

Vision Related Quality of Life and Fear of Falls among Elderly Patients with Macular Degeneration



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ABSTRACT

Background: Age-related macular degeneration (AMD) is one of the most chronic eye problems that occur with age and affects the macular region of the retina, causing progressive loss of central vision. Also, it is one of the most common ophthalmic diseases triggering falls and deterioration in average elderly patient's quality of life. **The study aim to:** Determine the vision-related quality of life and fear of falls among elderly patients with macular degeneration. **Study design:** A descriptive, correlational research design was utilized to carry out this study. **Study subjects:** A purposive sample of 77 elderly patients. **Setting:** The study was conducted at outpatient Clinics of Ophthalmic Center that affiliated to Mansoura University. **Tools of data collection:** Three tools were used, **Tool I:** Elderly Patient's Demographic Characteristics and Clinical Data Interview Schedule, **Tool II:** The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) and **Tool III:** The Modified Falls Efficacy Scale (MFES). **Results:** The overall score of VFQ -25 (mean \pm SD) was 35.73 ± 14.96 which indicate poor vision related quality of life. 63.60% of studied elderly patients were very concerned about falls and there was a strong significant negative correlation between vision related quality of life and fear of fall for all subscale ($p < 0.0001^{**}$). **Conclusion** The greater fear of falls, the worse vision related quality of life among the studied age related macular degeneration patients. **Recommendations:** Education programs to improve knowledge about fall prevention and improve quality of life among elderly patient will be beneficial to reduce their fear of falls.

Keyword: Age related macular degeneration, Elderly patients, Fear of falls, vision related quality of life

Introduction:

Worldwide, aging population has taken on a dominant trend; Both the overall population and the proportion of elderly people are rising in every country in the world., thus age-related disorders, such as age related macular degeneration (AMD), are becoming more significant in today's society. Age-related macular degeneration (AMD) is a complex, chronic, and progressive retinal disease that accounts for many of the causes of permanent vision loss in individuals over 60 worldwide (Chakravarthy et al., 2020, Merle et al., 2022, Rozing et al., 2020). It accounts for 9% of all incidents of blindness worldwide, placing it as the fourth most common cause of blindness globally. During 2020 it was estimated that the numbers of elderly patients who suffer from AMD were 196 million and it is expected that this number will reach to 288 million by 2040 (Chakravarthy et al., 2020, Fernandes et al., 2022).

There are various categories of AMD (Sadda et al., 2018). Early and middle stages which display symptoms like variable size , number of drusen, as well as the presence of pigmentary anomalies, and the late stage which exhibits symptoms of advanced diseases, such as neovascularization and geographic atrophy (GA). In other way, AMD can be classified into two other categories based on the presence or absence of neovascularization in dry (non-neovascular) AMD and wet moist AMD (neovascular) (de Guimaraes, Varela, Georgiou & Michaelides , 2022). The risk factors for the development of AMD can vary depending on these factors which include (phenotypic, demographic, environmental, genetic, and molecular risk factor).The age is considering a dominant risk factor for its development, which AMD prevalence being over 24% in adults 65 to 74 and over 44% in those 70 to 95 years (Brandl, et al ., 2018).

Central vision is necessary for carrying out daily tasks since it immediately influences a person's capacity to connect with the surroundings. Loss of central vision which occurs with AMD frequently results in impairment, dependency, disability and emotional, functional, and psychological distress, all of these lower the patient quality of life (QoL) (Marakis, Koutsandrea & Poulou, 2022, Roque, et al., 2021). "Vision-related quality of life" (VRQOL) is the phrase used to describe how satisfied an individual is with their visual abilities and how their vision impacts their daily lifestyle (Yibekal, Alemu, Anbesse, Alemayehu & Alimaw, 2020). Vision related quality of life is intended to measure how a person's quality of life including their capacity to carry out everyday tasks and their social and emotional well-being is impacted by a visual impairment. Elderly patients suffering from impaired vision due to AMD, experience a variety of problems that may affect health and general quality of life, like falls and fear of falling (Ahluwalia , Shen & Del Priore , 2021).

Falls are the main cause of the injury-related morbidity and mortality among elderly. The estimated incidence of falls rises along with the increase in elderly population. More than one-third of elderly falls each year, and 50% of these people re-experience falls again. Frequently this incidence occur twice as in elderly patients with AMD than in those with normal vision, and higher rates of falls are usually linked to vision loss (Smee, Berry, Anson & Waddington, 2017, White, Black, Delbaere & Wood, 2022). Evidence suggests that fear of falls increases with age particularly with those who have positive falls history (Brustio, Magistro, Zecca, Liubicich & Rabaglietti, 2018). Fear of falls is defined as holding onto worries about potential falls in the future, which typically develops after falls. It is a crucial and complex factor that has a variety of effects on older individuals particularly who's with visual impairment (Curcio, et al., 2020, Lee & Tak, 2021). They may exhibit rising levels of activity restriction and falls, all of which can raise their chance of contracting higher levels of fear of falls, which can cause impairment in physical mobility, depression, activity avoidance, low social interaction, and loss confidence all of these can affect elderly patients quality of life (Schoene et al., 2019, White, Black, Delbaere, & Wood, 2021).

For elderly patient who are visually impaired, gerontological nurses are crucial in addressing their unique needs. They should plan and deliver high-quality, evidence-based care by

assessing these conditions and being aware of the implications of visual impairment and its major influence on daily living activities (Hassmiller & Wakefield, 2022). Also, gerontological nurse can advocate the elderly patient to decrease fear of falls by decreasing incidence of fall itself through taking pre-fall, during-fall, and post-fall histories, Then review the medication taken and determine risk factors, which include extrinsic (like footwear and environment) and intrinsic (like poor vision, impaired balance and gait), followed by examination of potential fall-related consequences, such as fractures, head trauma, cuts to the skin, and a fear of falls, Then educating the elderly patients about the importance of being physically active using appropriate assistive devices, treating medical condition, wearing suitable shoes, removing home hazards and using appropriate light can be effective in decreasing incidence of falls and consequently fear of falls (Ott , 2018, Ouyang et al., 2022).

1.2 Aim of the study

This study aimed to determine the vision-related quality of life and fear of falls among elderly patients with macular degeneration

1.3 Research Questions:

1. What is the level of vision-related quality of life among elderly patients with macular degeneration?
2. What is the level of fear of falls among elderly patients with macular degeneration?
3. What is the relationship between vision-related quality of life and fear of falls among elderly patients with macular degeneration?

2. Subjects and Method

2.1 Research Design

Descriptive, correlational research design was utilized to conduct this study.

2.2 Study Setting

This study was carried out at Ophthalmic Center that affiliated to Mansoura University .The center provides comprehensive eye service with different subspecialties through different clinics and units including, a full eye checkups clinic, diabetic screening clinic, cataract, and intraocular lens implantation unit, glaucoma unit, medical retina unit, pediatric eye clinic, ophthalmic investigative unit, and outpatient clinics. These clinics work 6 days per week, where patients with visual impairment can attend to receive care according to their needs.

The study subjects were specifically selected from outpatient medical retina clinic and Optical coherence tomography (OCT) unit. These clinic work 5 days per week and receive approximately 30 patients per day with different retinal problems like retinopathy, retinal detachment, retinitis, macular edema, macular hole, retinal vein occlusion and macular degeneration. The clinic provides medical exams to diagnose these retinal issues and offers treatment accordingly. Additionally, it offers these patients with specific health education according to their needs.

2.3 Subjects:

A purposive sample of 77 elderly patients diagnosed with age related macular degeneration who attended the previously indicated setting were chosen in this study and met the following criteria:

Inclusion Criteria:

- Age sixty years or above
- Willing to participate voluntarily in the study
- Able to communicate
- Accessible at the period of data collection

Exclusion criteria:

Elderly patients with neurological or ophthalmological disease other than macular degeneration that could compromise visual acuity and peripheral vision

2.4 Sample size calculation:

Sample size for studying vision-related quality of life and fear of falls among elderly patients with macular degeneration was calculated based on the data from literature **White, Black, Delbaere & Wood, 2021**), considering a level of significance of 5%, and power of study of 80%, the sample size was calculated using the following formula: Sample size = $[(Z_{1-\alpha/2})^2 \cdot SD^2] / d^2$, where, $Z_{1-\alpha/2}$ at 5% type 1 error ($p < 0.05$) is 1.96, SD = standard deviation of variable and d = absolute error or precision. So, sample size = $[(1.96)^2 \cdot (24.6)^2] / (5.5)^2 = 76.9$. The formula above indicates that the sample size needed for the investigation is 77 elderly patients with macular degeneration.

2.5 Data collecting tools:

Three tools were utilized to gather pertinent data for the study:

Tool I: Elderly Patient's Demographic Characteristics and Clinical Data Interview Schedule:

This tool was developed by the researchers after reviewing the related literatures (**Caballe-Fontanet et al., 2022, Fernández-Vigo et al., 2021, Pondorfer, et al., 2019, Van Landingham, Massof, Chan, Friedman, & Ramulu, 2014**). It consists of 3 parts:

Part (1) The elderly patients' with macular degeneration demographic characteristics such as age, gender, marital status, level of education, occupation before retirement, income, and living condition.

Part (2): Elderly patients' with macular degeneration medical histories such as medical disease and medication used, family history, and previous history of falls, eating habits, smoking history, exposure to the sun, weight, height, body mass index, and sleeping problems.

Part (3): Disease-related characteristics including macular degeneration type, duration of illness, stage and which eye is affected.

Tool II: The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) to assess the vision-related quality of life

The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) is a comprehensive, vision-focused questionnaire utilized to evaluate visual impairment. NEI VFQ-25 evaluates a person's perception of their ocular problems by measuring the impact of ocular diseases on broader domains of health such as emotional health and general well-being. The National Eye Institute originally developed it in response to the need for a new tool to assess the level of visual impairment in people with a variety of chronic eye conditions, ranging in severity from moderate to severe. **Mangione et al., (1998)**. The 51-item initial questionnaire was later condensed into the 25-question NEI-VFQ-25 by eliminating items that demonstrated ground or ceiling effects or that were deemed unnecessary. The shorter version has been verified for practicality and demonstrated to have comparable psychometric qualities to the longer form (**Mangione, et al., 2001**). It was translated into Arabic by **Abdelfattah et al., (2014)** and tested for its validity and reliability by (Cronbach- α of the ARB-VFQ-25 ranged from 0.70 to 0.91).

Scoring system:

The NEI-VFQ-25 is a questionnaire designed specifically for measuring vision problems in age-related macular degeneration (Cahill, Banks, Stinnett, & Toth, 2005). It is composed of 12 subscales: general health (1 item), general vision (1 item), ocular pain (2 items), near activities (3 items), distance activities (3 items), vision-specific social functioning (2 items), vision-specific mental health (4 items), vision-specific role difficulties (2 items), vision-specific dependency (3 items), driving (3 items), color vision (1 item) and peripheral vision (1 item). This indicates that it incorporates physical, emotional and social elements of visual disability. As a result, it evaluates all proposed components of quality of life (QoL) Aaronson (1988).

Each subscale of the NEI-VFQ-25 was assigned a score between 0 and 100 based on the responses of the individuals, with lower scores indicating lower vision-related quality of life. The mean score across all subscales, with the exception of the "overall health" item, is regarded as the composite NEI-VFQ-25 score Mangione (2000).

Tool III: The Modified Falls Efficacy Scale (MFES).

This scale was developed by Tinetti et al., (1990) and modified by Buchner et al., (1993) to assess fear of falls. The scale was translated into Arabic by Sharaf and Ibrahim (2008) and was tested for its content validity and reliability ($r=0.70$). The scale evaluates the level of fear about the possibility of falling while performing ten daily tasks, such as getting dressed, cooking, cleaning, bathing or showering, moving upstairs and downstairs, opening doors and answering phones, shopping, bending over or lifting objects, and going outside. Each inquiry receives a score ranging from 1 (not at all concerned) to 4 (severely concerned).

Scoring system:

The overall score is ranging from 10 to 40 and split into four categories,

- A score from 1 to 10 mean not at all concerned.
- A score from 11 to 20 mean slightly concerned.
- A score from 21 to 30 mean moderately concerned.
- A score from 31 to 40 mean very concerned (Saleh, Ibrahim, Mohamed & El-Gilany, 2018).

Data collection process:

I:Phase of preparation: -included the following:-

- **Administrative stage:** A formal written letter was sent from faculty of nursing, Mansoura University, and then directed to the head of the Ophthalmic Center Mansoura University to get his approval and to allow the researcher to conduct the study.
- The head of the Ophthalmic Center Mansoura University was informed about the study purpose and the timing of the data collection.
- **Literature review:** that completed through reviewing academic works from around the world and nationally on various aspects including macular degeneration, vision related quality of life and fear of falls using different resources like textbooks, online searches, and scientific published articles. This review served as a framework for designing the study tools.

Developing the data collection study tools:-

- Tool I (Elderly Patient's Demographic characteristics and Clinical Data interview schedule) was developed by researcher after the literature review.
- The Arabic version of tool II (The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) and tool III (The Modified Falls Efficacy Scale MFES) were used by the researcher in this study.
- Content validity; A jury of five experts in the related field of gerontological nursing revised the study developed tools (tool I, tool II, tool III) to test the content validity and feasibility. Accordingly the necessary modifications were carried out.
- Face validity; was completed using a pilot study conducted on 10% of the study subject (8) elderly patients with macular degeneration to ascertain the clarity, feasibility, relevance, comprehensiveness, and applicability of the developed tools before conducting a large scale study to test plan and method of research study and to estimate the time needed to fill the questionnaire sheet, and it was excluded from the study sample and then no changes were made to.
- **The reliability;** Tool II (The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) has been assured by means of Cronbach Alpha test ($\alpha=0.91$). Tool III (The Modified Falls Efficacy Scale (MFES) The scale reliability was assured by means of r coefficient ($r=0.7$).

Ethical considerations:

Ethical approval has been obtained from the Faculty of Nursing Mansoura University research ethics committee. Before the study began, all subjects who were included gave written informed consent after receiving information about the purpose, nature, and advantages of the study. The study subjects' privacy was assured; the confidentiality of the data obtained was maintained and was used only for the study purpose. Each participant received assurances that their participation in the study is voluntary and that they can leave at any moment without incurring any fees or penalties.

Phase II: Operational phase: This phase began in July 2022 and ended in December 2022, taking a period of six months. and included the following:

- Beginning to gather data as soon as the required approval was received by the researcher
- The researcher used to visit the setting stated above for 4 hours / day, five days / week.
- The interview was conducted individually with each elderly patient who met the sample requirements and agreed to participate in the study, beginning with the researcher's self-introduction and explanation of the study's goal in order to gather the required data utilizing all the study tools.
- The interview schedule was taken 20 to 25 minutes to fill out.
- Demographic and health-relevant data was assessed using the tool I (Elderly Patient's Demographic Characteristics and Clinical Data Interview Schedule).
- The vision-related quality of life was assessed using tool II (The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) and fear of falls was assessed using tool III (The Modified Falls Efficacy Scale MFES).
- Weight: was measured using A Health genie Weight Machine for Body Weight (Thick & Tempered Glass, up to 180Kg: with an accuracy of 50 gram deviation). Set the weighing scale up by placing it on a flat, hard surface and pushing one foot down on the platform until random numbers appear. As soon as it reaches zero (0.0), remove the foot, and then begin to weigh. Request that the patient take off their shoes, outerwear (such as thick jackets).Then request that the patient to step on the scale evenly and completely while remaining motionless. Watch for stabilization

of the output screen. Read the value to the nearest (0.1kg).

- **Height:** Was measured utilizing measuring tab; brand BUSHIBU-150cm through the following steps : firstly the elderly was asked to remove shoes and socks to avoid impacting the measurement, then asked him to remove everything away from his/her head. Standing with the back to the wall by Place his/ her feet together. Heels, back, shoulders, and head should all touch the wall. The subject was asked to stand up as straight as he can and to look directly ahead while tucking the chin under. Body measurements (anthropometry) (CDC, 2023).
- **BMI (kg/m²)** was determined by dividing weight (kg) by height (m²) squared, and it was divided into four categories underweight less than 20 kg/m², normal from 20–25 kg/m², overweight from 25–30 kg/m² or obese equal to or greater than 30 kg/m² (Guo, et al ., 2021).

II. Data Analysis Phase

Version 22 of the statistical package for social science (SPSS) was used to analyze the data. The one-sample Kolmogorov-Smirnov test was used to test the normality of data. Number and percent were used to describe the qualitative data. Mean ± SD (standard deviation) were used to present continuous variable. The Student t test was used to compare the two groups. When comparing the means of more than two groups, the Analysis of Variance (ANOVA) test was utilized. Continuous data are correlated using Pearson correlation. The independent variables of vision-related quality of life and fear of falls were identified using a multivariate linear regression analysis model. In order to visualize data, graphs were created using Microsoft Excel..

Level significance:

The significance threshold (p-value) for all of the statistical tests listed above is set at the 5% level

The results were considered:

- Non-significant if the probability of error is more than 5% (P > 0.05).
- Significant if the probability of error is less than 5% (P < 0.05).
- Highly significant when the probability of error is less than 0.1% (P < 0.001).

The smaller the p-value obtained, the more significant are the results.

4. Results

Table one, shows that the mean age of the studied elderly patients was 67.26 ± 7.27 years. Males were more than females (70.1%, 53.2%) respectively. More than half of the studied elderly patients were married (53.2%) and had basic education (55.8%).

Table two, illustrates that 63.6% of studied elderly patients were suffering from hypertension, followed by diabetes mellitus (49.4%). Regarding medication taken it was founded that 63.6% of studied elderly patients were treated with anti-hypertensive medication followed by 49.4% treated with hypoglycemic agent. Also this table illustrate 70.1% and, 55.8% of them were admitted to the hospital, and done eye surgery during the last year respectively. 37.6% of them perform optical follow up with frequency of one month to less than six months.

Table 3: shows that 59.7% of studied elderly patients had positive family history of AMD, Regarding AMD type, Wet AMD was prevailing among the studied elderly patients and constituted 57.1%. Also the table illustrates that 67.5% of the studied elderly patients suffer from advanced form of AMD (neo-vascular), while only 32.5% suffer from early AMD. Concerning duration of AMD, 80.5% of studied elderly patient had the AMD since more than one year. Regarding affected eye, it was noticed that 63.4% of studied elderly patients their right eye were affected while 35% of them their both eyes were affected. Only 6.5% of studied elderly patients were exposed to artificial lighting.

Table 4: shows that ocular pain was represented the highest mean \pm SD which indicate better vision related quality of life, While mental health of studied elderly patients were represented the lowest mean \pm SD (26.98 ± 19.03) which indicate poor vision related quality of life and the overall composite score (mean \pm SD) was 35.73 ± 14.96 which indicate poor vision related quality of life.

Table 5 displays that highly statistical significant relation were found between age and

both vision related quality of life and fear of fall as elderly aged 65 to less than 85 had low VRQL and higher mean score of fear of falls than others ($P < 0.0001^*$), also the table revealed that the marital status affects significantly total mean score of VRQOL ($P < 0.0001^*$). In relation to living arrangements it was noticed from the table that significant relation was found between living arrangements and both mean score of VRQOL and mean score of fear of fall as elderly patient who live with their family had higher VRQOL mean score than those who live alone and lower mean score of fear of falls than those who live alone ($P = 0.009^{**}$; $P = 0.014^*$ respectively)

Table 6 Represents that there was highly significantly relation between the VRQOL and mean score of fear of fall and with type of AMD ($P < 0.0001^{**}$), as elderly patients with both forms of AMD had lower mean score of VRQOL (25.98 ± 7.32) and higher mean score of fear of falls than elderly patient with only dry form of AMD (37.43 ± 0.79). Moreover stages of AMD highly significantly relate with both total mean score of VRQOL and total mean score of fear of falls ($P < 0.0001^{**}$), as elderly patient with early stages of AMD had better quality of life and lower fear of falls level than those with advanced (neo-vascular). Regarding history of fall it was founded that there was highly statistical significance relation between history of fall and VRQOL ($P = 0.001^{**}$), Elderly patient with AMD who had negative history of fall had higher mean score of VRQOL than those with positive history. On the other hand it was founded that there was a highly statistically significance relation between fall history and mean score of fear of falls ($P < 0.0001^{**}$), Elderly patient who had positive history of fall had higher mean score of fear of falls (33.45 ± 6.28) than those with negative history.

Table 7: shows strong significant negative correlation between vision related quality of life and fear of fall for all subscale ($p < 0.0001^{**}$). Which indicate that studied elderly patients who had poor vision related quality of life had higher level of fear of falls and vice versa.

Table 1: Distribution of the studied elderly patients based on their demographic characteristics

Demographic Characteristics	N= 77	100%
Age (years)		
60 to less than 75 years	55	71.4
75 to less than 85 years	22	28.6
Mean ± SD (Min – Max)	67.26±7.27 (60-84yrs)	
Sex		
Male	54	70.1
Female	23	29.9
Marital status		
Married	41	53.2
Widow	36	46.8
Educational level		
Illiterate	30	39.0
Basic education	43	55.8
High education	4	5.2
Occupation before retirement		
Employee	15	19.5
Farmer	23	29.9
House wife	17	22
Craft worker	22	28.6
Current work		
Yes	3	3.9
No	74	96.1
Monthly income		
Enough	21	27.3
Not enough	56	72.7
Source of current income		
Pension	24	31.2
Relative	30	39.0
Social affairs	23	29.8
Residence		
rural	57	74.0
Urban	20	26.0
Living arrangements		
Alone	9	11.7
With the family	68	88.3

Table 2: Distribution of studied elderly patients according to their medical history

Medical History	N (77)	100%
Presence of chronic disease		
Yes	55	71.4
No	22	28.6
Type of chronic diseases#		
Hypertension	49	63.6
Diabetes mellitus	38	49.4
Cardiovascular disease	27	35.1

Osteoarthritis	26	33.8
Renal disease	10	13.0
Osteoporosis	6	7.8
Gout	3	3.9
Lumber disk	3	3.9
Rheumatic disease	1	1.3
Medication intake		
Yes	72	93.5
No	5	6.5
Type of medication#		
Analgesic	30	42.8
Hypertensive medication	49	63.6
Hypoglycemic agents	38	49.4
Cardiovascular medication	27	35.1
Vitamins and minerals	21	27.3
Renal medication	10	13.0
Past year hospital admission		
No	23	29.9
Yes	54	70.1
Last year eye surgery		
No	34	44.2
Yes	43	55.8
Optics follow up		
No	36	46.8
From one month to less than six months	29	37.6
From 6 months to a year	12	15.6

More than one answer was given

Table 3: Distribution of studied elderly patients based on their history of age related macular degeneration

Items	N (77)	100%
Past medical family history of AMD		
No	31	40.3
Yes	46	59.7
Degree of kinship#		
First degree	40	51.9
Second degree	19	24.7
AMD type		
Dry	26	33.8

Wet	44	57.1
Dry and wet	7	9.1
Stage of AMD		
Early	25	32.5
Advanced(neovascular)	52	67.5
Duration of AMD		
Less than one year	15	19.5
More than one year	62	80.5
Affected eye		
Right eye	28	36.4
Left eye	22	28.6
Both	27	35
Exposure to artificial lightening		
No	72	93.5
Yes	5	6.5

More than one answer was given

AMD: Age- related Macular Degeneration

Figure 1 shows that 68.8% of the studied elderly patient with AMD had positive history of falls, while 31.20% had negative history of falls.

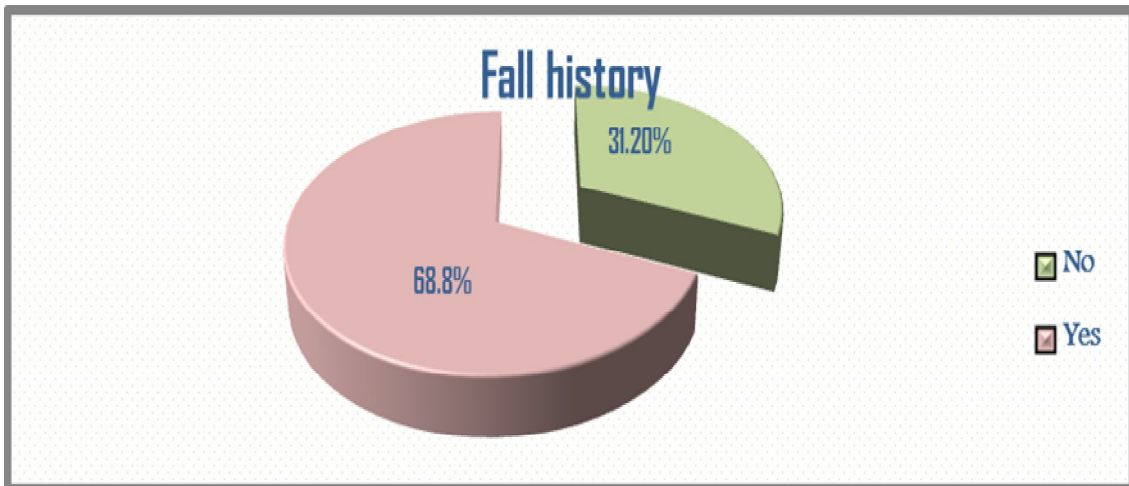


Figure (1): Distribution of studied elderly patients with AMD based on their history of falls

Table 4: Distribution of studied elderly patients according to their vision related quality of life

VFQ-25* subscale	Mean ± SD	Min	Max
General health	35.71±15.4	0	75
General vision	58.51±15.33	20	80
Ocular pain	46.59±20.24	12.50	87.50
Near activities	31.2±17.64	0	75.00
Distance activities	29.71±14.64	0	75.00
Social functioning	31.98±14.55	0	75.00
Mental health	26.98±19.03	0	62.50
Role difficulties	30.58±21.93	0	75.00
Dependency	34.72±24.76	0	75.00
Driving	33.97±8.64	25	75
Color vision	36.69±16.52	0	75
Peripheral vision	30.19±14.25	0	75
<i>Overall composite</i>	<i>35.73±14.96</i>		

Higher scores reflect better vision related quality of life (VRQOL)

* $n = 77$ for all subscales except driving ($n = 13$).

Figure 2 shows that 63.60% of studied elderly patients were very concerned about falls, 27.30% were moderately concerned and 9.10% were slightly concerned, The total mean ± SD score of fear of falls level was 31.58 ± 6.83

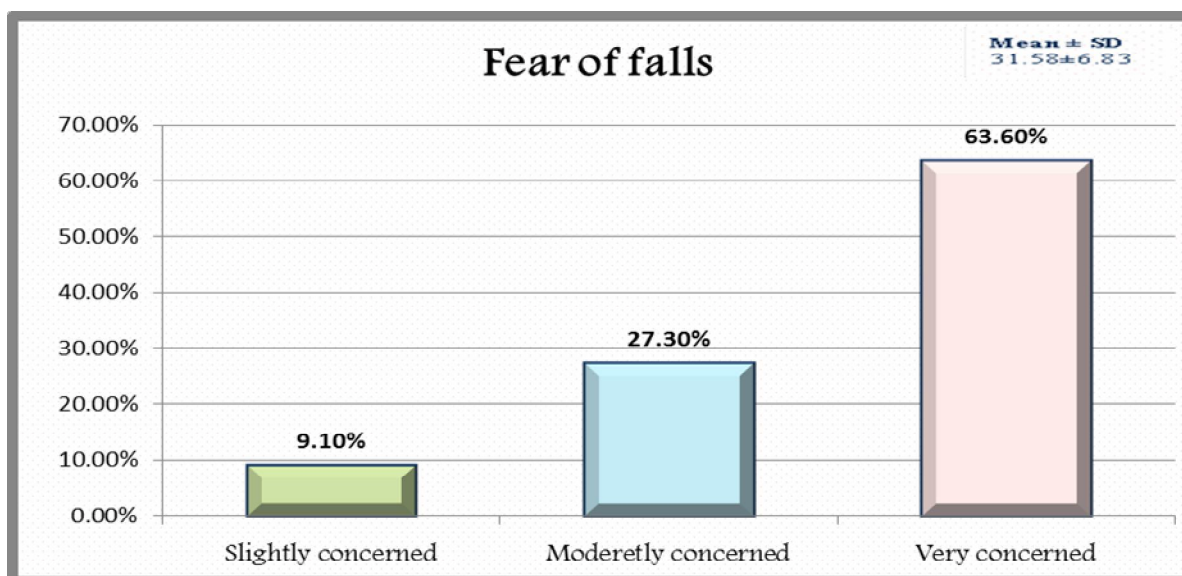


Figure (2): Distribution of studied elderly patients with AMD based on their fear of falls level

Table 5: Relation between demographic characteristics of the studied elderly patients, their vision related quality of life and total score of fear of falls

Demographic Characteristics	N= 77	VRQOL	Test of significance	Fear of falls	Test of
		Mean ± SD		Mean ± SD	
Age (years)					
60 to less than 75 years	55	40.04±13.93	T=4.462 P=<0.0001*	29.98±7.0	T=-3.487
65 to less than 85 years	22	24.97±11.87		35.59±4.37	P=0.001**
Sex					
Male	54	35.24±15.45	T=-0.437 P=0.663	32.09±6.41	T=1.000
Female	23	36.88±13.98		30.39±7.75	P=0.320
Marital status					
Married	41	41.14±15.77	T=3.647 P=<0.0001*	29.63±7.53	T=-2.791
Widow	36	29.58±11.33		33.81±5.19	P=0.007**
Educational level					
Illiterate	30	32.06±13.52	F=1.512 P=0.227	33.53±5.84	F=2.280
Basic education	43	38.18±15.16		30.53±7.04	P=0.109
High education	4	36.98±21.38		28.25±9.54	
Occupation before retirement					
Employee	15	41.9±12.17	F=1.157 P=0.332	28.07±6.7	F=1.897
Farmer	23	32.93±16.7		33.26±4.89	P=0.138
House wife	17	34.93±12.24		32.12±7.23	
Craft worker	22	35.08±16.35		31.82±7.86	
Current work					
Yes	3	67.58±11.55	T=4.144 P=<0.0001*	23.33±2.89	T=-2.187
No	74	34.44±13.63		31.92±6.74	P=0.032*
Monthly income					
Enough	21	44.53±16.58	T=3.370 P=0.001**	29.1±7.02	T=-1.997
Not enough	56	32.43±12.98		32.52±6.58	P=0.049
Residence					
Rural	57	34.72±12.44	T=-1.001 P=0.320	32.09±6.7	T=1.093
Urban	20	38.61±20.65		30.15±7.17	P=0.278
Living arrangements					
Alone	9	23.73±9.43	T=-2.662 P=0.009**	36.78±2.39	T=2.511
With the family	68	37.32±14.87		30.9±6.94	P=0.014*

Higher scores reflect better vision related quality of life (VRQOL)

Higher scores indicating greater fear of falling

*: Statistically significant at $p \leq 0.05$

** : Statistically highly significant at $p \leq 0.01$

Table 6: Relation between medical history of the studied elderly patients, their vision related quality of life and fear of falls

Items	N (77)	VRQOL	Test of significance	Fear of falls	Test of significance
		Mean ± SD		Mean ± SD	
Presence of chronic disease					
Yes	55	30.04±10.85	T=2.164 P=0.034*	30.35±7.13	T=-2.612
No	22	38.01±15.83		34.68±4.9	P=0.011*
Past year hospital admission					
No	23	48.29±15.44	T=5.730 P=<0.0001*	26.43±6.86	T=4.938
Yes	54	30.38±11.14		33.78±5.56	P=<0.0001**
Last year eye surgery					
No	34	46.92±13.91	T=7.802 P=<0.0001*	26.29±6.7	T=-8.332
Yes	43	26.89±8.45		35.77±2.93	P=<0.0001**
AMD type					

Dry	26	51.81±11.29	F=55.108 P=<0.0001**	23.38±4.22	F=111.554 P=<0.0001**
Wet	44	27.78±8.79		35.5±3.17	
Dry and wet	7	25.98±7.32		37.43±0.79	
Stage of AMD					
Early	25	51.32±11.23	T=9.175 P=<0.0001**	23.48±4.28	T=-12.799 P=<0.0001**
Advanced(neo-	52	28.24±9.88		35.48±3.63	
Duration of AMD					
Less than one year	15	43.59±19.17	T=2.334 P=0.022*	28.93±7.12	T=-1.696 P=0.094
More than one year	62	33.83±13.25		32.23±6.66	
Affected eye					
Right eye	28	36.06±13.54	F=0.066 P=0.936	31.00±6.69	F=0.216 P=0.806
Left eye	22	36.34±12.09		31.55±6.55	
Both	27	34.89±18.55		32.22±7.37	
Fall history					
No	24	44.12±16.91	T=3.561 P=0.001**	27.46±6.25	T=-3.884 P=<0.0001**
Yes	53	31.93±12.37		33.45±6.28	

Higher scores reflect better vision related quality of life (VRQOL)

*: Statistically significant at $p \leq 0.05$

** : Statistically highly significant at $p \leq 0.01$

Table 7: Correlation between total score of fear of falls and vision related quality of life subscales among the studied elderly patients

VFQ-25 subscale	N	MFES total score	
		r	p
General Health	77	-0.498	<0.0001**
General vision	77	-0.606	<0.0001**
Ocular pain	77	-0.630	<0.0001**
Near activities	77	-0.737	<0.0001**
Distance activities	77	-0.630	<0.0001**
Social functioning	77	-0.609	<0.0001**
Mental health	77	-0.808	<0.0001**
Role difficulties	77	-0.752	<0.0001**
Dependency	77	-0.835	<0.0001**
Driving	13	- 0.534	<0.0001**
Color vision	77	-0.534	<0.0001**
Peripheral vision	77	-0.498	<0.0001**

**Correlation is significant at the 0.01 level (2-tailed).

VFQ-25: Visual function questioner

MFES: Modified fear of fall efficacy scale

Discussion

Age-related macular degeneration (AMD) is a chronic degenerative irreversible retinal condition that causes loss of central vision, and eventually impairs all daily living activity. Patient with AMD encounter many challenges during the day particularly with essential daily living tasks, including taking care of themselves, driving, writing, cleaning, and shopping which make them feel reliant on others and have trouble establishing regular routines, they might also experience mental distress, sadness and fear of falls (Inan, Cetinkaya, Duman, Dogan & Inan, 2019, Man, et al., 2022).

Regarding demographic characteristics of studied elderly patients the current study revealed that about two third of the studied elderly patient's age ranged from 60 years to less than 85years with a mean age of 67.26 ± 7.27 years. This is may be justified by the effect of ageing processes on retinal macula creating a structural and blood flow abnormalities that predispose people to AMD, however advanced age does not always result in AMD (Thomas, Mirza & Gill, 2021). The current result was supported by a study conducted in Germany by Ponderfer et al., (2019). founded that the Participants' mean age was 73.9 ± 8.4 and another study conducted in Tokyo, Japan by Sasaki et al., (2018) stating that the mean age was 64.5 ± 7.1 . In addition another study conducted in Spain by Sanabria et al, (2023) , who reported that the mean age was 81.2 ± 7.1 years.

In relation to occupational work before retirement this result revealed that about one third of the studied elderly were farmers as the majority of them were living in the rural area where the farming is the popular profession. This result is justified by the prolonged exposure to the sun light during work which participate to macular and retinal damage as it was founded that the sun light exposure consider one of the AMD risk factor Oddone et al., (2019). This result was in the same line with the study performed in Italy by Oddone et al., (2019), who conducted a case study on patient didn't has any risk factor of AMD except agriculture work for more than 25 years and eventually he develop the AMD problem without exposure to any other occupational risk factor, concluded that occupational exposure to the sun light during agriculture work participate to the development of AMD. Regarding living arrangement the majority of the studied elderly patients were living with their family this was justified by the presence of culture believes in our

society that the family provides us with a sense of security as well as the sense that we are unable to take care of ourselves when become older, So the family is the place that takes care of their basic needs and protects them. This result supported with the study performed in Palencia, Spain by Sanabria et al., (2023), who stated that the majority of his studied subjects were living with their family and friends.

The result of the present study founded that about two third of studied elderly patients were suffering from chronic diseases, including hypertension followed by diabetes mellitus then cardiovascular disease respectively this may justified by nature of aging which predispose to several cellular and molecular processes malfunction that eventually results in a variety of chronic illnesses and disorders Li et al., (2021). In the line with the current results of the study, a study done in Portugal by Farinha et al., (2019), in korea by Jung et al., (2023) , in China by Luo, et al .,(2023), and in South Korea by Shim, Kim, Bae, Yu, & Song, (2016), Founded that the high percentage of older adult with AMD suffer from hypertension ,diabetes and cardiovascular disease, consequently the majority of them receive medication to treat these conditions. The present study revealed that more than half of the studied elderly patients had positive family history of AMD this result is in an agreement with the study done in Saudi Arabia by Abusharkh, et al., (2023), in United States by Seddon, De & Rosner , (2023), and in Europe by Bucan et al., (2022), stating the same results

Regarding AMD type, the present study revealed that more than half of studied elderly patient were diagnosed with wet AMD, while only one third were diagnosed with dry AMD this may be justified by that the studied elderly patient weren't seek medical help unless in advanced cases this may be related to their low educational level, lack of knowledge, living in rural area, and low income. This result was supported by the study done in Germany by Abdin et al., (2023), who stating the same results. In contrary to this results a study done in Saudi Arabia by Abusharkh et al .,(2023) and in Spain by Zapata et al., (2021), stated that most patients in their study had dry AMD, followed by wet AMD and dry AMD is more prevalent than wet AMD this may related to the different demographic characteristics of the studied subjects.

Concerning vision related quality of life the result of the present study revealed that the elderly patients with AMD report low score in the majority of all NEI-VFQ-25 subscale test including (general health, general vision, near and distant activities social functioning, mental health, role functioning, driving, color vision and peripheral vision) especially subscale of the mental health that recording the lowest mean indicating poor vision relating quality of life except the ocular pain subscale which recording the highest mean this justified by visual impairment restricts all aspects of everyday life and eventually affects quality of life. This result was consistence with the study to assess quality of life (QoL) among AMD done in turkey by **Inan, Cetinkaya, Duman, Dogan & Inan (2019)**, who stating that the AMD patients had lower QoL scores. In addition to another study conducted in Germany **Künzel et al., (2020)**, in Japan by **Gomi et al., (2019)**, in Greek by **Marakis, Koutsandrea, & Poulou, (2022)**, in United States of America by **Roh, Selivanova, Shin, Miller, & Jackson, (2018)**, founded the same results.

Fear of falls is a significant psychological component commonly linked to falls among the elderly, particularly with visual impairment. Age related macular degeneration one of the main causes of vision loss among elderly, which has been linked to falls (**White, Black, Delbaere & Wood, 2021**). The result of the present study revealed that about two third of the studied elderly patient were very concerned with fear of falls and this is simply justified by their visual impairment caused by AMD disease and also related to their positive history of falls. This result is supported by the study done in Australia by **White, Black, Delbaere, & Wood, (2021)**, who conducted a study to investigate prevalence and level of fear of falls among elderly patients with age-related macular degeneration (AMD) stating that fear of falls scores were higher among AMD participants. In addition to a study performed in Brazil by **Urata, Mazzoli, & Kasahara, (2018)**, in Chicago by **Van Landingham, Massof, Chan, Friedman & Ramulu, (2014)**, founded the same results.

Among elderly, visual impairment is very common and frequently associated with an increased risk of falls that in most common associated with fear of falls .Fear of falls is an equally serious health issue as fall itself, it results in activity avoidance and reduced social interaction eventually decrease quality of life (**Cakir, Mandiracioglu, Hassoy & Horasan, 2023, Singh & Maurya, (2022)**). The result of the present study

shows that VRQOL scores were significantly lower among specific groups. Significantly, low mean VRQOL scores were noted among those who were older, widow, didn't have a current work ($P<0.05^*$) and highly significant low mean were noted among those who were didn't have monthly income and who were living alone ($P<0.01^*$).This result was justified by the majority of the elderly patients believing that vision loss is inevitable with ageing and believing that nothing can be done to change the situation, in addition to age-related ocular illnesses causing deterioration in visual function that have a major impact on patients' VRQOL, concerning the widow it was justified that the widow people may experience psychological distress, anxiety, and depression in addition to the lose the partner who may help each other to accomplish daily tasks and eventually may experience poor quality of life . Also it was justified that patient who didn't have current work consequently have low monthly income and this may affect their ability to seek medical and affect their nutritional health eventually leading to poor VRQOL, This result was consistent with the study done in Nigeria by **Ezeh, Etim, Edet, Ezeh, & Duke, (2019)**,who conducted a study to determine the influence of demographic characteristics on vision-related quality of life in visually impaired patients and in china by **Bian et al .,(2020)** , who conducted a prospective longitudinal study to determine predictors of health-related quality of life in Chinese patients receiving treatment for neovascular age-related macular degeneration

Elderly fear of falls has negatively impact on their daily routines and social participation. It is significantly impacted by demographic factors like age, gender, and educational level (**Jamaati, Bakhshi & Haghgoo, 2021**). The result of the present study founded that advancing age was highly significantly associated to fear of falls among the studied elderly population ($P<0.01^{**}$). This finding can be explained by the fact that ageing is accompanied by a number of degenerative changes, such as immobility and diminished functional ability, physical frailty, and cardiac changes neuromuscular homeostatic systems and visual deterioration, which may either put older persons at risk for falls or give them a fear of falls. This result was supported by the study done in Palestine by **Badrasawi et al., (2022)**, in Vietnam by **Hoang, Jullamate, Piphatvanitcha & Rosenberg, (2017)**, and in Egypt by **Saleh, Ibrahim, Mohamed, & El-Gilany, (2018)**, which stated that increase age is linked to increase risk of fear of falls.

Also the result of the present study founded that the studied elderly patient who are widow reported high level of fear of falls compared to married with a highly statistical significant association ($P < 0.01^{**}$), this can be justified by death of one spouse mean lack of social support and sudden life style disruption create mental and physical deterioration thus elderly patient may ignore their own health and wellbeing and this problem exacerbating when there is visual problem. This result was parallel to the result of the study done in Singapore by **De Roza et al., (2022)** who reported that being widow can increase risk of fear of falls. Also current work and living arrangements are demographic characteristics that statistically significant associated with fear of falls among the studied elderly patients. This result was supported by the study done in in Palestine by **Badrasawi et al., (2022)**, which stated that there was a significant relation was found between fear of falls, employment, and living status.

In relation to medical history and VRQOL the result of the present study shows that VRQOL scores were significantly lower among specific groups. Significantly, low mean VRQOL scores (which represent poor VRQOL) were noted among those who had chronic disease , who had past year hospital admission ,who having eye surgery last year and who suffering from AMD more than one year ago ($P < 0.05^*$) and highly significant low mean (which reflect more deterioration in VRQOL) were noted among those who have delayed optic follow up from six months to a year ,elderly patient who have two forms of AMD (dry and wet),who have advanced form of AMD , and who had positive history of falls ($P < 0.01^{**}$) Concerning follow-up it may justified by the effect of follow up for early prediction of any problem and detection of any deterioration in addition to evaluation of effectiveness of treatment particularly for wet AMD patient who receive Anti VGEF therapy (**Lu et al .,2021**). This result was in the same line with the study conducted in Australia by **Vu et al., (2023)**, in china by **Bian et al .,(2020)** , and in Turkey by Inan, Cetinkaya, Duman, Dogan& Inan ,(2019) founded the same results

The result of the present study founded that presence of chronic disease was significantly associated to fear of falls among the studied elderly population ($P = 0.011^*$) this may justified by the effect of chronic disease that lead to morbidity which may result in persistent pain, intolerance to exercise, or physical inactivity ultimately leading to falls and consequently fear of falls. The result of the present study shows that fear of falls scores

were highly statistically significance among specific groups. Significantly, high mean FOF scores (which represent greater fear of falls) were noted among those who had past year hospital admission. This may be due to advanced age and associated balance issues as well as visual impairment in addition to hospital risk factor like anxiety and side effect of medication like hypotension **Najafpour, Godarzi, Arab, Yaseri , (2019)** ..

Also the result of the present study show that the advanced stage (neovasclar) of AMD is highly statistically significant associated to fear of falls among the studied elderly population ($P < 0.0001^{**}$), this may justified by that the advanced stages of AMD mean more deterioration in central vision affecting visual acuity which ultimately increase risk of falls and consequently fear of falls. This result was in the line with the study conducted in Australia by **White, Black, Delbaere& Wood, (2021)**. Who stated that high fear of falls scores were noted among patients diagnosed with Advanced AMD. As well as high mean fear of falls scores (which represent greater fear of falls) were noted among those who were obese this may justified by the obesity can causes loss of balance and postural stability participating to fall incidence (**Ercan, Baskurt, Baskurt & Cetin, 2020**) and this will become more horrible if we combined visual impairment factor . Also the result of the present study show positive history of falls was highly statistically significant associated to fear of falls among the studied elderly population ($P < 0.0001^{**}$), this may justified by the previous experience of fall that may participate psychologically to fear of its recurrence again as the elderly person may develop lack of self-esteem and lack of confidence in his/her ambulatory status. This result was supported by the study conducted in India by **Marmamula et al., (2020)**, founded the same results.

The result of the present study founded a strong significant negative correlation between vision related quality of life and fear of fall for all subscale ($p < 0.0001^{**}$) indicating that the patient who reported high score of fear of falls recording low score for their vision related quality of life vice versa, this was justified by the fear of falls may create tension, anxiety, worries to perform activity leading to restriction in mobility physical capacity and social restriction. This result was consistent with the previous study done in Vietnam by **Nguyen et al, (2020)** that was conducted to determine correlation between fear of fall and heath related quality of life but he used (EQ-5D-

5L) instrument to determine health related quality of life, stated that the fear of fall influence significantly HRQOL, depending on the FOF group scored 0.15 points lower in the EQ-5D index than the non-FOF group. Also this result is supported by a study conducted in Switzerland by **Van der Vet et al., (2021)** who conducted a study to investigate the effects of fear of falls on patient's quality of Life (QoL) stating that the (QoL) of patients appears to be adversely affected by fear of falls. Also this result was consistent with another study conducted in United States by **Lee, Hsu, Andrew, Davis & Johnson, (2022)**, to investigate the inter-relationship between vision impairment and FOF concluded that the visual impairment and associated fear of fall affect mobility and eventually quality of life. In the line with this results other studies conducted in Nigeria by **Akosile et al., (2021)**, a study conducted in Taiwan by **Wu et al., (2023)**, in Brazil by **Prata & Scheicher (2017)**, all of them were held to determine the effect of fear of falls on quality of life and all of them stating the same results.

Conclusion

A strong significant negative correlation between visions related quality of life and fear of falls was founded as the greater fear of falls, the worse quality of life among elderly patient with age related macular degeneration

6. Recommendations

- Education programs to improve knowledge about fall prevention in elderly patients with AMD will be beneficial for reducing their fear of falls.
- Develop an educational program to improve vision related quality of life among elderly patient with AMD.
- Develop an educational program about healthy life style for age related macular degeneration patients to halt disease progression.
- Improve AMD patient's awareness regarding the importance of regular optics follows up.

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The researchers reported that they had no conflict of interests.

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