Assessment of Elderly Awareness regarding Balance Disorders and Falls Prevention

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ABSTRACT

Background: Aging is associated with a reduction in both physical and cognitive functions of the human body, which also involves the likeliness in the occurrence of age related diseases.**Aim**: The study aims to assess of elderly awareness regarding balance disorders and falls prevention. **Study Design:** A discreptive research design was used in this study. **Setting:** The study was conducted in Ear, Nose & Throat (ENT) and Internal medicine outpatient clinics at Elsalam hospital, Port Said City. **Sample:** A purposive sample was used in this study. **Tools:** three tools were used: **1st tool:** An interviewing questionnaire; it was developed and its data was collected by the researcher and included 3 parts: **Part 1:** Elderly demographic characteristic, **Part 2:** Elderly medical history (Past and present), **2nd tool:** Berg Balance Scale and **3rd tool:** Hendrich II Fall Risk Model. **Results:** 59.8% of elderly had unsatisfactory total knowledge. And 40.2 of them had satisfactory total knowledge regarding balance disorders and falls. Related to reported practices about Berg balance scale, about 84.4 % of elderly had impairment of balance, also 15.6 % of them had acceptable balance performance, and no one elderly had good balance performance, 10.4% of elderly had no risk of fall. And 89.6% had high risk of fall. **Conclusion**: The current stucdy concludes that, more than one half of elderly had unsatisfactory total knowledge. While, less than one fifth of them had acceptable balance performance. And no one elderly had good balance performance. Also, the minority of the studied elderly had no risk. And the majority of them had high risk. Also, there was no significant correlation between elderly total knowledge and berg balance scale. In addition, there was no significant correlation between elderly total knowledge and reported practices about Hendrich II fall risk model. **Recommendations:** Implement health educational program for elderly about fall prevention measures and perform balance exercise regularly.

Key words: *Balance Disorders, Berg Balance Scale, Elderly, Hendrich II Fall Risk Model*

Introduction

Population ageing is a defining global trend of our time, people are living longer, and more are older than ever before. Spectacular improvements in health and survival and reductions in fertility have driven this momentous shift, which has begun or is expected to begin soon in all countries and areas. While the shift towards older populations is largely irreversible, collective actions and policy decisions shape its path and consequences. *(United Nation, 2023).* The ability to keep balance is a remarkably complex process that allows for rapid and precise changes to prevent falls with multiple systems involved, such as musculoskeletal system, the central nervous system and sensory system *(Xing et al., 2023).* Problems with balance can have a huge impact on both physical health and mental health, as balance disorders can interfere with the ability to exercise, socialize, and get from place to place. Approximately one in five elderly people experience difficulties with dizziness or balance, and falling is the leading cause of injury in people aged 65 and older *(Amanda, 2022).*

Falls are the main contributor to both fatal and nonfatal injuries in elderly individuals as well as significant sources of morbidity and mortality, which are mostly induced by impaired balance control. And it's the leading cause of accidental death and the 7th leading cause of death in people ≥ 65 years. In 2018, there were 32,522 fall deaths in people ≥ 65 versus 4,933 in those younger; thus 85% of deaths caused by falls occur in the 13% of the population who are ≥ 65 *(National Safety Council, 2020)*. In addition, falls were responsible for over 3 million emergency department visits in older people. Medical costs for nonfatal fall injuries were about $50 billion in 2018 and will surely increase *(Centers for Disease Control and Prevention, 2023)*.

Falls among older adults tend to have a multifactorial etiology related to risk factors intrinsic to the elderly. The value of a scientifically validated fall risk assessment tool is to identify the risk factors that matter so that the care team can work with the elderly to address the underlying conditions that put them at risk of falling, it's important to reject the ageism bias that people fall simply because they are older; underlying fall risk factors such as depression, polypharmacy, or gait/balance issues can be mitigated to support safe mobility and independence for adults as they age. Fall risk assessment tools are often used only on hospital admission or infrequently during an illness or in the primary care management of an individual, a best practice approach incorporates use of the Hendrich II Fall Risk Model, which is quick to administer and provides a determination of risk for falling based on gender, mental and emotional status, symptoms of dizziness, and known categories of medications increasing risk (**Ann Hendrich, 2022**).

Fall prevention education (FPE) is one of the strategies that is an inexpensive, less activity involvement and helpful tool for reducing fall occurrences. Evaluating older individuals' knowledge deficits is the initial step to implement individualized and appropriate instruction, elderly often not aware of their own fall-risk or may realize their risk of falling but they have short of knowledge on how to prevent falls. In addition, it is essential that initiation of awareness begins with education. It will evidently improve the awareness and knowledge of older adults in recognizing their fall threats so that early preventions can be prioritized. Furthermore, evaluating older individuals' knowledge deficits is the initial step to implement individualized and appropriate instruction. Providing FPE also enhances positive health care outcomes in older individuals (**Mei Fong Ong et al., 2021**).

Gerontological nurse has an essential role in effective management of balance disorders and fall problems usually involved the collaborative of multidisciplinary team, in addition to the active participation of the elderly and their caregivers. Nevertheless, the nurse is an important member to initiate and coordinate activities to promote balance. Meanwhile, geriatric nurse should be aware of clinical manifestations, types and complications of balance disorder, as well as focus on safety and promoting independence (**Black and Mataassarin, 2018**).

Significance of the study

Balance disorders generate a significant healthcare burden due to the rise in hospitalization, morbidities, and mortalities in the elderly population (**Nguyen et al., 2017**). Balance disorders are one of the most important reasons leading to falls (**Perera et al., 2019**). According (**WHO, 2021**) fall is inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects. And about a third of older adults fall each year; at age 70 or older, the percentage ranges from 32% to 42%.

According to (**The Egyptian Ministry of Health and Population, 2023**) indicated in a press statement that senior citizens aged above 60 years would make up 13.8 percent of the population whose average age would be 29.7 by 2050. The Egyptian census is carried out every 10 years the last one was in 2016. The percent of elderly was 4.4% in 1976, 5.75% in 1996, and rising to 6.27% in 2006, and 6.9% in 2016. The percentage is projected to be 9.2% in 2021, and it is expected to reach 20.8% in 2050 (**Sweed, 2016**).

Many older adults experience problems with balance. Problems can be caused by certain medications, balance disorders, or other medical conditions, that associated with factors of falls among older adults includes impaired balance ability, less physical activity, cognition impairment, mild and moderate depression. Maintaining good balance and learning about fall prevention can help get around, stay independent, and carry out daily activities. So it is essential to do health intervention program to improve balance disorders and prevent falls for elderly.

Aim of the study

The aim of this study was to assess elderly awareness regarding balance disorders and falls prevention through the following objectives:

1- Assessing the knowledge of elderly regarding balance disorders and fall.

2- Assessing the elderly reported practice regarding berg balance scale and hendrich II fall risk model.

3- Appraising the relation between elderly total knowledge, reported practices about berg balance scale and hendrich II fall risk model.

Research Questions:

Q 1 –What are elderly knowledge regarding balance disorders and fall?

Q 2 –What are elderly reported practice regarding berg balance scale and Hendrich II Fall Risk Model?

Q 3 –Is there a relation between elderly total knowledge, reported practices about berg balance scale and hendrich II fall risk model?

SUBJECTS AND METHODS

Research design:

A descriptive design study was applied to achieve the aim of the current study.

Research setting:

The study was conducted in Ear, Nose & Throat (ENT) and Internal medicine outpatient clinics (now become cardiothoracic clinic) at Elsalam hospital, Port Said City.

➢ **Sample:** Purposive sample was used in this study according to:

➢ **Inclusion criteria:**

1- Aged 60 years and above from both sexes

2- Had a risk of fall

3- Prior experience of a chronic disease.

4- Able to walk at least 10 meters long

5- Accept to participate (provide informed consent)

➢ **Exclusion criteria:**

1- Elderly with mental disorders.

2- Experience of postural hypotension

3- Elderly had previous hip replacement surgery or previous history of lower extremities fracture in the last 12 months.

Tools for data collection

The data of this study were collected by using three tools:

1st tool: An interviewing questionnaire; it was developed after reviewing related litrature and it included 3 parts:

Part 1: Elderly demographic characteristics: It includes 9 questions such as: Gender, age, marital status, educational level, current work, source of income, ……etc.

Part 2: Elderly medical history (Past and present): - Past history includes 10 questions such as: Suffer from any family history for certain disease?, If yes, what type of disease?, enter hospital the last year, reason of entering hospital, face any fall at the last 12 months,…..etc.

- Present history includes 11 questions such as: Suffer from certain diseases, If yes, what type of disease, Taking any medications now, If yes, what medications, taking medications regularly, smoking, practicing sports regularly,…..etc.

Part 3: Assess elderly knowledge:

A) Balance disorders it includes 9 questions such as: Meaning, causes, symptoms, signs and risk that need physician counseling, predisposing factors to keep elderly balance,……etc.

B) Fall prevention it includes 9 questions such as: Meaning, causes, symptoms and signs, complications of fall,…..etc.

Scoring system for knowledge:

The scale contains 18 questions, each item was assigned as the following:

2 = Complete correct

1 = Incomplete correct

0 = Don't known.

The total score for the elderly knowledge was calculated by the addition of the total score. Elderly's total knowledge score was classified as the following:

Total scores of knowledge =18 questions =36 grades = 100%

-Satisfactory knowledge when total score was ≥ 50% (≥ 18 grades).

-Unsatisfactory knowledge when the total score was< 50% (< 18 grades).

2nd tool: Berg Balance Scale developed by (Berg et al., 1992): this scale measures reported practices about balance in elderly, it was observed and scored by the researcher. The scale contains 14 items as: Sitting to standing, standing unsupported, sitting unsupported, standing to sitting, transfers, standing unsupported with eyes closed, standing unsupported with feet together,….etc.

Scoring system for Berg Balance Scale:

The scale contains 14 items, each item was assigned as the following:

0 = Unable to do the task

1= Maximum assist need

2= Moderate assist need

3= Minimum assist need

4= Independent (ability to finish the task without assistance).

The maximal global score of the scale was 56 points.

The total score of elderly calculated as follows:

0 to 20 means an impairment of balance and had a high risk of fall.

21 to 40 means acceptable balance performance.

41 to 56 means good balance performance.

3rd tool: **Hendrich II Fall Risk Model:** this model measures reported practices about falls, it was adapted and modified from the original by **(Hendrich et al., 2007)** and was observed and scored by the researcher. It consists of the following eight items:

Scoring system for Hendrich II Fall Risk Model:

Confusion /disorientation / impulsivity (0 mean unconfused to 4 mean confused), symptomatic depression (0 mean un depressed to 2 mean depressed), altered elimination (0 mean normal elimination to 1 mean urinary incontinence), dizziness or vertigo (0 mean no history of dizziness or vertigo to 1 mean have history of dizziness or vertigo), male gender (0 mean women gender to 1 mean male gender), any administrated of antiepileptic (0 mean no history of taking antiepileptic to 2 mean had history of taking antiepileptic), any administrated of benzodiazepines (0 mean no history of taking benzodiazepines to 1 mean had history of taking benzodiazepines), and The get-up-and-go test assessing four items as: ability to rise in single movement- no loss of balance with steps (receives score of 0), pushes up , successful in one attempt (receives score of 1), multiple attempts, but successful (receives score of 3) and unable to rise without assistance during rest, (receives score of 4).

The elderly total reported practices abour fall-risk score for the Hendrich II Fall Risk Model (HIIFRM) ranged from 0 to 20 as the following:

- The elderly who took ≥ 5 considered high risk of fall.
- The elderly who took < 5 considered no risk for fall.

Validity:

The tools validity was done by five of Faculty's staff Nursing experts in the field of Community Health Nursing, Faculty of Nursing, Helwan University and Specialties who reviewed the tools for clarity, relevance, comprehensiveness, applicability, and reliability.

Reliability

To assess reliability, the study tools were tested by the pilot subjects at first session and retested after 2 weeks as test-retest reliability for calculating Cronbach's Alpha coefficient test which revealed that each of the three tools consisted of relatively homogenous items as indicated high reliability of each tool. Cronbach's Alpha of knowledge was 0.91, Berg balance scale was 0.984 and 0.894 for the Hendrich II Fall Risk model.

Ethical considerations:

An official permission to conduct the proposed study was obtained from the Scientific Research Ethics Committee, Faculty of Nursing, Helwan University. Participation in the study is voluntary and subject was given complete full information about the study and their role before signing the informed consent. The ethical considerations were included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it was not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

Pilot study:

The pilot study was carried out on 10% (7) of the sample to examine the clarity of questions and time needed to complete the study tools consumed about 15-20 minutes. Based on the results of pilot study no modifications were done. So subjects of the pilot study were included in the main study sample.

Fieldwork: conducted through two phases:

Phase I:

Tools for data collection development based on review of the past & current related literature covering various aspects of the study by using available books, periodical articles and magazines. The aim is to get acquainted with the research problem to develop the study tools. In this phase the researcher met eldedrly, who met the inclusion criteria. Subjects involved on the study were interviewed, assessed and informed that the time for collect the data was through two times. Acquaintance sessions, the researcher introduced himself to elderly who agreed to be included in this study. In order to gain their trust, cooperation and confidence. Voluntary participation and confidentiality were assured by the researcher for each elderly through clarifying that all information will be used for scientific research only.

Phase II:

There was a working phase, the researcher visited the selected setting two times per week on Sunday and Mondays from (10 am to 1 pm), from from beginning of December 2021 to end of May 2022. Elderly were divided into 22 groups, each group consists of average 1-2 elderly, and each group took 1-2 week. The researcher explained the purpose of the study and distributing the tool to the eldedrly.

Statistical analysis:

The collected data were organized, tabulated and analyzed using appropriate statistical test. The data were analyzed by using the Statistical Package for Social Science (SPSS) version 24, which was applied to calculate frequencies, percentages, mean and standard deviation, as well as test statistical significance, associations by using Chi-square test (x2), is a test used to study association between two qualitative variables, and matrix correlation to detect the relation between the variables for (p value). It considered as follows: Highly statistically significant p< 0. 001, statistically significant when p < 0.05 and not significant when p> 0.05.

Results:

Table (1): Indicates that, 63.6 % of studied elderly were males, 53.2 % of them their ages were more than 65 years, the mean age of elderly were 68.5 ±6.7 year. Related to marital status, 46.8 % of the elderly were married. According to elderly's education, 46.8% of them were having basic education and 55.8 % of them not working. In addition, 44.2 % of the elderly their source of income were pensions and 58.4 % of them their income not enough. According to living with 46.8 % of them were livings with their husbands/wife.

Figure (1): Illustrates that, 56% of elderly visited the cardiothoracic clinic. And 44% of them visited the ear-nose &throat clinic.

Table (2): Shows that, 35.1 % of the elderly had suffered from certain disease in family history. 63% of the elderly had suffered from tumors and 85.2 of them had diabetes. According to enter the hospital during last year, 58.4% of them didn't enter hospital. 50.0% of them had entered the hospital for medication and 6.2% of them had entered the hospital for surgery. According to fall during the last 12 months, 59.7% of them falled at the last 12 months, 52.2 of them falled once, 76.1% of elderly who falling had ability to standup alone. 80.4% of them injured due to falling.

Table (3): Indicates that, 57.1% of the elderly suffer from certain diseases. 88.6% of them suffered from hypertension, 97.4% of them take medications now. 34.7% of them take heart medications and 61.3% of them take anticoagulants medication. 64.9% of the elderly take their medications regularly. 54.5% of them currently non-smokers. 100% of the elderly`currently didn`t practice any sports regularly, 66.2% of the elderly lose their balances even if they didn`t fall and 70.6% of them stopped current activities due to loss of balance. 57.1 % of them had the ability to care of themselves.

Figure (2): Illustrates that, 59.8% of elderly had unsatisfactory total knowledge. And 40.2 of them had satisfactory total knowledge.

Figure (3): Reveals that, 84.4 % of elderly had impairment of balance. While 15.6 % of them had acceptable balance performance. And no one elderly had good balance performance.

Figure (4): Shows that, 10.4% of elderly had no risk. And 89.6% had high risk.

Table (4): Shows that, there no correlation between elderly total knowledge and Berg balance scale. In addition, there was no correlation between elderly total knowledge and reported practices about Hendrich II fall risk model.

Table (1): Frequency Distribution of Elderly regarding Demographic Characteristics (n=77)

Demographic characteristics	No	%
Gender		
Male	49	**63.6**
Female	28	36.4
Age (Years)		
60 – 65	36	46.8
> 65	41	**53.2**
Mean ±SD	68.5 ±6.7	
* Marital Status		
Married	36	**46.8**
Widowed	24	31.2
Divorced	17	22.1
Educational level		
No read and write	4	5.2
Basic education	36	**46.8**
Secondary education	24	31.2
University education or higher	13	16.9
Currently work		
Yes	34	44.2
No	43	**55.8**
Source of Income		
Pension	34	**44.2**
Children assistance	8	10.4
Current work	31	40.3
Relative's assistance	4	5.2
** Monthly income		
Not enough	45	**58.4**
Enough	32	41.6
The elderly living with		
Husband / Wife	36	**46.8**
With children	18	23.4
Alone	23	29.9

* None of elderly were single   ** None of elderly had enough and save income
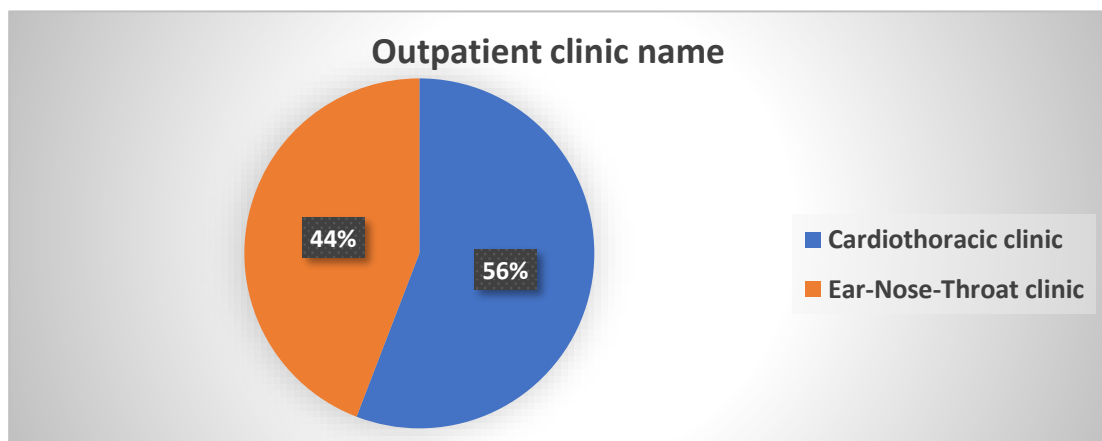

Figure (1): Percentage Distribution of the Elderly according to outpatient attendance (n=77)

Table (2): Frequency Distribution of Past History for the Elderly (n=77)

Past history items	No	%
Family history of chronic diseases		
Yes	27	**35.1**
No	50	64.9
***If yes, do you suffer from: (n=27)**		
Tumor	17	63.0
Hypertension	15	55.6
Diabetes	23	85.2
Admission the hospital during last year		
Didn't enter	45	**58.4**
Once	6	7.8
Twice	9	11.7
Three times	17	22.1
Reason of hospital admission(n=32)		
Diagnosis	14	43.8
Medication	16	**50.0**
Surgery	2	6.2
Fall during the last 12 months		
Yes	46	**59.7**
No	31	40.3
If yes,		
Number of falls (n=46)		
Once	24	**52.2**
Twice	17	37.0
Three times	3	6.5
Four times	2	4.3
Ability to standup alone		
Yes	35	**76.1**
No	11	23.9
Fall injury		
Yes	37	**80.4**
No	9	19.6
Fear of fall again		
Yes	41	**89.1**
No	5	10.9
Environment cause of falling		
Yes	43	**93.5**
No	3	6.5

* The elderly have more than one family history of disease

Table (3): Frequency Distribution of Present History for the Elderly (n=77)

Present history items	No	%
Suffer from certain diseases		
Yes	44	**57.1**
No	33	42.9
***If yes, what kind of disease? (n=44)**		
Hypertension	39	**88.6**
Diabetes	36	81.8
Heart diseases	25	56.8
Arthritis	24	54.5
Renal failure	11	25.0
Take medications		
Yes	75	**97.4**
No	2	2.6
***If yes, Types of medications (n=75)**		
Heart medications	26	**34.7**
Hypertension medications	39	52.0
Diabetics	35	46.7
Anticoagulants	46	**61.3**
Pain killers	6	8.0
Bronchodilators	26	34.7
Take medications regularly		
Yes	50	**64.9**
No	27	35.1
Specific habits: Smoking		
Yes	35	45.5
No	42	**54.5**
Practice sports regularly		
Yes	0	0.0
No	77	**100.0**
Have you lost your balance, even if you didn't fall or get injured		
Yes	51	**66.2**
No	26	33.8
If yes, stop current activity due to loss of balance (n=51)		
Yes	36	**70.6**
No	15	29.4
The ability to take care of yourself		
Yes	44	**57.1**
No	33	42.9
If not, who cares about you (n=33)		
Husband / Wife	17	51.5
Children	9	27.3
Relatives	7	21.2

* The elderly have more than one response

In relation to research question number (1) What are elderly knowledge regarding balance disorders and fall?
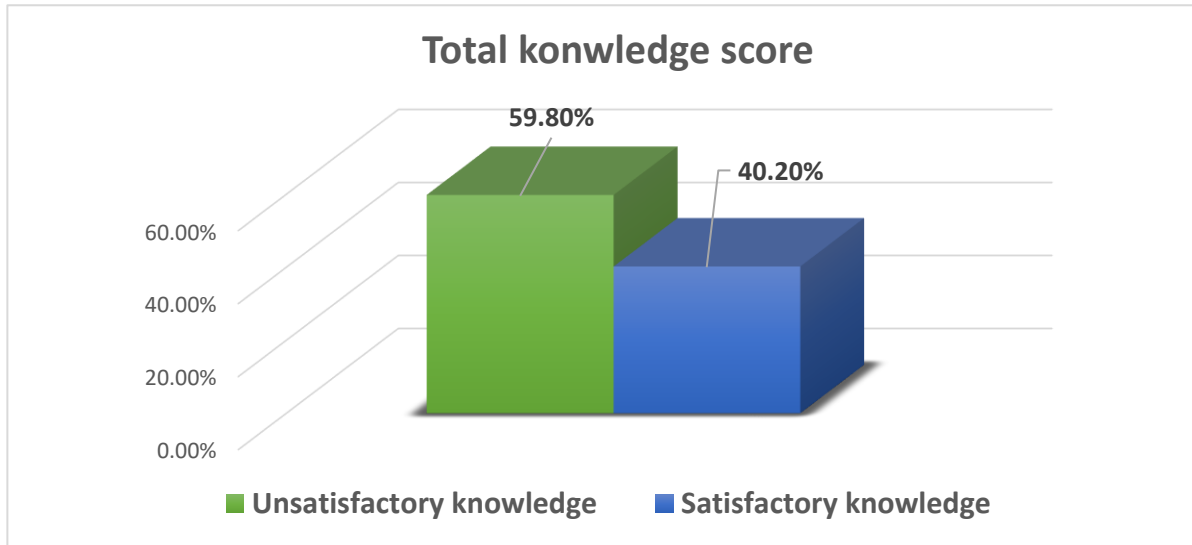

Figure (2): Percentage Distribution of the Elderly according to Total Knowledge Score (n=77)

In relation to research question number (2) What are elderly reported practice regarding berg balance scale and Hendrich II Fall Risk Model?
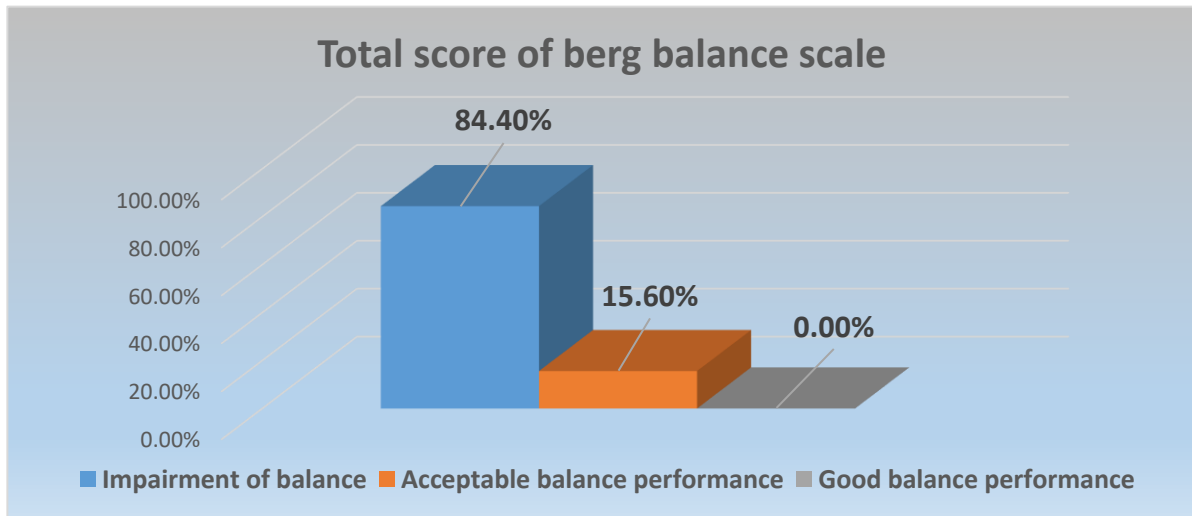

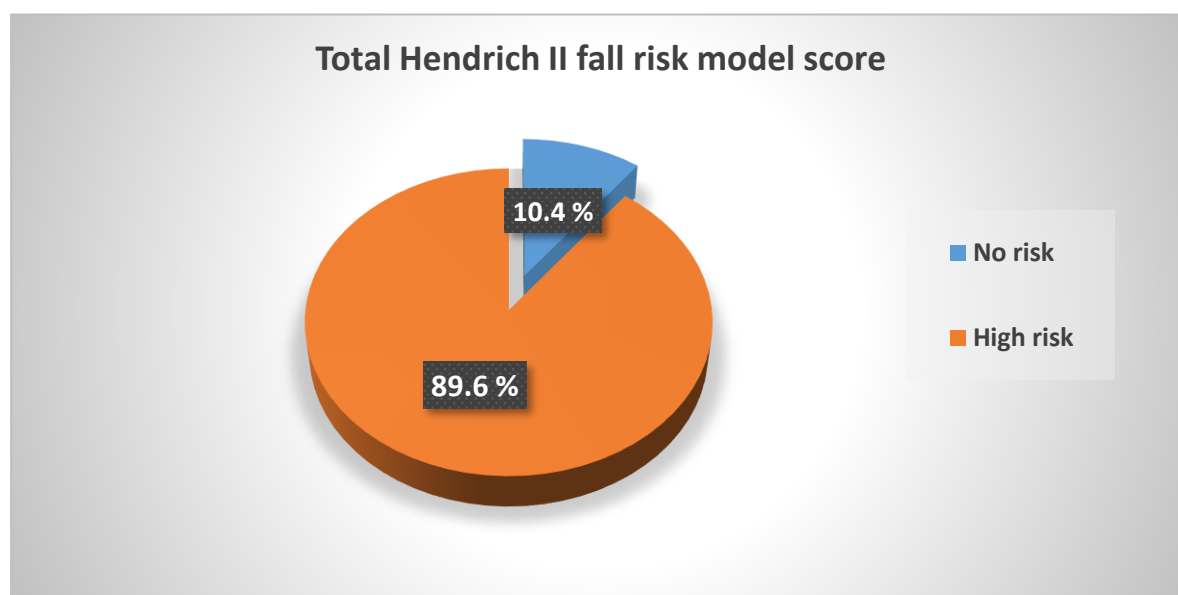**Figure (3): Percentage Distribution of the Elderly Total Score of Berg Balance Scale (n=77)**

Figure (4) Percentage Distribution of the Elderly according to total Hendrich II Fall Risk Model score (n=77)

In relation to research question number (3) Is there a relation between elderly total knowledge, reported practices about berg balance scale and hendrich II fall risk model?

Table (4): Correlation between Elderly Total Knowledge, reported practices about Berg Balance Scale and Hendrich II Fall Risk Model (n= 77)

Variables	Total Knowledge	
	R	**P- value**
Berg Balance Scale	0.055	0.632
Hendrich II Fall Risk Model	0.060	0.602

r = Person correlation coefficient

DISCUSSION

Falls are major issues affecting the elderly with potentially serious complications, including fractures, head injury, institutionalization, fear of falling and depression **Alex et al. (2020).** Fall is defined as suddenly coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects **Değer et al. (2019).**

Balance disorders are important reasons leading to fall and increases the possibility of death and disability; furthermore, it may cause the loss of independence. Therefore, balance disorders in elderly individuals are a symptom that leads to functional insufficiency **Gamage et al. (2019).** Detection of the level of impaired postural control is important for the assessment of risk of falling, as well as for the evaluation of proper treatment **Dunsky et al. (2017).**

Part (I): Demographic characteristics of elderly:

The finding of the present study revealed that, more than two thirds of elderly were males **(Table 1)**. This study was in the same direction with **Martins et al. (2020)** in Portugal, who conducted study entitled "Effects of a "modified" Otago exercise program on the functional abilities and social participation of older adults living in the community" (n = 34) and found that 76.47% of the studied elderly were males.

While disagreed with **Khumpaneid et al. (2022)** in Thailand, who conducted study titled "Effects of modified-Otago exercise program on four components of actual balance and perceived balance in healthy older adults" (n = 16) and reported

that 93.75% of the studied elderly were female. From the researcher point of view, this result may due to increase prevalence rate in elderly women because they have a consequence of the decline in their bone mass that occurs faster than that of males especially after menopause.

Concerning age, the present results clarified that, more than half of the studied elderly were more than 65 years. This result was in agreement with *Cao et al. (2021)* in Canada, who conducted study entitled "Association of balance function with all-cause and cause-specific mortality among US adults" (n= 5816) and found that 61.9% of the participants were aged 65 years or older. From the researcher point of view, this result may due to increased prevalence of this disease in this age group and chronic diseases more common (hypertension, diabetes and dementia) that need polypharmacy and may elderly forgotten their treatment or repetition of it which led to increase risk factors to loss of balance and fall.

Regarding to the income, the current results showed that, less than half of the studied elderly their main source of income were pensions. While, nearly two thirds of them mentioned that their income was not enough. This result in line with *Mansour (2021)* in Egypt, who conducted study entitled "The information needs and behavior of the Egyptian elderly living in care homes" (n=63) and found that, 28.6% of participants was labelled as average-income people, where they were paid E£1501–2000 (Egyptian pounds) per month through monthly pensions.

While disagreed with *Abd Allah et al. (2021)* in Egypt, who conducted study entitled "Factors Affecting Medication Adherence among Elderly in Rural Areas" (n= 120) and reported that, 56.7% of the studied elderly had sufficient income.

Also, the current result in agreement with *Nassar et al. (2019)* in Egypt, who conducted study entitled "Vulnerable older populations without special health care in Egypt: A need for assessment & reform" (n = 53) and reported that 71.3% mentioned that one of the main problems that elderly people might face is the decreased income due to inability to work, pensions, or lack of skills and competency to keep up with the changing work requirements. This result may be due to the fact that the pensions for the Egyptian elderly are not in line with the conditions of the rising prices in Egypt.

Part (II): Medical history (past and present):

Related to past history for the elderly, more than one third of the studied elderly mention they suffer from certain diseases in family history, and the majority of those elderly suffer from diabetes, and half of them enter hospital for taking medication **(Table 2)**. This findings in the same line with *Boongird et al. (2017)* in Thailand, who conducted study entitled "Effects of a simple home-based exercise program on fall prevention in older adults: A 12-month primary care setting, randomized controlled trial" (n=439) and found that 74.4% suffering from hypertension, 37.9% suffering from diabetes, 57.9% suffering from osteoarthritis. From the researcher point of view, these results are due to normal physiological functions changes that associated with aging process and may be due to genetic factors.

The current results showed that less than two thirds of the studied elderly fall during the last 12 months, and more than half of elderly were fall once. While more than three quarters of them were able to stand up alone and majority of them had injury from fall and majority of them fear from fall again. These findings were inconsistent with the study by *Martins et al. (2020)* who reported that 58.82% of the study sample didn't had history of falls in the last 12 months, 85.29% had fear of falling, and 73.53% use upper extremities assistance to stand from a chair. From the researcher point of view, this result might be because of the studied elderly related chronic diseases such as hypertension, diabetes and due to change in gait regarding aging process that make them easy to expose falling, also due to lack of knowledge about surrounding environment modifications to consist with the elderly to prevent falls.

This rational in line with *Mohammed et al. (2019)* In Egypt, who conduct a study entitled "Effect of a fall prevention program for elderly persons attending a rural family medicine center" (n= 100) and found that home modifications included removal of tripping hazards 62%, installing grab bars next to the toilet and in the bathtub or shower 5%, using non-slip mats in the bathtub and on shower floors 43%, putting handrails on both sides of stairways 16% and improving home lighting 36% may be effective in reducing falls.

Related to present history for the elderly, more than half of the studied elderly mention they suffer from certain diseases, and the majority of elderly suffer from hypertension **(Table 3)**. This result was supported by ***Mohamed et al. (2021)*** in Egypt, who conducted a study entitled "Otago exercise program: a golden technique on health status and risk of falls among older adults with chronic diseases" (n= 48) and found that 60.4% of incidence chronic disease among studied elderly was hypertension. From the researcher point of view, this result may be due to normal physiological aging changes, unhealthy lifestyle and stressors.

Concerning loss of balance, more than three fifths of the studied elderly were losing their balance even if they didn't fall and they stopped doing things due to loss of balance. This result in the same line with ***Sapmaz and Mujdeci, (2021)*** in Turkey who conducted a study "The effect of fear of falling on balance and dual task performance in the elderly" (n= 60) and reported that 36.7% of studied elderly mentioned they had history of loss balance without fall incidence in the past year. From the researcher point of view, this result may be due to changes in gait due to aging process.

Concerning the ability to take care of herself, more than half of the studied elderly had the ability to take care of themselves, and more than half of them receive their care from their wives/ husbands. This result was supported by ***Lotfalinezhad et al. (2022)*** in Iran, who conducted study entitled "Design, implementation and evaluation of informal home care support intervention program for lonely older adults in the community" (n = 32) and said that 56.4% of the studied elderly were able to care of themselves. From the researcher point of view, this result may be due to loss of motor function related to normal aging process.

In relation to research question number (1) What are elderly knowledge regarding balance disorders and fall?

Part (III): Knowledge of elderly about balance disorders and fall:

In relation to elderly total knowledge regarding balance disorders and fall, the current study indicated that, more than one half of elderly had unsatisfactory total knowledge. And less than one half of them had satisfactory total knowledge **(Figure 2)**. This result in agreement with **Ismail et al. (2018)** in Egypt, who conducted study entitled "Risk of falls and effect of a health education program in prevention of falls among elderly in geriatric homes in Cairo, Egypt" (n = 120) and revealed that, two third of elderly had unsatisfactory total knowledge. And one third of them had satisfactory total knowledge

In relation to research question number (2) What are elderly reported practice regarding berg balance scale and Hendrich II Fall Risk Model?

Part (IV): Elderly reported practices about Berg balance Scale:

Concerning total score of berg balance scale, the present study reveals that, the majority of the studied elderly had impairment of balance pre intervention program. While, less than one fifth of them had acceptable balance performance. And no one elderly had good balance performance **(Figure 3)**. This result was in agreement with **Mohammed et al. (2019)** in Egypt, who conducted a study entitled "Assess the effect of exercises program on balance and prevention of recurrent falling among elderly people" (n=80) and revealed that, the balance scores were (15%) in first observation.

Part (V): Elderly reported practices about Hendrich II fall risk model score:

According to the total score of Hendrich II fall risk model, the minority of the studied elderly had no risk. And the majority of them had high risk **(figure 4).** These findings were in accordance with **Liu-Ambrose et al. (2019)** in Canada, who conducted study entitled "Effect of a home-based exercise program on subsequent falls among community-dwelling high-risk older adults after a fall a randomized clinical trial" (n= 172) and found that, the majority of elderly had high risk.

In relation to research question number (3) Is there a relation between elderly total knowledge, reported practices about berg balance scale and hendrich II fall risk model?

Part (VI): Relation and correlation between studied variables:

Concerning relation between total knowledge with Berg Balance Scale and the Hendrich II fall risk model, the current study presented that, there was no significant correlation between elderly total knowledge and berg balance scale. In addition, there was no significant correlation between elderly total knowledge and reported practices about Hendrich II fall risk

model. **(Table 4)**. This result was in accordance with ***Goh et al. (2022)*** in Canada, who conducted study entitled "Effects of falls prevention education on related knowledge gain and behaviour changes among older adults" (n=52) and reveled that there was no significant correlation between the studied sample knowledge and their balance improvement and no significant correlation with fall risk reduced score.

Conclusion

Based on the study finding and research questions. **It can be concluded that:**

In relation to elderly total knowledge regarding balance disorders and fall, more than one half of elderly had unsatisfactory total knowledge. In addition, according to total score of berg balance scale, the majority of the studied elderly had impairment of balance. While, less than one fifth of them had acceptable balance practice. And no one elderly had good balance practice. Also according to the total score of Hendrich II fall risk model, the minority of the studied elderly had no risk. And the majority of them had high risk. Concerning relation between total knowledge with Berg Balance Scale and the Hendrich II fall risk model that, there was no significant correlation between elderly total knowledge and berg balance scale and reported practices about Hendrich II fall risk model.

Recommendations

On the basis of the result of the study, the following recommendations' are suggested

1. Implement health educational program for elderly about fall prevention measures and perform balance exercise regularly.
2. Make posters and booklets about balance importance and fall prevention to be available at outpatient clinic, Elsalam hospital.
3. Further studies are needed for elderly in a large sample and in another setting about balance disorders and prevent falls.

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