

## Spectrum of Eye Diseases Attending Outpatient of Tanta Ophthalmology Hospital: An Observational Ecological Study

Marwa M. Marey<sup>1\*</sup>, Mona N. Mansour<sup>2</sup>, Afaf H. Rashwan<sup>2</sup>

<sup>1</sup>Department of Ophthalmology, Tanta Ophthalmology Hospital, Tanta, Egypt

<sup>2</sup>Department of Ophthalmology, Al-Azhar University, Cairo, Egypt

\*Corresponding author: Marwa M. Marey, Tel: +002 01068178126, E-mail: Marwamarey72@yahoo.com

### ABSTRACT

**Background:** The Vision 2020 initiative was ambitious and was essential in catapulting the issue of avoidable blindness in the spotlight and putting it on the global health agenda. The causes of avoidable blindness remain and have not been eliminated. **Objective:** This study aimed to determine and classify the ocular diseases between patients visiting Outpatient Clinics of Tanta Ophthalmology Hospital. According to this prevalence, our main goals were concentrated on health education, uptake of services, accessibility and acceptability. **Subjects and methods:** This ecological study was carried on 650 participants between December 2023 and June 2024. All patients in our study were subjected to full history taking by special designed questionnaire for demographic data and underwent comprehensive ophthalmic examinations.

**Results:** The ages of participants ranged widely, from 1 month to 85 years, 54.9% were females. Of the total participants, 76.0% were living in rural areas, 80% were educated, out-door occupation formed 32.9%. OSD is the most common eye disorder (55.69%), errors of refraction (22.46%), cataract (10.46%), DR (4.00%), glaucoma (3.85%), others (3.54%). Significant associations found between diagnosis and occupation in different groups, between diagnosis and diabetes mellitus as an associated systemic disease and between diagnosis and education.

**Conclusion:** The study highlighted common eye disorders in the Delta region of Egypt in a Tertiary Hospital, which is one of oldest Ophthalmic Hospital that belong to Ministry of Health. Conjunctival diseases, refractive errors and cataract were the most common diseases among these disorders, which signify burden of preventable and treatable eye diseases. The associations between diagnosis and occupation needs enhanced patient education to reduce the incidence of vision impairment.

**Keywords:** Eye diseases, Prevalence, Ophthalmology, Egypt, Ophthalmology hospital, Visual impairment, Public health.

### INTRODUCTION

The prevalence of eye diseases and visual problems vary across different populations and communities, most of ocular conditions that can cause blindness are either potentially preventable or treatable<sup>(1)</sup>. Worldwide, 285 million people have visual impairment, of whom 39 are blind with unequal distribution of visual impairment across different regions according to WHO<sup>(2)</sup>. The requirements for eye care services depends on the diagnosis and the severity of the condition. However, the successful management relies on early diagnosis and treatment of morbidities to prevent vision loss or blindness<sup>(3)</sup>. WHO primary purposes are to familiarize the aims, objectives and strategies of Universal Eye Health Coverage including key information from VISION 2020, WHO world report on vision, the Lancet Commission on Global Eye Health and in Sight 2030 of the new International Agency for the Prevention of Blindness (IAPB) eye health sector strategy<sup>(4)</sup>.

### SUBJECTS AND METHODS

This ecological study was carried on 650 participants from the Outpatient clinic of Tanta Ophthalmology Hospital in the period from December 2023 to June 2024. And we were classified the participants into different six groups according to examination and clinical data finding.

- **Group 1** (Ocular Surface Disorders; OSD): divided into 3 subgroups
  - Group 1A (Lid Diseases include Blepharitis - Chalazion -Trichiasis-Xanthelasma).
  - Group 1B (Conjunctival Diseases include Dry eye -Allergic Conjunctivitis-Pterygium -Trachoma).
  - Group 1C (Corneal Diseases include F.B Trauma-Corneal ulcers).
- **Group 2** (Cataract)
- **Group 3** (Diabetic Retinopathy; DR)
- **Group 4** (Glaucoma)
- **Group 5** (Errors of Refractions)
- **Group 6** (Other diseases include, Anterior uveitis, Blunt Trauma, Headache not related to eye, Papilledema, Posterior uveitis, Squint, Trauma, Vernal keratoconjunctivitis).

#### All participants were subjected to:

1. Full history taking and special designed questionnaire for demographic data as (name, age, sex, occupation, residency & systemic disease) and ophthalmic history including ocular trauma and ocular disease as glaucoma or previous ocular surgery.
2. Main complaint (onset and duration).
3. History of any systemic diseases.
4. Ophthalmic examination including:

- Visual acuity (VA) and Best corrected visual acuity (BCVA) by using Autorefractometer and Landolts chart.
  - Slit lamp examination of anterior segment (cornea, anterior chamber, iris and lens).
  - Intraocular pressure (IOP) measurement using Goldmann Applanation Tonometer.
  - Fundoscopic examination. by using +90 D lens.
5. Other investigation:
- Fundus photography for some patients who have diabetic retinopathy.

**Ethical consideration:** The protocol of the study was approved by the Ethical Board of Al-Azhar University ((No. 2122) and is adhered to the tenets of the Declaration of Helsinki. At the beginning of the interview, informed oral consent was obtained from participants before enrolment in the study after explanation of the purpose of the study and before participation in the study.

#### Statistical design:

Data were statistically described in terms of mean  $\pm$  standard deviation ( $\pm$  SD), median and range, or

frequencies (number of cases) and percentages when appropriate. Comparison between the study groups was done using Chi-square ( $\chi^2$ ) test. Exact test was used instead when the expected frequency is less than 5. Two-sided p values  $\leq 0.05$  was considered statistically significant. IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) release 22 for Microsoft Windows was used for all statistical analyses.

#### RESULTS

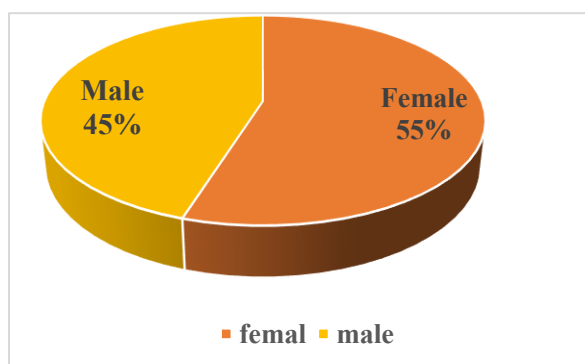
A total number of 650 participants were included in this study from the outpatient clinic of Tanta Ophthalmology Hospital. The ages of participants ranged widely, from 1 month to 85 years, females contributed to 54.9% of the total number of participants. We classified our patients according to diagnosis into 6 main groups. In this study we found that **ocular surface disorders** (G1) were the most common eye disorder, **conjunctival diseases** (G1B) were the most common disease among these group. **Refractive errors** (G5) were the 2nd common eye disorder. G2 and G3 were considerably older populations, while group G5 & G6 represents a relatively younger population as shown in table (1).

**Table (1):** Percentage of each group from total number of participants

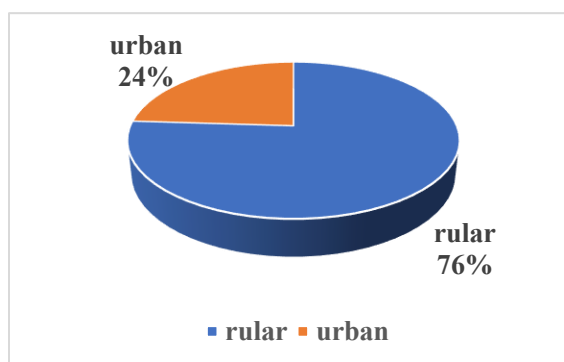
Groups	Count	% from total number of participants	Age (Mean $\pm$ SD)
Ocular surface disorders (G1)	362	55.69%	36.45 $\pm$ 20.32
Lid diseases (G1A)	118	18.15%	35.56 $\pm$ 21.87
Conjunctival diseases (G1B)	186	28.62%	36.09 $\pm$ 20.28
Corneal diseases (G1C)	58	8.92%	39.41 $\pm$ 16.96
Cataract (G2)	68	10.46%	59.97 $\pm$ 6.88
Diabetic retinopathy (G3)	26	4.00%	63.42 $\pm$ 7.59
Glaucoma (G4)	25	3.85%	55.88 $\pm$ 14.71
Refractive errors (G5)	146	22.46%	33.74 $\pm$ 16.01
Other disease (G6)	23	3.54%	33.96 $\pm$ 20.49
Total	650	100%	

Also, there was a slightly higher proportion of females (54.1%) than males (45.9%), as shown in figure (1).

Also, there was a notable rural dominance in most groups (76.0%) and urban represented 24.0% as shown in figure (2).

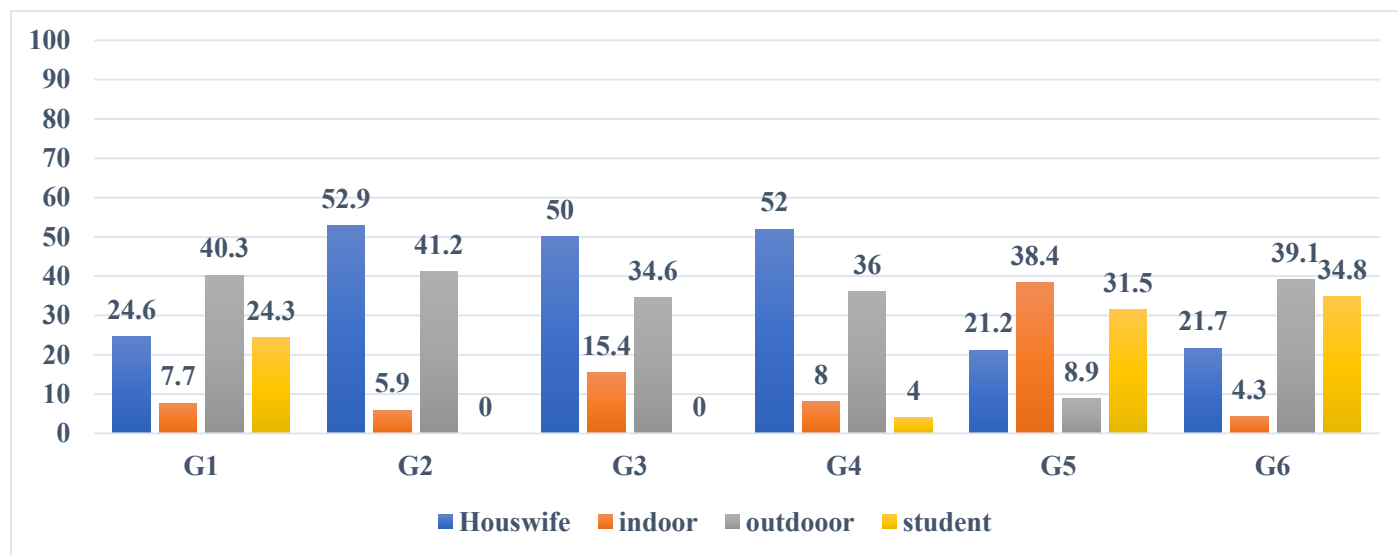


**Figure (1):** Gender distribution among the studied group.



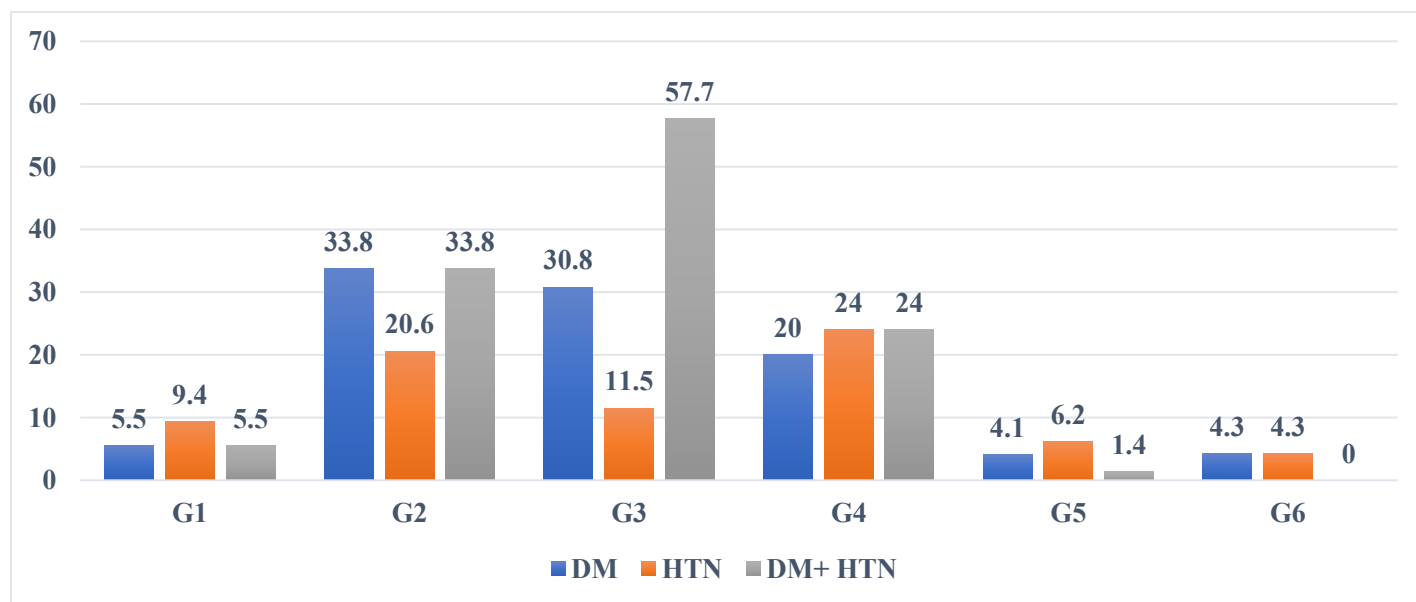
**Figure (2):** Residency distribution among the studied group.

Housewives constituted a significant portion in G2, G3, and G4 (above 50%), whereas outdoor workers were the largest group overall (32.9%), with a notable presence in G1, G2, G3, and G6. Indoor workers were most concentrated in G5 (38.4%), while students were well represented in G1 (24.3%), G5 (31.5%), and G6 (34.8%). Children were a very small fraction (1.7%), limited to G1 (figure 3).



**Figure 3:** Occupation Distribution between the Study Groups.

According to the association of systemic diseases between patients, G6 and G5 had the highest number of individuals with no systemic disease (91.3%, 88.4%). All patients in G3 had systemic diseases as shown in figure (4).



**Figure (4):** Distribution of study groups according to systemic diseases.

Associations between risk factors and diagnosis in each studied group are illustrated in table (2).

In G1A, a significant association was found between diagnosis and occupation, with p-values = 0.000.

Also, a significant association was found between diagnosis and DM as an associated systemic disease, with p-values = 0.002 (OD) & p-values = 0.043 (OS). In G1B, there was a significant association between diagnosis and occupation, with p-values = 0.000. In G1C, there was a significant association between diagnosis and education (p-values <0.05), a significant associations was found between diagnosis and occupation, with p-values = 0.004 (OD), between diagnosis and residency, with p-values = 0.002 (OD) and between diagnosis and DM as an associated systemic disease, with p-values = 0.007 (OD).

In G2, there was significant association between diagnosis and occupation, with p-values = 0.025 (OD). In G5, there was significant association between diagnosis and occupation (p = 0.002). In G6, there was a significant correlation between diagnosis and occupation [p = 0.001 (OS)], and between diagnosis and DM as an associated systemic disease with p-values < 0.05.

**Table (2):** Associations between risk factors and diagnosis in each studied group (Pearson Chi-Square test)

	<b>G1A</b>		<b>G1B</b>		<b>G1C</b>		<b>G2</b>		<b>G3</b>		<b>G4</b>		<b>G5</b>		<b>G6</b>	
	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>	<i>Value</i>	<i>p value</i>
<b>OD diagnosis * Occupation</b>	61.531	0.000	93.871	0.000	28.828.	0.004	7.384	0.025	.975	0.614	.855	0.836	21.025.	0.002	37.583	0.085
<b>OD diagnosis * Edu.</b>	.(a)		.(a)		51.629.	0.000	.(a)		.(a)		.(a)		2.062.	0.357	.(a)	
<b>OD diagnosis * Residence</b>	9.084	0.059	5.202	0.392	14.551	0.002	0.121	0.728	0.033	0.856	1.190	0.275	4.089	0.129	6.970	0.640
<b>OD diagnosis * DM</b>	16.578	0.002	7.549	0.183	12.249	0.007	0.313	0.576	3.630	0.057	0.649	0.420	4.598	0.100	23.000	0.006
<b>OS diagnosis * Occupation</b>	54.327	0.000	97.664	0.000	2.779.	0.947	0.953	0.621	0.975	0.614	0.855	0.836	21.025	0.002	45.636	0.001
<b>OS diagnosis * Edu.</b>	.(a)		.(a)		9.985	0.007	.(a)		.(a)		.(a)		2.062.	0.357	.(a)	
<b>OD diagnosis * Residence</b>	8.614	0.071	5.294	0.381	0.018	0.991	0.428	0.513	0.033	0.856	1.190	0.275	4.089.	0.129	4.298	0.745
<b>OS diagnosis * DM</b>	9.862	0.043	5.429	0.366	0.213	0.899	0.144	0.704	3.630	0.057	.649	0.420	4.598	0.100	23.000	0.002

**OD:** Right eye, **OS:** Left eye.

## DISCUSSION

In the present study, OSD (G1) was the most common eye disorder observed (55.6%). Conjunctival diseases were the most common disease among these disorders. Similarly, a study done in Beheira, Egypt revealed that conjunctival diseases were the most common eye disorders seen for all age groups (33.7%) and conjunctivitis representing 71% of this category. <sup>(5)</sup>

In our study, muco-purulent conjunctivitis was found in 34 patients (5.23% of our participants). This high prevalence may stem from the hospital serving large rural areas and a lack of awareness about proper eye hygiene. In agreement with us, **Okoye et al.** <sup>(6)</sup> found infectious eye diseases to be the most common, especially among children, in a rural south-eastern Nigerian community. Also, a study reported that conjunctivitis (Infective and allergic) were common eye disease in patients presented at the eye clinic in the Southwestern Nigeria. <sup>(7)</sup>

In our study, the prevalence of trachoma was 14.4% among participants in group 1 (G1). Globally, trachoma is recognized by the World Health Organization (WHO) as the leading infectious cause of blindness <sup>(8)</sup>. In Egypt, a study in the Nile Delta reported a 36.5% prevalence of active trachoma in children aged 2–6 years, with a higher incidence in rural areas compared to urban one <sup>(9)</sup>. Another study that was conducted by **Rashwan et al.** <sup>(10)</sup> in Upper Egypt, specifically in Shandawil village, Sohag Governorate, revealed a high prevalence of trachoma among students in three Azhar schools. In this study, 400 students were screened and treated according to the WHO's SAFE strategy. Trachoma primarily affects patients with restricted access to healthcare, this requires community-based interventions <sup>(11)</sup>.

Our study showed that chemical conjunctivitis constituted 7.5% within G1. Also, there was a significant correlation between it and occupation as outdoor worker such as chronic use of detergents and exposure to cement vapours more common in-house cleaners and construction builders. Same study carried in Ethiopia, where 182 out of all 384 study participants (47.5%), sought treatment of adnexal disorders (Lid, conjunctiva, lachrymal system), 24% of them came by allergic conjunctivitis <sup>(12)</sup>.

In our study dry eye was found in 10.5% within G1, males forming 57.89% of them, mainly of outdoor occupation. In the same context results of a study conducted in Singapore revealed that a higher exposure to NO<sub>2</sub> was associated with an increase in the frequency of irritative dry eye symptoms and increased frequency of meibomitis <sup>(13)</sup>. In a study conducted in Jordan by **Bakkar et al.** <sup>(14)</sup>, they found that dry eye was 59%. The prevalence of all dryness symptoms was higher in individuals over 45 years, contact lens users, and those frequently working with computers and ATM. This difference from our study

could be attributed to the patient's disregard for their eye symptoms & its connection to various climate conditions.

In this study lid diseases represent (18.1%) within G1 included chalazion (11.6%), trichiasis (6.6%), blepharitis (4.1%) and xanthelasma (2.2%). These results are in contrast to the findings of a study conducted in Beheira Eye Hospital, Egypt where lid and lacrimal system diseases represented 27.4% of cases and were the 2nd most common ocular disorder after conjunctival diseases (Excluding refractive errors in the study), chalazion and blepharitis were more common. <sup>(5)</sup>

In this study corneal foreign body was found in 40 eyes, 36 cases (5.54% of our participants), and all were related to occupational hazard, all were workers and not wearing protective goggles. 66.7% of them were living in urban areas. In a study conducted by **El-Mekawey et al.** <sup>(15)</sup>, they found that the most common reason for attending the eye clinic was corneal foreign body, managed as outpatient procedures.

Results of our study revealed that errors of refraction (22.4%) were the 2<sup>nd</sup> most common eye diseases. Similarly, results of a study carried out in Ilesa of Southwestern Nigeria reported that refractive error represented 19.5% <sup>(16)</sup>. However, a study conducted in Ghana found that uncorrected refractive errors were the fourth most common cause of ocular morbidity, with a prevalence of 8.90%. The lower prevalence in this study may be attributed to a lack of awareness, as some patients do not report poor vision to eye care providers due to negative perceptions about wearing spectacles and also the associated costs <sup>(17)</sup>. Several studies investigated the prevalence of visual impairment in Egypt. A study conducted in Cairo and included 960 school children found that the overall prevalence of refractive errors was 56.6% <sup>(18)</sup>. This is comparable with many studies conducted in various regions of Egypt, namely Menoufia, Tanta, Assiut, and South Sinai governorates to estimate the prevalence of refractive errors, which revealed higher frequencies of refractive errors between the observed school children in such areas (36.8, 17.5, 66.9, and 26.55% respectively) <sup>(19-22)</sup>.

In our study, we found that cataract was the third most common eye disease (10.4%) among our participants, of them 92.6% lived in rural areas. All of them aged > 45 years and 67.6% of them had DM. There was significant association between cataract diagnosis and outdoor occupation, with p-values = 0.025 (OD). In the same context, a study carried out in Southern Ethiopia included 734 adults aged > 40 years, the prevalence of cataract was 29.16%, factors associated with cataract formation were old age > 70 years (Adjusted odds ratio (AOR)=8.60), being diabetic (AOR=2.27), sunlight exposure (AOR=2.83) and ocular trauma (AOR=2.39) <sup>(23)</sup>. Also, in Saudi Arabia **Al Faran et al.** <sup>(24)</sup> reported that cataracts

were responsible for 52.6% of poor vision ( $VA < 3/60$ ) and 20.6% of visual impairment ( $VA < 6/12$ ) among 2882 people. On the contrary, a study that was carried out in a rural North-east China by **Song *et al.*** <sup>(25)</sup> included 5764 adult people, cataract was the most common cause for visual impairment (44%), followed by uncorrected refractive errors (24%).

Our study included diabetic patients, as DM among our studied groups was 11% in G1, 67.6% in G2, 88.5% in G3, 44% in G4 and 20.7% in G5 had. In our study, diabetic retinopathy (DR) represented 4% among our patients, of which 76.9% had PDR and 23.1% had NPDR. In contrary to a study carried out in Cairo, Egypt by **Rashwan *et al.*** <sup>(26)</sup> revealed that retinal diseases were the most common eye disorder seen in outpatient clinic (20.2%), and DR represented 19.2%. Additionally, a study included 690 diabetic patients in Saudi Arabia, 36.1% of them were found to have DR, and proliferative disease found in 6.4%. This relatively high prevalence rate might be due to the large number of late diabetic cases recorded in the study with differences in study methodology and population sampling <sup>(27)</sup>.

The prevalence of glaucoma globally is 3.54% for population aged 40-80 years. The highest prevalence of POAG is in Africa (4.20%), and the highest prevalence of PACG is in Asia (1.09%) <sup>(28)</sup>. The rates of blindness caused by glaucoma remains significant, ranging from 13.5% to 26.5% over a span of 10 years <sup>(29)</sup>. In this study glaucoma represented 3.85% among participants. A study in Farabi Eye Hospital, Iran, revealed that glaucoma represent 8.6% <sup>(30)</sup>. Another study carried out in Nigeria by **Ejiro *et al.***, who revealed that Glaucoma was the 5<sup>th</sup> most detected eye disease with a total of 230 (11.5% of 1033 participants) <sup>(31)</sup>. Similar to us, **Ehrlich *et al.*** <sup>(32)</sup> in US found that 2.56% of people 40 years or older have glaucoma, and black individuals are disproportionately affected <sup>(32)</sup>.

## CONCLUSION

The study highlighted common eye disorders in the Delta region of Egypt in Tanta Ophthalmology Hospital. Conjunctival diseases, refractive errors and cataract were the most common diseases among these disorders, which signify burden of preventable and treatable eye diseases. The associations between diagnosis and occupation needs enhanced patient education to reduce the incidence of vision impairment. There is a need for public health initiatives focusing on early diagnosis and improvement of healthcare access.

- **Conflicts of interest:** There are no conflicts of interest.
- **Funding statement:** This research received no external funding.

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