Relationship between Visual Functioning, Balance, and Fear of Falling among Community-dwelling seniors with Cataract

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Abstract

The most prevalent visual problem among community- dwelling seniors is cataract; it is typically results in progressive visual functioning changes such as decreased in visual acuity, peripheral vision, depth perception, contrast sensitivity and colors discrimination, and increased sensitivity to glare exposure. As a result, it impairs movement and balance; seniors with impaired balance more likely to fall and suffer the physical, psycho-social, and economic consequences, lowering their quality of life. **Objective:** To identify the relationship between visual functioning, balance, and fear of falling among community-dwelling seniors with cataract. **Setting:** Outpatient clinics affiliated to the General Ophthalmology Hospital, previously Farouk Hospital, in Alexandria, Egypt. **Subjects:** A purposive sample of 100 community-dwelling seniors diagnosed with cataract. **Tools:** Four tools were used for data collection: Socio-demographic and Clinical data of Community-dwelling seniors with Cataract Structured Interview Schedule, The Visual Function Index (VF-14), The Berg Balance Tests (BBT), and The Short Falls Efficacy Scale-International (SFES-I). **Results:** The studied community-dwelling seniors with cataract were found to possess moderate levels of visual impairments, fall risks, and fall concerns (61.0%, 49.0%, and 42.0%, respectively). Furthermore, a statistically significant positive correlation between the study participants visual functioning and their balance ($x^2 = 35.773$ ^{MC}p = <0.001). The visual functioning of the study participants was correlated with their fear of falling, but the difference was not statistically significant ($x^2 = 3.671$ ^{MC}p = 0.458). Moreover, their balance was positively correlated with their fear of falling, and the difference was statistically significant ($x^2 = 19.141$ ^{MC}p = 0.001). **Conclusion:** Visual functioning and balance were revealed to have statistically significant positive relationship among community-dwelling seniors with cataract; additionally, their balance was positively connected with their fear of falling. On the other hand, their visual functioning was not significantly correlated with their fear of falling. **Recommendations:** For community-dwelling seniors with cataract, ongoing assessment is required to evaluate their level of visual functioning and balance; this will assist gerontological nurses in providing appropriate nursing interventions to lessen and prevent fear of falling and its adverse consequences.

Keywords: visual functioning, Balance, Fear of falling, Community-dwelling seniors, Cataract.

Introduction

The sensory system, particularly vision, is one of the first systems to be affected by the ageing process. Visual impairment is a significant health issue and a major cause of injuries in older adults. In general, vision becomes progressively worse after the age of 50 **(Voleti & Hubschman, 2013; Aljied et al., 2018)**. Functional vision changes are common with ageing, such as a reduction in visual acuity, peripheral vision, depth perception, contrast sensitivity & colors discrimination, and increased sensitivity to glare exposure **(Saftari & Kwon, 2018; Erdinest et al., 2021).**

In addition to normal physiological changes, older people are particularly vulnerable to common eye problems **(Moghadam et al., 2015)**. The most prevalent visual problem among community- dwelling seniors is cataract, which is the partial or complete clouding of the normally clear and transparent lens. Cataract typically results in progressive vision loss with medical, social, and economic consequences; it is also a frequent cause of age-related blindness **(Mencucci et al., 2023)**.

It is estimated that 95 million people worldwide suffer from cataract **(Liu et al., 2017)**. Another study revealed that, in patients aged 50 and older, cataract was the most common cause of blindness worldwide in 2020 **(Global Burden of Disease (GBD), 2021)**. **The World Health Organization (WHO)** predicts that with population growth and progressive ageing in

future years, there will be an increase in visual impairment attributable to cataract (**WHO, 2019**). In Egypt, 47.9% of older adults over 65 have poor vision, with cataract being the major cause of blindness (54.8%) (**Mohamed et al., 2011**).

With ageing, the visual system becomes more crucial for maintaining postural stability and control. Balance is regulated by the visual system, the vestibular system, and the proprioceptive system. The loss or reduction of vision associated with cataract can affects mobility and balance as a result of the altered depth perception and can interfere with the equilibrium of community-dwelling seniors (**Aljied et al., 2018**).

Community-dwelling seniors with balance impairment are more at risk for falls and its consequences (**Mihailovic et al., 2020**). Falls can cause serious musculoskeletal injuries that may lead to functional limitation, permanent disability, institutionalization, or even mortality. It represents a significant societal problem due to its association with decreased physical function and psycho-social effects such as fear of falling, depression, and anxiety among older adults (**Park, 2018**).

Fear of falling (FOF) is called ptophobia, which describes a phobic response to standing or walking as well as decreases in balance self-efficacy, self-confidence, nervous anticipation of falling, and harmful activity avoidance as a result of FOF. Fear of falling causes limitations in the performance of daily activities, worsens physical function, and has a negative impact on the quality of life (**MacKay et al., 2021**).

As a result, community-dwelling seniors with poor vision tend to reduce their fundamental, essential everyday tasks. It is stated that the existence of visual alterations, whether the issue is with visual acuity, contrast, glare sensitivity, or depth perception, increases morbidity and mortality in elderly patients with cataract. Community-dwelling seniors with vision impairments also report trouble completing everyday activities like going for walks, getting out of bed and laying down, and getting up from and seating in seats (**Lee et al., 2022; Mencucci et al., 2023**).

The Gerontological nurse has an important role in improving the quality of life of community-dwelling seniors with cataract by encouraging them to have an annual eye examination for assessment and early detection of the negative consequences of this problem such as impaired mobility, balance, and fear of falling. Moreover, they should provide educational interventions to help seniors have a healthy lifestyle (**Mohamed et al., 2018; Mencucci et al., 2023**). Therefore, this study aimed to identify the relationship between visual functioning, balance, and fear of falling among community-dwelling seniors with cataract.

Aim of the study:

The present study aimed to identify the relationship between visual functioning, balance, and fear of falling among community-dwelling seniors with cataract.

Research Question:

Is there a relationship between visual functioning, balance, and fear of falling among community-dwelling seniors with cataract?

Research design:

The present study followed a descriptive-correlational research design, which strives to describe the association between two or more variables without establishing a cause-and-effect relationship.

Study setting:

The research was conducted at the General Ophthalmology Hospital, previously Farouk Hospital, in Alexandria, Egypt. The hospital is linked with Egypt's Ministry of Health. All ophthalmologic problems are treated at the facility. The hospital has one male and one female ophthalmology clinic. It also features a glaucoma clinic and a clinic for children. There is also an optical clinic, moreover, there is one laser room and one for minor surgeries and the hospital has inpatient building. This research was conducted in outpatient clinics that are open from 9 a.m. to 1 p.m. every day except Friday.

Study subjects:

The study subjects were chosen using the purposive sampling technique and included one hundred (100) community-dwelling seniors aged 60 years and older, able to communicate effectively, diagnosed with cataract, no history of ophthalmic surgeries or glaucoma, no active state of orthopedics, and no neurological disorders such as cerebral vascular stroke and/or Parkinson's disease.

The Epi info V 7.0 program was used to estimate the number of study participants who were enrolled in the study based on the following parameters:

- Population size = 85 over three months; this data was collected by the researchers through a review of outpatient clinics' attendance rates after getting permission from the hospital director.
- The expected frequency = 50%.
- The acceptable error = 5%.
- The confidence coefficient is 95%.
- The minimum sample size = 70.

Tools of data collection:

In this research, four tools were used as follows;

Tool I: Socio-demographic and Clinical data of Community-dwelling seniors with Cataract Structured Interview Schedule

This tool was developed by the researchers after reviewing relevant literature (**Mencucci et al., 2023; Mihailovic et al., 2020**); it contained the following items:

Part 1: Socio-demographic data such as age, sex, marital status, education level, occupation prior to retirement, and monthly income.

Part II: Clinical data such as current diagnosis, co-morbidities, and medications use, presence of physical impairments, and assistive devices use.

Part III: Fall history, including the number of falls in the previous year, location of falls, time of falls, major cause of falls, and trauma or injury caused by falls.

Tool II: The Visual Function Index (VF-14)

This tool is intended to assess functional impairment in cataract patients. It was developed by (**Steinberg et al.,1994**). The VF-14 has good internal consistency and is a reliable, valid tool which provides information not found in measurements of general health status or visual acuity. It is made up of 18 questions that address 14 components of visual function that are impaired by cataracts. The visual function is rated on a scale of 0 to 4, and the items are added up for a total score of "56". A score from 0-5 indicates very severe visual

impairment, a score of 6-16 severe visual impairment, a score of 17-41 moderate visual impairment, a score of 42-51 mild visual impairment, a score of 52-54 minimal visual impairment, and a score of 55-56 no visual impairment.

Tool III: The Berg Balance Tests (BBT)

BBT is a 14-item balance test developed by (**Beg et al.,1988**) that includes sitting to standing, standing unsupported, transfers, standing with feet together, standing to sitting, sitting unsupported, retrieving object from floor, standing on one leg, turning 360 degrees, standing with eyes closed, reaching forward with outstretched arm, placing alternate foot on stool, standing with one foot in front, and turning trunk. Each item is scored on a scale of 0 to 4, with "0" indicating the lowest level of function and "4" indicating the highest level of function; the maximum score is "56." A score of 0-20 indicates a high risk of falling, a score of 21-40 a medium risk of falling, and a score of 41 -56 a low risk of falling. The BBT was translated into Arabic and shown to reliable by (**Algameel, 2013**), reliability r= 0.97.

Tool IV: The Short Falls Efficacy Scale-International (SFES-I)

This tool was developed by (**Kempen et al., 2008**) and is a 7-items version of the Falls Efficacy Scale International (FES-I), which was initially developed by (**Yardley et al., 2005**). The short FES-I has been validated and recommended for community-dwelling older adults to assess their level of fear about falling during social and physical activities inside and outside the home, regardless of whether the person actually participates in the activity. The level of concern is measured on a four-point Likert scale, with 1 being not at all concerned to 4 being very concerned. To generate a total score for the Short FES-I, sum the scores from each item together a total that ranges from 7 (no concern about falling) to 28 (high concern about falling). A score of 7-8 suggests a low concern, a score of 9-13 shows a moderate concern, and a score of 14-28 indicates a high level of concern.

Method

A- Preparation of the study

1. Tool I (**Socio-demographic and Clinical data of Community-dwelling seniors with Cataract Structured Interview**

Schedule) was designed by the researchers after an extensive review of relevant literature.

2. The Arabic version of Tool III **(the Berg Balance Tests (BBT))** was used in the current study; this tool was valid and reliable by **(Algameel, 2013)**, reliability r= 0.97.

3. Tool II **(the Visual Function Index (VF-14))** and Tool IV **(the Short Falls Efficacy Scale-International (SFES-I))** were translated into Arabic and then back into English.

4. Tool I, Tool II, and Tool IV were validated by juries of five (5) experts in the study's associated fields. Their thoughts and opinions were considered. The reliability of tools II and IV was assessed using the Cronbach's alpha test; they were proven to be reliable (r = 0.890 and 0.868, respectively).

5. **B- Administrative process**

6. Approval from the Research Ethics Committee (REC), Faculty of Nursing, Alexandria University, was obtained.

7. Approval to conduct the research was requested from the responsible authorities at the Faculty of Nursing, Alexandria University.

8. Permission was acquired from the head of the study setting, who was notified about the aim of the study as well as the day and time of data collection.

C- A pilot study

9. A pilot study was carried out on ten community-dwelling seniors with cataract; they were not included in the study subjects. It was carried out in order to assess the applicability, clarity, and feasibility of the study tools as well as estimate the time required for the interview. Modifications were made as necessary.

D- Collection of data

10. Following an explanation of the research's purpose, the community-dwelling seniors with cataract who meet the eligibility requirements were interviewed individually in the study setting's waiting area.

11. Before any attempt to gather data, a rapport relationship with community-dwelling seniors was developed in order to elicit their cooperation.

12. The researchers prepared the environment so that it was calm and comfortable for each participant, with enough ventilation and lighting.

13. The researchers prepared the necessary equipment for administering the Berg Balance Tests (BBT), including a stopwatch or watch with a second hand, a tape measurement (5, 12, and 25 cm), and seats of an appropriate height.

14. The researchers used to visit the study setting three times a week, from 9 a.m. to 1 p.m.

15. In the previously mentioned setting, the study's tools were applied to community-dwelling seniors. The questionnaire took approximately 25–30 minutes to be completed. It is determined by each participant's level of comprehension and cooperation.

16. The data was collected over three months, from the first of August 2023 to the end of October 2023.

Ethical Considerations:

- Following an explanation of the study's purpose, each study subject was asked to provide informed written consent.
- The right to refuse to participate in the study was emphasized to the participants.
- The privacy of the study subjects was protected, as was the confidentiality of the data obtained.
- Subjects were assured that their participation in the study was entirely voluntary and that they could withdraw at any moment.

Statistical analysis procedure:

Following data collection, the data was coded and transferred into a specially designed format for computer feeding. The information was entered into the International Business Machine Statistical Package for Social Sciences (IBM-SPSS version

23.0).The mean and standard deviation were used to describe quantitative data. The Chi-square test (Monte Carlo correction) was used to assess group comparisons for categorical variables, and it is used to correlate between normally distributed quantitative variables. The significance of the obtained results was determined at p 0.05.

Results

Table (1) indicates socio-demographic characteristics; the study subjects' ages ranged from 60 to 87 years, with a mean of 71.82±7.68 years; 69.0% were 60 to less than75 years old, 53.0% were females, 52.0% were married, and 42.0% were illiterate. More than half (56.0%) of the study subjects were working before retirement, and 53.0% reporting that their monthly income was insufficient.

Table (2) shows clinical data and fall history of community-dwelling seniors with cataract; the majority of the study seniors (89.0%) were diagnosed with senile cataracts. Hypertension was the most common disorder (77.0%) among the study subjects, followed by diabetes mellitus (41.0%), anemia (29.0%), and heart diseases (27.0%). In terms of prescribed medications, antihypertensive pharmaceuticals were used by 77.0% of the study subjects, followed by eye drops (63.0%), hypoglycemic drugs (41.0%), vitamins (40.0%), and cardiac medications (27.0%). The table also shows that 99.0% of the study seniors had physical impairments, with 90.9% having visual problems. The majority of study participants (95.0%) used assistive devices, with 94.7% wearing medical eye glasses. The table also represents that 46.0% of the study seniors fell within the last year; 78.3% of them fell once, and the primary causes of fall were visual impairments (89.1%), sliding on the floor (54.4%), and balance concerns (17.4%). More than half of the seniors who fell (63.1%) fell in the bathrooms, while 41.3% fell on the stairs. More than two-thirds of the fallen seniors (69.6%) fell at night, with 60.9% suffering from wounds as a result of the fall, 43.5% suffering from bruises, and 30.4% suffering from bone fractures.

Table (3) reflects the levels of the Visual Function Index (VF-14), the Berg Balance Tests (BBT), and the Short Falls Efficacy Scale-International (SFES-I) in community-

dwelling seniors with cataract. The study participants had moderate levels of visual impairments, fall risks, and fall concerns (61.0%, 49.0%, and 42.0%, respectively).

Table (4) represents the correlation between the Visual Function Index (VF-14), the Berg Balance Tests (BBT), and the Short Falls Efficacy Scale-International (SFES-I) in community-dwelling seniors with cataract. According to the table, there was a statistically significant positive correlation between the study participants visual functioning and their balance ($x^2 = 35.773$ $^{MC}p = <0.001$). On the other hand, the visual functioning of the study participants was correlated with their fear of falling, but the difference was not statistically significant ($x^2 = 3.671$ $^{MC}p = 0.458$). Furthermore, the data demonstrates that the balance of the study participants was positively correlated with their fear of falling, and the difference was statistically significant ($x^2 = 19.141$ $^{MC}p = 0.001$).

Table (5) indicates the relationship between socio-demographic characteristics, clinical data, and fall history, and the Visual Function Index (VF-14) in community-dwelling seniors with cataract. According to the table, there was a statistically significant relationship between the sex of the study participants and their visual functioning ($x^2 = 7.780$ $^{MC}p = 0.019$). There were also significant relationships between the study participants' current diagnosis (senile cataract), physical disabilities (hearing problems), assistive devices (medical hearing aids), and time of falls (afternoon falling) and their visual functioning ($x^2 = 12.007$ $^{MC}p = 0.001$, $x^2 = 6.210$ $^{MC}p = 0.045$, $x^2 = 6.321$ $^{MC}p = 0.026$, respectively).

Table (6) reveals the relationship between socio-demographic characteristics, clinical data, and fall history, and the Berg Balance Test (BBT) in community-dwelling seniors with cataract. According to the table, there was a statistically significant relationship between the sex of the study participants and their balance ($x^2 = 6.322$ $^{MC}p = 0.039$). There were also significant relationships between the study participants' comorbidities (hypertension ($x^2 = 7.094$ $^{MC}p = 0.029$), anemia (x^2 8.471 ^{MC}p 0.014), heart diseases ($x^2 = 6.414$ $^{MC}p = 0.042$)), the use of vitamins ($x^2 = 11.120$ $^{MC}p = 0.002$), the sliding on the floor ($x^2 = 7.299$ $^{MC}p = 0.026$), the falls on stairs ($x^2 = 6.007$

^{MC}**p** = 0.049), and the night falling (x^2 =7.868 ^{MC}**p** = 0.020) and their balance.

Table (7) illustrates the relationship between socio-demographic characteristics, clinical data, fall history, and the Short Falls Efficacy Scale-International (SFES-I) in community-dwelling seniors with cataract. Back to the table, there were no statistically significant relationships between the study seniors' sex (x^2 = 2.489 ^{MC}**p** = 0.262), age (x^2 = 3.949 ^{MC}**p** = 0.399), marital status (x^2 = 6.159 ^{MC}**p** = 0.386), educational level (x^2 = 9.219 ^{MC}**p** = 0.155), working condition (x^2 = 6.276 ^{MC}**p** = 0.388), monthly income (x^2 = 0.319 ^{MC}**p** = 0.903), and their concern about falling. The same table shows that there were no statistically significant relationships between current diagnosis (x^2 = 1.368 ^{MC}**p** = 0.511), comorbidities in relation to hypertension (x^2 = 4.208 ^{MC}**p** = 0.111), diabetes mellitus (x^2 = 0.142 ^{MC}**p** = 0.928), anemia (x^2 = 2.958 ^{MC}**p** = 0.240), heart diseases (x^2 = 2.371 ^{MC}**p** = 0.326), respiratory diseases (x^2 1.281 ^{MC}**p** 0.651), osteoporosis (x^2 = 3.830 ^{MC}**p** = 0.145), and osteoarthritis (x^2 = 2.571 ^{MC}**p** = 0.265), the use of antihypertensive medications (x^2 = 2.462 ^{MC}**p** = 0.284), eye drops (x^2 = 2.257 ^{MC}**p** = 0.330), hypoglycemic drugs (x^2 = 0.641 ^{MC}**p** = 0.754), vitamins (x^2 = 4.453 ^{MC}**p** = 0.110), cardiac medications (x^2 = 1.482 ^{MC}**p** = 0.468), analgesics (x^2 = 2.044 ^{MC}**p** = 0.340), and respiratory drugs (x^2 = 0.375 ^{MC}**p** = 0.918), the presence of physical disabilities (x^2 = 1.831 ^{MC}**p** = 0.578), the use of assistive devices (x^2 = 3.324 ^{MC}**p** = 0.189) and their concern about falls. The table also represents the relationship between the study seniors' falls history and their concern about falls and the differences were not statistically significant (number of falls last year (x^2 = 0.856 ^{MC}**p** = 0.750), the main cause of falls such as, visual problems (x^2 = 3.621 ^{MC}**p** = 0.164), balance problems (x^2 = 1.186 ^{MC}**p** = 0.638), sliding on the floor (x^2 = 0.502 ^{MC}**p** = 0.778), dizziness or vertigo (x^2 = 2.432 ^{MC}**p** = 0.315) the location of falls such as, bathroom (x^2 = 0.561 ^{MC}**p** = 0.755), stairs (x^2 = 2.950 ^{MC}**p** = 0.177), and bedroom (x^2 = 1.240 ^{MC}**p** = 0.538), the time of falls for example at night (x^2 = 1.809 ^{MC}**p** = 0.405), in the morning (x^2 = 2.044 ^{MC}**p** = 0.414), and afternoon (x^2 = 0.334 ^{MC}**p** = 0.914), the trauma or injury caused by falls such as, wounds (x^2 = 0.991 ^{MC}**p** = 0.609), bruises (x^2 = 0.824 ^{MC}**p** = 0.662), bone fractures (x^2 = 4.26 ^{MC}**p** = 0.104), and dislocation of the joint (x^2 = 2.416 ^{MC}**p** = 0.273).

Table (1): Socio-demographic characteristics of community-dwelling seniors with cataract (n= 100)

Items	No.	%
Sex		
Female	53	53.0
Male	47	47.0
Age		
60-<75	69	69.0
75-<85	26	26.0
85-87	5	5.0
Mean ± SD	**71.82± 7.68**	
Marital status		
Married	52	52.0
Single	7	7.0
Widow	7	7.0
Divorced	34	34.0
Education		
Illiterate	42	42.0
Basic	28	28.0
Secondary	14	14.0
University and more	16	16.0
Working condition before retirement		
Not working	**44**	**44.0**
Working	**56**	**56.0**
Employee	23	41.1
Skilled works	17	30.3
Free works	16	28.6
Monthly income		
Not enough	53	53.0
Enough	47	47.0

Table (2): clinical data and fall history of community-dwelling seniors with cataract (n= 100)

Items	No.	%
Community-dwelling seniors ' clinical data		
Current diagnosis		
- Senile cataract	89	89.0
- Cataract with complications	11	11.0
Comorbidities #		
- Hypertension	77	77.0
- Diabetes mellitus	41	41.0
- Anemia	29	29.0
- Heart diseases	27	27.0
- Respiratory diseases	11	11.0
- Osteoporosis	7	7.0
- Osteoarthritis	6	6.0
Medications used #		
- Antihypertensive	77	77.0
- Eye drops	63	63.0
- hypoglycemic drugs	41	41.0
- Vitamins	40	40.0
- Cardiac medications	27	27.0
- Analgesics	24	24.0
- Respiratory drugs	11	11.0
Physical disabilities		
Yes#	**99**	**99.0**
- Visual problems	90	90.9
- Hearing problems	32	32.3
- Mobility problems	27	27.3
No	**1**	**1.0**
Assistive devices used		
Yes#	**95**	**95.0**
- Medical eye glasses	90	94.7
- Mobility aids	28	29.5
- Medical hearing aids	21	22.1
No	**5**	**5.0**
Community-dwelling seniors ' fall history		
Number of falls last year		
No	**54**	**54.0**
Yes	**46**	**46.0**
- Once	36	78.3
- Twice	10	21.7
Main causes of fall #		
- Visual problems	41	89.1
- Sliding on the floor	25	54.4
- Balance problems	8	17.4
- Dizziness or vertigo	6	13.1
Locations of fall #		
- Bathroom	29	63.1
- Stairs	19	41.3
- Bedroom	7	15.2
- Other	4	8.7
Times of fall #		
- At night	32	69.6
- In the morning	13	28.3
- Afternoon	10	21.7
trauma or injury caused by falls#		
- Wounds	28	60.9
- Bruises	20	43.5
- Bone fractures	14	30.4
- Dislocation of the joint	4	8.7

Multiple responses

Table (3): Levels of the Visual Function Index (VF-14), the Berg Balance Tests (BBT), and the Short Falls Efficacy Scale-International (SFES-I) in community-dwelling seniors with cataract (n= 100)

Items	No.	%
The Visual Function Index (VF-14)		
- Very sever visual impairments	0	0.0
- Sever visual impairments	25	25.0
- Moderate visual impairments	**61**	**61.0**
- Mild visual impairments	14	14.0
- minimal visual impairments	0	0.0
- No visual impairments	0	0.0
The Berg Balance Tests (BBT)		
- High risk to fall	12	12.0
- Moderate risk to fall	**49**	**49.0**
- Low risk to fall	39	39.0
The Short Falls Efficacy Scale-International (SFES-I)		
- High concern about falling	35	35
- Moderate concern about falling	**42**	**42**
- Low concern about falling	23	23

Table (4): Correlations between the Visual Function Index (VF-14), the Berg Balance Tests (BBT), and the Short Falls Efficacy Scale-International (SFES-I) in community-dwelling seniors with cataract (n= 100)

Items	The Visual Function Index (VF-14)		The Berg Balance Tests (BBT)		The Short Falls Efficacy Scale-International (SFES-I)	
	χ^2	^{MC}p	χ^2	^{MC}p	χ^2	^{MC}p
The Visual Function Index (VF-14)						
The Berg Balance Tests (BBT)	35.773[*]	<0.001[*]				
The Short Falls Efficacy Scale-International (SFES-I)	3.671	0.458	19.141[*]	0.001[*]		

χ^2: Chi square test   MC: Monte Carlo
[*]: Statistically significant at p ≤ 0.05

Table (5): the relationship between socio-demographic characteristics, clinical data & fall history and the Visual Function Index (VF-14) in community-dwelling seniors with cataract (n= 100)

Items	The Visual Function Index (VF-14)						Test of significance χ^2 $_{MC}p$
	Mild visual impairment (14)		Moderate visual impairment (61)		Severe visual impairment (25)		
	No.	%	No.	%	No.	%	
Community-dwelling seniors ' socio-demographic characteristics							
Sex							
Male	11	78.6	28	45.9	8	32.0	χ^2 7.780*
female	3	21.4	33	54.1	17	68.0	$_{MC}p$ 0.019*
Age							
60-<75	12	85.7	40	65.6	17	68.0	χ^2 1.909
75-<85	2	14.3	17	27.9	7	28.0	$_{MC}p$ 0.766
85-87	0	0.0	4	6.5	1	4.0	
Marital status							
Married	6	42.9	31	50.8	15	60.0	χ^2 4.471
Single	2	14.3	3	4.9	2	8.0	$_{MC}p$ 0.599
Widow	2	14.3	4	.66	1	4.0	
Divorced	4	28.5	23	37.7	7	28.0	
Educational level							
Illiterate	6	42.9	23	37.7	13	52.0	χ^2 2.955
Primary	3	21.4	20	32.8	5	20.0	$_{MC}p$ 0.830
Secondary	3	21.4	8	13.1	3	12.0	
University and more	2	14.3	10	16.4	4	16.0	
Working condition							
Not working	**3**	**21.4**	**26**	**42,6**	**15**	**60.0**	χ^2 9.642
Employee	3	27.3	15	42.9	5	50.0	$_{MC}p$ 0.122
Skilled works	6	54.5	8	22.9	3	30.0	
Free works	2	18.2	12	34.3	2	20.0	
Monthly income							
Not enough	5	35.7	32	52.5	16	64.0	χ^2 2.840
Enough	9	64.3	29	47.5	9	36.0	$_{MC}p$ 0.229
Community-dwelling seniors ' clinical data							
Current diagnosis							χ^2 12.007*
- Senile cataract	14	100.0	58	95.1	17	68.0	$_{MC}p$ 0.001*
- Cataract with complications	0	0.0	3	4.9	8	32.0	
Comorbidities #							
- Hypertension	11	78.6	46	75.4	20	80.0	χ^2 0.229 $_{MC}p$ 0.939
- Diabetes mellitus	6	42.9	22	36.1	13	52.0	χ^2 0.378 $_{MC}p$ 1.926
- Anemia	4	28.6	15	24.6	10	40.0	χ^2 2.091 $_{MC}p$ 0.340
- Heart diseases	4	28.6	14	23.0	9	36.0	χ^2 1.667 $_{MC}p$ 0.417
- Respiratory diseases	1	7.1	7	11.5	3	12.0	χ^2 0.230 $_{MC}p$ 1.000
- Osteoporosis	1	7.1	4	6.6	2	8.0	χ^2 0.401 $_{MC}p$ 1.000
- Osteoarthritis	1	7.1	3	4.9	2	8.0	χ^2 0.841 $_{MC}p$ 0.709
Medications used #							
- Antihypertensive	10	71.4	47	77.0	20	80.0	χ^2 0.489 $_{MC}p$ 0.881
- Eye drops	10	71.4	39	63.9	14	56.0	χ^2 0.962 $_{MC}p$ 0.656
- hypoglycemic drugs	4	28.6	23	37.7	14	56.0	χ^2 3.376 $_{MC}p$ 0.202
- Vitamins	4	28.6	24	39.3	12	48.0	χ^2 1.403 $_{MC}p$ 0.465
- Cardiac medications	4	28.6	15	24.6	8	32.0	χ^2 0.655 $_{MC}p$ 0.763
- Analgesics	1	7.1	13	21.3	10	40.0	χ^2 5.527 $_{MC}p$ 0.067
- Respiratory drugs	2	14.3	4	6.6	5	20.0	χ^2 3.664 $_{MC}p$ 0.164
Physical disabilities#							
No	**0**	**0.0**	**1**	**1.6**	**0**	**0.0**	χ^2 **1.180** $_{MC}p$ **1.000**
Yes#	**14**	**100.0**	**60**	**98.4**	**25**	**100.0**	
- Mobility problems	2	14.3	17	28.3	8	32.0	χ^2 1.392 $_{MC}p$ 0.523
- Visual problems	11	78.6	56	93.3	23	92.0	χ^2 2.342 $_{MC}p$ 0.301
- Hearing problems	4	28.6	15	25.0	13	52.0	χ^2 6.210* $_{MC}p$ 0.045*
Assistive devices used							
No	**0**	**0.0**	**5**	**8.2**	**0**	**0.0**	χ^2 **2.131** $_{MC}p$ **0.315**
Yes#	**14**	**100.0**	**56**	**91.8**	**25**	**100.0**	
- Mobility aid	1	7.1	18	32.1	9	36.0	χ^2 3.833 $_{MC}p$ 0143
- Medical eye glasses	12	85.7	53	94.6	25	100.0	χ^2 4.113 $_{MC}p$ 0.112
- Medical hearing aid	2	14.3	8	14.3	11	44.0	χ^2 11.105* $_{MC}p$ 0.004*

Table (5): the relationship between socio-demographic characteristics, clinical data & fall history and The Visual Function Index (VF-14) in community-dwelling seniors with cataract "continue" (n= 100)

Items	The Visual Function Index (VF-14)						Test of significance χ^2 ^{MC}p
	Mild visual impairment (14)		Moderate visual impairment (61)		Severe visual impairment (25)		
	No.	%	No.	%	No.	%	
Community-dwelling seniors ' fall history							
Number of falls last year							
No	**8**	**57.1**	**33**	**54.1**	**13**	**52.0**	
Yes	**6**	**42.9**	**28**	**45.9**	**12**	**48.0**	χ^2 2.372 ^{MC}p 0.681
- Once	6	100.0	22	78.6	8	66.7	
- Twice	0	0.0	6	21.4	4	33.3	
Main causes of fall #							
- Visual problems	5	83.3	25	89.3	11	91.7	χ^2 0.255 ^{MC}p 0.880
- Balance problems	1	16.7	3	10.7	4	33.3	χ^2 2.927 ^{MC}p 0.221
- Sliding on the floor	2	33.3	14	50.0	9	75.0	χ^2 2.428 ^{MC}p 0.341
- Dizziness or vertigo	1	16.7	3	10.7	2	16.7	χ^2 0.842 ^{MC}p 0.714
Locations of fall #							
- Bathroom	3	50.0	18	64.3	8	66.7	χ^2 0.507 ^{MC}p 0.776
- Stairs	2	33.3	11	39.3	6	50.0	χ^2 0.851 ^{MC}p 0.674
- Bedroom	1	16.7	4	14.3	2	16.7	χ^2 0.401 ^{MC}p 1.000
- Other	1	16.7	2	7.1	1	8.3	χ^2 1.104 ^{MC}p 0.766
Times of fall #							
- At night	3	50.0	21	75.0	8	66.7	χ^2 0.884 ^{MC}p 0.643
- In the morning	1	16.7	8	28.6	4	33.3	χ^2 0.545 ^{MC}p 0.836
- Afternoon	1	16.7	3	10.7	6	50.0	χ^2 6.321* ^{MC}p 0.026*
Trauma or injury caused by falls#							
- Wounds	3	50.0	18	64.3	7	58.3	χ^2 0.391 ^{MC}p 0.832
- Bruises	4	66.7	11	39.3	5	41.7	χ^2 0.790 ^{MC}p 0.674
- Bone fractures	2	33.3	7	25	5	41.7	χ^2 1. 279 ^{MC}p 0541
- Dislocation of the joint	0	0.0	2	7.1	2	16.7	χ^2 1.279 ^{MC}p 0.603

χ^2: Chi square test   MC: Monte Carlo

Table (6): the relationship between socio-demographic characteristics, clinical data & fall history and the Berg Balance Test (BBT) in community-dwelling seniors with cataract (n= 100)

Items	The Berg Balance Test (BBT))						Test of significance χ^2 ^{MC}p
	Low risk of fall (39)		Moderate risk of fall (49)		High risk of fall (12)		
	No.	%	No.	%	No.	%	
Community-dwelling seniors ' socio-demographic characteristics							
Sex							
Male	24	61.5	17	34.7	6	50.0	χ^2 6.322*
female	15	38.5	32	65.3	6	50.0	^{MC}p 0.039*
Age							
60-<75	28	71.8	34	69.4	7	58.3	χ^2 5.360
75-<85	11	28.2	12	24.5	3	25.0	^{MC}p 0.217
85-87	0	0.0	3	6.1	2	16.7	
Marital status							
Married	2	5.1	2	4.1	3	25.0	χ^2 10.003
Single	22	56.4	28	57.1	2	16.7	^{MC}p 0.091
Widow	12	30.8	16	32.7	6	50.0	
Divorced	3	7.7	3	6.1	1	8.3	
Educational level							
Illiterate	15	38.5	22	44.9	5	41.7	χ^2 4.702
Primary	9	23.1	16	32.7	3	25.0	^{MC}p 0.596
Secondary	7	17.9	4	8.2	3	25.0	
University and more	8	20.5	7	14.3	1	8.3	
Working condition							
Not working	**12**	**30.8**	**27**	55.1	**5**	**41.7**	χ^2 8.969
Employee	11	40.7	10	45.5	2	28.6	^{MC}p 0.153
Skilled works	8	29.6	8	36.4	1	14.3	
Free works	8	29.6	4	18.2	4	57.1	
Monthly income							
Not enough	20	51.3	22	44.9	5	41.7	χ^2 0.544
Enough	19	48.7	27	55.1	7	58.3	^{MC}p 0.803
Community-dwelling seniors ' clinical data							
Current diagnosis							χ^2 5.145 ^{MC}p 0.075
- Senile cataract	38	97.4	41	83.7	10	83.3	
- Cataract with complications	1	2.6	8	16.3	2	16.7	
Comorbidities #							
- Hypertension	31	79.5	40	81.6	6	50.0	χ^2 7.094* ^{MC}p 0.029*
- Diabetes mellitus	13	33.3	22	44.9	6	50.0	χ^2 1.703 ^{MC}p 0.416
- Anemia	10	25.6	11	22.4	8	66.7	χ^2 8.471* ^{MC}p 0.014*
- Heart diseases	10	25.6	10	20.4	7	58.3	χ^2 6.414* ^{MC}p 0.042*
- Respiratory diseases	3	7.7	5	10.2	3	25.0	χ^2 2.755 ^{MC}p 0.228
- Osteoporosis	3	7.7	2	4.1	2	16.7	χ^2 2.586 ^{MC}p 0.269
- Osteoarthritis	2	5.1	2	4.1	2	16.7	χ^2 2.703 ^{MC}p 0.256
Medications used #							
- Antihypertensive	27	69.2	42	85.7	8	66.7	χ^2 4.366 ^{MC}p 0.122
- Eye drops	24	61.5	32	65.3	7	58.3	χ^2 0.351 ^{MC}p 0.870
- hypoglycemic drugs	12	30.8	22	44.9	7	58.3	χ^2 3.473 ^{MC}p 0.185
- Vitamins	9	23.1	22	44.9	9	75.0	χ^2 11.120* ^{MC}p 0.002*
- Cardiac medications	11	28.2	10	20.4	6	50.0	χ^2 4.167 ^{MC}p 0.119
- Analgesics	5	12.8	15	30.6	4	33.3	χ^2 4.652 ^{MC}p 0.120
- Respiratory drugs	5	12.8	6	12.2	0	0.0	χ^2 1.272 ^{MC}p 0.544
Physical disabilities#							
No	**1**	**2.6**	**0**	**0.0**	**0**	**0.0**	χ^2 **2.003** ^{MC}**p 0.508**
Yes#	**38**	**97.4**	**49**	**100.0**	**12**	**100.0**	
- Mobility problems	7	18.4	14	28.6	6	50.0	χ^2 4.903 ^{MC}p 0.086
- Visual problems	33	86.8	45	91.8	12	100.0	χ^2 2.146 ^{MC}p 0.286
- Hearing problems	10	26.3	16	32.7	6	50.0	χ^2 2.521 ^{MC}p 0.283
Assistive devices used							χ^2 0.931 ^{MC}p 0.676
No	**2**	**5.1**	**2**	**4.1**	**1**	**8.3**	
Yes#	**37**	**94.9**	**47**	**95.9**	**11**	**91.7**	χ^2 5.001 ^{MC}p 0.082
- Mobility aid	7	18.9	15	31.9	6	54.5	χ^2 4.463 ^{MC}p 0.078
- Medical eye glasses	32	86.5	47	100.0	11	100.0	χ^2 3.513 ^{MC}p 0.173
- Medical hearing aid	7	18.9	9	19.1	5	45.5	

Table (6): the relationship between socio-demographic characteristics, clinical data & fall history and the Berg Balance Test (BBT) in community-dwelling seniors with cataract "continue" (n= 100)

Items	The Berg Balance Test (BBT))						Test of significance χ^2 ^{MC}p
	Low risk of fall (39)		Moderate risk of fall (49)		High risk of fall (12)		
	No.	%	No.	%	No.	%	
Community-dwelling seniors ' fall history							
Number of falls last year							
No	**26**	**66.7**	**24**	**54.1**	**4**	**52.0**	
Yes	**13**	**33.3**	**25**	**45.9**	**8**	**48.0**	χ^2 7.900 ^{MC}p 0.080
- Once	12	92.3	19	76.0	5	62.5	
- Twice	1	7.7	6	24.0	3	37.5	
Main causes of fall #							
- Visual problems	11	84.6	23	92.0	7	87.5	χ^2 4.844 ^{MC}p 0.089
- Balance problems	2	15.4	3	12.0	3	37.5	χ^2 4.360 ^{MC}p 0.094
- Sliding on the floor	6	46.2	18	72.0	1	12.5	χ^2 7.299* ^{MC}p 0.026*
- Dizziness or vertigo	2	15.4	3	12.0	1	12.5	χ^2 0.609 ^{MC}p 0.859
Locations of fall #							
- Bathroom	9	69.2	17	68.0	3	37.5	χ^2 1.529 ^{MC}p 0.465
- Stairs	4	30.8	10	40.0	5	12.5	χ^2 6.007* ^{MC}p 0.049*
- Bedroom	1	7.7	5	20.0	1	62.5	χ^2 2.127 ^{MC}p 0.327
- Other	2	15.4	1	4.0	1	12.5	χ^2 1.803 ^{MC}p 0.345
Times of fall #							
- At night	7	53.8	18	72.0	7	87.5	χ^2 7.868* ^{MC}p 0.020*
- In the morning	3	23.1	9	36.0	1	12.5	χ^2 2.690 ^{MC}p 0.261
- Afternoon	3	23.1	4	16.0	3	37.5	χ^2 3.114 ^{MC}p 0.212
Trauma or injury caused by falls#							
- Wounds	7	53.5	18	72.0	3	37.5	χ^2 3.862 ^{MC}p 0.145
- Bruises	8	61.5	9	36.0	3	37.5	χ^2 0.276 ^{MC}p 0.871
- Bone fractures	5	38.5	5	20.0	4	50.0	χ^2 4.357 ^{MC}p 0.113
- Dislocation of the joint	0	0.0	3	12.0	1	12.5	χ^2 3.160 ^{MC}p 0.227

χ^2: Chi square test   MC: Monte Carlo

Table (7) the relationship between socio-demographic characteristics, clinical data & fall history and the Short Falls Efficacy Scale-International (SFES-I) in community-dwelling seniors with cataract (n= 100)

Items	The Short Falls Efficacy Scale-International (SFES-I)						Test of significance χ^2 ^{MC}p
	Low concern (23)		Moderate concern (42)		High concern (35)		
	No.	%	No.	%	No.	%	
Community-dwelling seniors ' socio-demographic characteristics							
Sex							
Male	14	60.9	17	40.5	16	45.7	χ^2 2.489
female	9	39.1	25	59.5	19	54.3	^{MC}p 0.262
Age							
60-<75	16	69.6	29	69.0	24	68.6	χ^2 3.949
75-<85	4	17.4	12	28.6	10	28.6	^{MC}p 0.399
85-87	3	13.0	1	2.4	1	2.9	
Marital status							
Married	11	47.8	25	59.5	16	45.7	χ^2 6.159
Single	3	13.0	1	2.4	3	8.6	^{MC}p 0.386
Widow	2	8.7	4	9.5	1	2.9	
Divorced	7	30.4	12	28.6	15	42.9	
Educational level							
Illiterate	8	34.8	16	38.1	18	51.4	χ^2 9.219
Primary	9	39.1	9	21.4	10	28.6	^{MC}p 0.155
Secondary	5	21.7	6	14.3	3	8.6	
University and more	1	4.3	11	26.2	4	11.4	
Working condition							
Not working	**7**	**30.4**	**21**	**50**	**16**	**45.7**	χ^2 6.276
Employee	5	31.2	12	57.1	6	31.6	^{MC}p 0.388
Skilled works	6	37.5	4	19.1	7	36.8	
Free works	5	31.5	5	23.8	6	31.6	
Monthly income							
Not enough	10	43.5	21	50.0	16	45.7	χ^2 0.319
Enough	13	56.5	21	50.0	19	54.3	^{MC}p 0.903
Community-dwelling seniors ' clinical data							
Current diagnosis							χ^2 1.368
- Senile cataract	22	95.7	36	85.7	31	88.6	^{MC}p 0.511
- Cataract with complications	1	4.3	6	14.3	4	11.4	
Comorbidities #							
- Hypertension	14	60.9	35	83.3	28	80.0	χ^2 4.208 ^{MC} 0.111
- Diabetes mellitus	9	39.1	18	42.9	14	40.0	χ^2 0.142 ^{MC} 0.928
- Anemia	10	43.5	10	23.8	9	25.7	χ^2 2.958 ^{MC} 0.240
- Heart diseases	9	39.1	9	21.4	9	25.7	χ^2 2.371 ^{MC} 0336
- Respiratory diseases	3	13.0	3	7.1	5	14.3	χ^2 1.281 ^{MC} 0.651
- Osteoporosis	1	4.3	1	2.4	5	14.3	χ^2 3.830 ^{MC} 0.145
- Osteoarthritis	1	4.3	1	2.4	4	11.4	χ^2 2.571 ^{MC} 0.265
Medications used #							
- Antihypertensive	15	65.2	33	78.6	29	82.9	χ^2 2.462 ^{MC}p 0.284
- Eye drops	13	56.5	30	71.4	20	57.1	χ^2 2.257 ^{MC}p 0.330
- hypoglycemic drugs	11	47.8	16	38.1	14	40.0	χ^2 0.641 ^{MC}p 0.754
- Vitamins	13	56.5	17	40.5	10	28.6	χ^2 4.453 ^{MC}p 0.110
- Cardiac medications	8	34.8	9	21.4	10	28.6	χ^2 1.482 ^{MC}p 0.468
- Analgesics	8	34.8	8	19.0	8	22.9	χ^2 2.044 ^{MC}p 0.340
- Respiratory drugs	3	13.0	4	9.5	4	11.4	χ^2 0.375 ^{MC}p 0.918
Physical disabilities#							
No	**0**	**0.0**	**0**	**0.0**	**1**	**2.9**	χ^2 **1.831** ^{MC}**p 0.578**
Yes#	**23**	**100.0**	**42**	**100.0**	**34**	**97.1**	
- Mobility problems	7	30.4	10	23.8	10	29.4	χ^2 0.398 ^{MC}p 0.819
- Visual problems	22	95.7	39	92.9	29	85.3	χ^2 2.714 ^{MC}p 0.300
- Hearing problems	7	30.4	15	35.7	9	26.5	χ^2 0.897 ^{MC}p 0.639
Assistive devices used							
No	**3**	**13.1**	**1**	**2.4**	**1**	**2.9**	χ^2 **3.324** ^{MC}**p 0.189**
Yes#	**20**	**87.0**	**41**	**97.6**	**34**	**97.1**	
- Mobility aid	7	35.0	12	29.3	9	26.5	χ^2 0.165 ^{MC}p 0.921
- Medical eye glasses	20	100.0	38	92.7	30	88.2	χ^2 0.582 ^{MC}p 0.795
- Medical hearing aid	3	15.0	12	29.3	6	17.6	χ^2 2.643 ^{MC}p 0.267

Table (7): the relationship between socio-demographic characteristics & clinical data and the Short Falls Efficacy Scale-International (SFES-I) in community-dwelling seniors with cataract "continue" (n= 100)

Items	The Short Falls Efficacy Scale-International (SFES-I)						Test of significance χ^2 ^{MC}p
	Low concern (23)		Moderate concern (42)		High concern (35)		
	No.	%	No.	%	No.	%	
Community-dwelling seniors ' fall history							
Number of falls last year							
No	**9**	**39.1**	**24**	**57.1**	**21**	**60.0**	χ^2 2.722 ^{MC}p 0.256
Yes	**14**	**60.9**	**18**	**42.9**	**14**	**40.0**	
- Once	12	85.7	13	72.2	11	78.6	χ^2 0.856 ^{MC}p 0.750
- Twice	2	14.3	5	27.8	3	21.4	
Main causes of fall #							
- Visual problems	13	92.9	17	94.4	11	78.6	χ^2 3.621 ^{MC}p 0.164
- Balance problems	3	21.4	3	16.7	2	14.3	χ^2 1.186 ^{MC}p 0.638
- Sliding on the floor	5	35.7	12	66.7	8	57.1	χ^2 0.502 ^{MC}p 0.778
- Dizziness or vertigo	3	21.4	1	5.6	2	14.3	χ^2 2.432 ^{MC}p 0.315
Locations of fall #							
- Bathroom	8	57.1	12	66.7	9	64.3	χ^2 0.561 ^{MC}p 0.755
- Stairs	3	21.4	1	5.6	3	21.4	χ^2 2.950 ^{MC}p 0.177
- Bedroom	3	21.4	10	55.6	6	42.9	χ^2 1.240 ^{MC}p 0.538
- Other	1	7.1	2	11.1	1	7.1	χ^2 0.486 ^{MC}p 1.000
Times of fall #							
- At night	10	71.4	12	66.7	10	71.4	χ^2 1.809 ^{MC}p 0.405
- In the morning	1	7.1	6	33.3	6	42.9	χ^2 2.044 ^{MC}p 0.414
- Afternoon	2	14.3	5	27.8	3	21.4	χ^2 0.334 ^{MC}p 0.914
Trauma or injury caused by falls#							
- Wounds	8	57.1	12	66.7	8	57.1	χ^2 0.991 ^{MC}p0.609
- Bruises	6	42.9	7	38.9	7	50.0	χ^2 0.824 ^{MC}p 0.662
- Bone fractures	6	42.9	3	16.7	5	35.7	χ^2 4.26 ^{MC}p0.104
- Dislocation of the joint	1	7.1	3	16.7	0	0.0	χ^2 2.416 ^{MC}p 0.273

χ^2: Chi square test   MC: Monte Carlo

Discussion

Cataract is an eye condition that can result in vision impairment and blindness in older adults and usually results in progressive vision loss with medical, societal, and economic consequences **(Mencucci et al., 2023)**. There are at least 2.2 billion visually impaired people in the world. Vision impairment may have been avoided in at least 1 billion of these cases **(WHO, 2023)**. Older adults with cataract may experience difficulties in balance and movement due to impaired depth perception resulting from vision impairment **(Aljied et al., 2018)**. Community-dwelling seniors with balance impairment are more at risk for fall and its

consequences. Fall represents a significant societal problem due to its psycho-social effects, such as fear of falling, depression, and anxiety among older adults **(Mihailovic et al., 2020)**. Therefore, this study was conducted to identify the relationship between visual functioning, balance, and fear of falling among community-dwelling seniors with cataract.

The present study results revealed that senile cataract is more prevalent among community dwelling seniors aged 60 to less than 75 years, with a mean of 71.82± 7.68 years **(Table 1&2)**. There was also a significant relationship between the study seniors' current diagnosis (senile cataract)

and their visual functioning (**Table 5**). This may be due to age-related changes in the eye, such as clouding of the normally clear and transparent lens. This result in harmony with a study conducted in Egypt by **Mohamed et al., (2018)**, which found that cataract is more common in older adults, with a mean age of 73.1± 9.0 years. Similar findings were reported from Brazil by **Macedo et al., (2012)**.

Cataract was more observed among females than in males (**Table 1**). This could be attributed to the fact that women have a longer life expectancy than men and cataract occur as a result of ageing. In addition, hormonal changes in females post menopause increase the risk of cataract. The same finding was reported in another study carried out in the UK by **Green (2022)**. In contrast, other studies done in Egypt and Turkey by (**Mohamed et al., 2018; Kıvanç, et al., 2016**) who reported that cataract is more common among males than females; this might reflect the gender distribution in the study population, as men may have a higher tendency to visit hospitals for medical care at this age, and women had significantly lower compliance with follow-up compared with men.

Moreover, the current research findings revealed that significant relations were found in both sex with their visual function and balance (**Table 5&6**). This may be due to ageing, and balance is regulated by the visual system and the loss or reduction of vision associated with cataract can affects mobility and balance as a result of the altered depth perception and can interfere with the equilibrium of community-dwelling seniors. These findings are in line with the findings of the study done in Canada by **Aljied et al., (2018)**.

Education is the cornerstone for preventing all health problems such as cataract; the current study results revealed that illiteracy is prevailing among community dwelling seniors with cataract (**Table 1**), but there was no a significant relationship between illiteracy and visual functioning, balance, and fear of fall (**Table 5, 6, 7**). In contradict with the current study finding, a study done in France by **Soler, et al., (2016)** demonstrated a significant relation between senior's illiteracy and visual impairment because a low level of education constitutes a risk factor for low quality of life and unhealthy lifestyle habits.

The hallmark results of the current research revealed that the majority of the study participants had visual problems at a moderate level and were wearing medical eye glasses (**Table 2&3**). The present study also illustrated that the community-dwelling seniors had moderate levels of fall risks, and fall concerns (**Table 3**). Fortunately, there were statistically significant positive correlations between the study participants visual functioning and their balance, and the balance with their fear of falling. The visual functioning of the study participants was not statistically correlated with their fear of falling (**Table 4**). The rationale for these findings may be referred to the clinical data of the studied community dwelling seniors, which revealed that the vision impairment associated with cataract can affect mobility and balance, increase their risk for fall with its consequences, and cause fall phobia among them. These were in congruence with a study done in the USA by **Swenor et al., (2020)** and a study done in India by **Singh et al., (2022)**.

Comorbidity of the studied participants considered as another explanation for these findings ; hypertension which is the most common disorder among the study subjects, followed by diabetes mellitus, anemia, and heart diseases (**Table 2**). This finding may be attributed to the fact that epidemiologic studies of such conditions are the main risk factors for cataract (**Nam et al., 2018; Gorski, et al., 2021**) This is in accordance with a study conducted in the New York by **Gorski, et al., (2021)**. A study done in Sweden by **Ekstrom & Hugosson (2020)** reported that cardiovascular diseases and their risk factors have little effect on the incidence of age-related cataract, which contradicts the results of the present study.

Furthermore, the present study also showed significant relations between hypertension, heart diseases, and anemia with balance among community dwelling seniors with cataract (**Table 6**). This may be related to these health problems are important leading causes for cataract occurrence which result in vision impairment and consequently can negatively affect mobility and balance. This result is consistent with the findings of a study conducted in Turkey by **Mylona et al., (2019)**.

Unfortunately, more than half of the study subjects fallen in the last year as a result of visual problems and sliding on the floor. The bathroom and

stairs were the most common locations for falls. More than two-thirds of the seniors fallen at night, and the main consequences of the falls were wounds and bruises **(Table 2)**. There were also significant relationships between the study participants' falls due to sliding on the floor, falls on stairs, and the night and afternoon falling with their balance **(Table 6)**. This may be related to decreased depth perception and night vision with ageing, and these problems affect the balance of seniors and make them at high risk for fall. Similar findings were reported from Canada by **Kaheil et al., (2021)**.

Finally, gerontological nurses play an important role in detecting early indications of cataract in community-dwelling seniors who are at a high risk of vision loss. This is to improve seniors' quality of life through early diagnosis and timely care of problems **(Mohamed et al., 2018; Mencucci et al., 2023)**.

Conclusion and recommendations

The visual functioning and balance were revealed to have statistically significant positive relationship among community-dwelling seniors with cataract; additionally, their balance was positively connected with their fear of falling. On the other hand, their visual functioning was not significantly correlated with their fear of falling. Personal factors, clinical data, and fall history of community-dwelling seniors with cataract have been identified as significant predictors of their visual impairments and risk of falling concerning sex, current diagnosis, comorbidity, medications used, physical disabilities, assistive devices used, the main causes of falls, locations of falls, and times of falls.

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

1. Ongoing assessment is essential for community-dwelling seniors with cataract to evaluate their level of visual functioning and balance; this will assist gerontological nurses in providing appropriate nursing interventions to lessen and prevent fear of falling and its adverse consequences.

2. Counseling programs must be designed by gerontological nurses to assist the community-dwelling seniors with cataract in following helpful measures such as the use of anti-glare sunglasses, magnifying lenses, and the positioning of lamps or reading lights to improve their functional and social activities, and thus their quality of life.

3. Continuing in-service training programs should be planed and provided to nursing staff in ophthalmology outpatient clinics. These programs should include knowledge and skills required for self-care management of community-dwelling seniors with cataract.

Future directions for research and practice:

1. Studying the effectiveness of nursing educational program on visual functioning, balance issues, and fear of falling in community-dwelling seniors with cataract.

2. Applying innovative technology to help community-dwelling seniors with visual impairments and balance issues. These technologies are interactive video games to improve balance and lower the chance of falling. Furthermore, smart canes are being used to assist vision-challenged seniors.

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