daytime sleepiness, and napping (sleep problems) appear to be associated with an increased risk of falls. This was may be because Poor sleep quality can lead to many adverse health effects like reduced balance, cognitive impairment and even increased mortality. It also has been associated with an increased risk of falls. **(Jiang et al., 2019)**

Additionally, there was statistical significant difference between risk of falling measures by berg balance scale which measure body balance as intrinsic risk factor of falling and history of falling. In the same way, **(Değer et al., 2019)** who studied (The relationship of balance disorders with falling, the effect of health problems, and social life on postural balance in the elderly living in a district in Turkey) and reported that, there was a relationship between body balance and the prevalence of falling. From the researcher point of view, this finding assured when there

were balance problems, this made the elderly person always felt dizzy and confused and couldn't move well, which made him more likely to fall.

there was statistical significant difference between the risk of falling measured by timed up and go test which measured functional mobility as intrinsic risk factor of falling and history of falling. This finding was in agreement with **(Litwin, Erlich & Dunsky ,2018)** who studied (The complex association between fear of falling and mobility limitation in relation to late-life falls) and reported that elderly people who have a high level of mobility limitation were more likely to fall. The findings of the present study could reveal a need to supportive assistance for the elderly, because they may put themselves in a situation where they got injured.

Also, there was statistical significant difference between efficiency level measured by modified falls efficiency level which measured fear of falling level as intrinsic risk factor of falling and history of falling. This finding was in the same direction with **(Chen et al., 2021)** who studied (The relationship between falling and fear of falling among community-dwelling elderly) and reported that, previous experience of falling was a significant risk factor for FOF(fear of falling), regardless of whether the fall(s) occurred in

the previous month or previous year.

From the researcher point of view, the prior results may be because fear of falling has been linked to functional decline, decreased quality of life, decrease in activity level, depression, loss of social connectivity, decreased self-efficacy and physical frailty which contributed to the risk of falling

Also, regarding association between extrinsic risk factors and falling, there was no statistical significant difference between fallers and non-fallers in terms of home environment. These findings were in contrast with (Nugraha et al, 2022) who studied (Intrinsic and Extrinsic Risk Factor for Fall among Community Dwelling Indonesian Elderly) and reported that, unsafe home environment has higher possibility to increase the risk of falling 2.6 times compared to those in safer environment. From the researcher point of view, these findings might be attributed to the fact that, most causes of falling were due to intrinsic causes or it could be because that home hazards might be eliminated or changed before the studied elderly report about their home. Furthermore, this study collected retrospective history of home falls. It has been showed that hazards were removed or changed the following fall.

Moreover, Falls may be associated with various contiguous environmental hazards such as carpets and rugs. Most falls (72.8%) occur at home. Women represented 80.2% of fall injury victims. Not surprisingly, perhaps, the most common location for fall injuries at home is the bathroom (35.7%). Other environmental hazards include poor stairway design and disrepair, inadequate lighting, clutter, slippery floors, unsecured mats, and the lack of nonskid surfaces in bathtubs. (Alshammari et. al.,2018)

5. Conclusion:

Based on the findings of the present study, it can be concluded that

- There were statistically significance differences between age, educational level, marital status, occupation, income, chronic diseases, urinary incontinence, nocturnal enuresis, senses problems, walking daily, sleeping problems, medications, poly pharmacy, balance, mobility, fear of falling, presence of bathtub and history of falling.
- There were no statistically significance differences between gender, residence, fecal incontinence, vision impairment, hearing complains, Drugs affect

balance, attention and memory (as blood pressure medicine, allergy medicine, hypnotics and tranquilizers, outdoor home environment and indoor home environment and history of falling.

6.Recommendations:

In the light of these findings, the following recommendations are suggested:

1-Identifying factors related to falls among elderly is important in helping to detect the risks of occurrence of falls, as well as for proposing strategies for preventive care among elderly people who have already suffered falls.

2-Implementation of health education programs about risk factors and prevention of falling among elderly people and their care givers at primary health care units or outpatient clinics

Table1. Association Between the intrinsic risk factors and History of falling among studied elderly people.

Intrinsic risk factors	History of falling				P-Value
	Had a history of previous fall (n=122)		Doesn't have a history of previous fall (n=188)		
	N	%	N	%	
Socio-Demographic					
Age (years) Mean \pm SD	70.2 \pm 6.3		64.9 \pm 4.8		<0.001**
Gender					
Male	66	54.1%	115	61.2%	0.217
Female	56	45.9%	73	38.8%	
Educational Level					<0.001**
Illiterate	50	41.0%	40	21.3%	
Can read and write	24	19.7%	28	14.9%	
Basic	20	16.4%	28	14.9%	
Intermediate	19	15.6%	62	33.0%	
University	9	7.4%	30	16.0%	
Marital Status					0.026*
Single / Widow / Divorced	67	54.9%	79	42.0%	
Married	55	45.1%	109	58.0%	
Residence					0.410
Family	109	89.3%	162	86.2%	
Alone	13	10.7%	26	13.8%	
Occupation					0.028*
Doesn't work	102	83.6%	137	72.9%	
Work	20	16.4%	51	27.1%	
Income					0.036*

Sufficient	69	56.6%	132	70.2%	
Not Sufficient	51	41.8%	52	27.7%	
Sufficient and overflowing	2	1.6%	4	2.1%	

Continue Table 1 Association Between the intrinsic risk factors and History of falling among studied elderly people.

Intrinsic risk factors	History of falling				P-Value
	Had a history of previous fall (n=122)		Doesn't have a history of previous fall (n=188)		
	N	%	N	%	
Chronic diseases					
Yes	107	87.7%	105	55.9%	<0.001*
No	15	12.3%	83	44.1%	
Type of disease (n=212)					
Diabetes	45	42.1%	27	25.7%	0.012*
Hypertension	43	40.2%	43	41.0%	0.910
Heart disease	21	19.6%	10	9.5%	0.037*
Kidney disease	15	14.0%	9	8.6%	0.211
Liver disease	22	20.6%	14	13.3%	0.161
Gastrointestinal disease	12	11.2%	16	15.2%	0.387
Parkinson	10	9.3%	4	3.8%	0.105
Rheumatoid	4	3.7%	5	4.8%	0.712
Joint stiffness	19	17.8%	12	11.4%	0.192
Others	2	1.9%	2	1.9%	0.985
Urinary incontinence					
Yes	34	27.9%	6	3.2%	<0.001**
No	88	72.1%	182	96.8%	
Fecal incontinence					
Yes	5	4.1%	2	1.1%	

No	117	95.9%	186	98.9%	0.079
Nocturnal enuresis	68	55.7%	48	25.5%	
Yes					
No	54	44.3%	140	74.5%	<0.001**
Senses problems	94	77.0%	67	35.6%	
Yes					
No	28	23.0%	121	64.4%	<0.001**
Problems: (n=161)					
Vision impairment	49	52.1%	40	59.7%	0.341
Hearing complains	42	44.7%	26	38.8%	0.457
Other	17	18.1%	5	7.5%	0.053
Taking medications:					
Yes	104	85.2%	104	55.3%	
No	18	14.8%	84	44.7	<0.001**
Type of medication (n=208)					
Drugs affect balance, memory and attention	12	11.5	13	12.5	0.832
Others	86	82.7%	81	77.9%	0.383
Polypharmacy (n=208)					
Less than 5 types	66	63.5%	81	77.9%	
5 or More types	38	36.5%	23	22.1%	0.022*
Effect of medications (n=208)					
Negative effect	61	58.7	60	57.7	
No effect	43	41.3	44	42.3	0.888
Negative effect of medications: (n=121)					
Attention	36	34.6%	24	23.1%	0.066

Balance	21	20.2%	16	15.4%	0.365
Memories	14	13.5%	10	9.6%	
Walking daily:					
Yes	82	67.2%	167	88.8%	<0.001**
No	40	32.8%	21	11.2%	
Sleeping problems					
Normal	42	34.4%	132	70.2%	<0.001**
Restless	75	61.5%	51	27.1%	
Insomnia	5	4.1%	5	2.7%	

Table2 . Association between Extrinsic risk factors with history of falling

Extrinsic risk factors	History of falling						X ²	P-Value	CI
	Had a history of previous fall (n=122)		Doesn't have a history of previous fall (n=188)		Total				
	N	%	N	%	N	%			
Outside the House									
Stairs in front of the house									
Yes	109	89.3%	173	92.0%	282	91.0%	0.645	0.422	0.33 – 1.59
No	13	10.7%	15	8.0%	28	9.0%			
If present, quality of stairs: (n=282)									
Smooth / Ceramic / Marble	50	45.9%	89	51.4%	139	49.3%	0.831	0.362	0.50 – 1.29
Rough / Cement / Wood	59	54.1%	84	48.6%	143	50.7%			
Having fractures or erosion: (n=282)									
No	83	76.1%	127	73.4%	210	74.5%	0.263	0.608	0.50 –

Yes	26	23.9%	46	26.6%	72	25.5%			1.51
Not having stairs side rails:									
No	57	52.3%	105	60.7%	162	57.4%			0.87 –
Yes	52	47.7%	68	39.3%	120	42.6%	1.930	0.165	2.29
Not having enough lighting: (n=282)									
No	67	61.5%	120	69.4%	187	66.3%			0.86 –
Yes	42	38.5%	53	30.6%	95	33.7%	1.866	0.172	2.35
Stairs have rubbish or liquids or piles: (n=282)									
No	99	90.8%	147	85.0%	246	87.2%			0.26 –
Yes	10	9.2%	26	15.0%	36	12.8%	2.058	0.151	1.24
Threshold in front of the door:									
Yes	70	57.4%	113	60.1%	183	59.0%			0.56 –
No	52	42.6%	75	39.9%	127	41.0%	0.228	0.633	1.42
If present, quality of the stairs :(n=183)									
Ceramic	34	48.6%	49	43.4%	83	45.4%			0.68 –
Marble	36	51.4%	64	56.6%	100	54.6%	0.473	0.492	2.24
Not having distinct color (n=183)									
No	34	48.6%	51	45.1%	85	46.4%			
Yes	36	51.4%	62	54.9%	98	53.6%			
Looking high off the ground (n=183)									
No	24	34.3%	31	27.4%	55	30.1			0.38 –
Yes	46	65.7%	82	72.6%	128	69.9%	0.965	0.326	1.38
Having fractures or erosion (n=183)									
No	55	78.6%	94	83.2%	149	81.4%			0.64 –
Yes	15	21.4%	19	16.8%	34	18.6%	0.608	0.435	2.87
Light in front of the house									
No	19	15.6%	42	22.3%	61	19.7%			0.86 –
Yes	103	84.4%	146	77.7%	249	80.3%	2.143	0.143	2.84
Insufficient lightening									
No	76	62.3%	113	60.1	189	61%	0.149	0.700	0.57 –

Yes	46	37.7%	75	39.9%	121	39.0%			1.46
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Table (3). Association between risk of falling measured by Berg Balance Scale Level and Fall History among the studied elderly people.

	Fall History				P-Value
	Had a history of previous fall (n=122)		Doesn't have a history of previous fall (n=188)		
	N	%	N	%	
High Risk	13	10.7%	0	0.0%	<0.001**
Medium Risk	29	23.8%	4	2.1%	
Low Risk	80	65.5%	184	97.9%	

Table (4). Association between risk of falling measured by timed up and go test and history of falling in the studied elderly people

	Fall History				P-Value
	Had a history of previous fall (n=122)		Doesn't have a history of previous fall (n=188)		
	N	%	N	%	
Low Risk of falling	21	17.2%	113	60.1%	<0.001**
High Risk of falling	101	82.8%	75	39.9%	

Table (5) Association Between efficiency level measured by Modified Falls Efficiency Level and history of falling among studied elderly people.

	Fall History		P-Value
	Had a history of previous fall (n=122)	Doesn't have a history of previous fall (n=188)	

	N	%	N	%	
Low Efficiency	10	8.2%	4	2.1%	<0.001**
Moderate Efficiency	104	85.2%	15	8.0%	
High Efficiency	8	6.6%	169	89.9%	

Figure 1. Percentage distribution of studied elderly people according to Berg Balance Scale domain score n=310

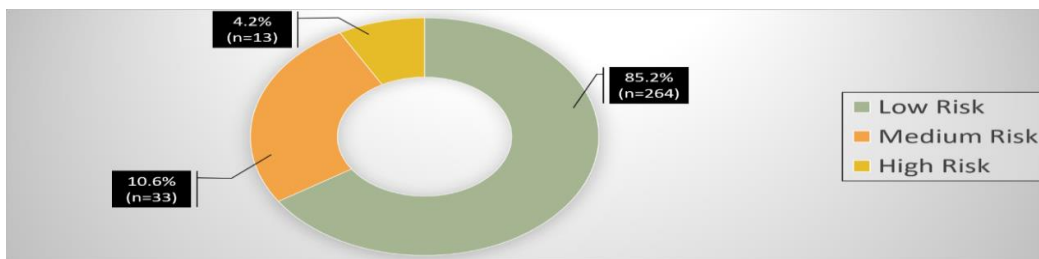


Figure2: Percentage distribution of elderly people according to timed up and go test scale score among the studied elderly people. N=3

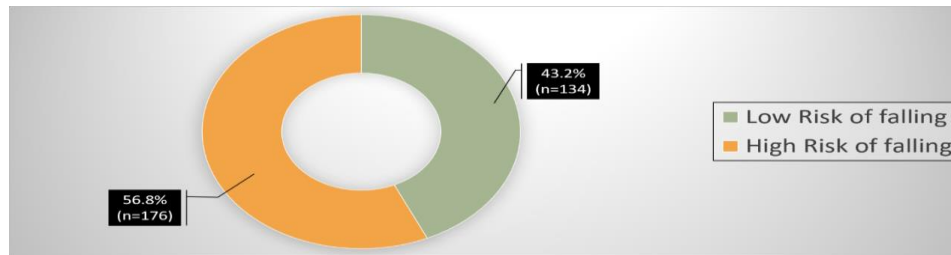


Figure 3. Percentage distribution of the Modified Falls Efficiency Scale domain score among the studied elderly people.

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