Managing Outpatient Consultations in Ophthalmology: Analyzing First Consultations Outcomes

Gestão das Primeiras Consultas em Oftalmologia: Análise dos Resultados

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ABSTRACT

INTRODUCTION: First consultations in ophthalmology, referred by general practitioners (GPs), significantly strain services. There is limited information on the main diagnoses and primary outcomes of these initial consultations in Portugal. This study aimed to describe the referral patterns and first consultation outcomes in the Ophthalmology service of Unidade Local de Saúde de Entre o Douro e Vouga.

METHODS: Two physicians reviewed GP referrals and first consultations over the first five months of 2023. Data on demographics, justification for referral, and consultations records were analyzed. Reasons for consultation were categorized and diagnoses were stratified according to the ICD-10 categories. Consultations were then classified by outcomes and specified accordingly.

RESULTS: Among 4917 referral-consultation pairs analyzed, 207 were excluded due to incomplete data. Chronic visual acuity loss (65.2%), diabetic retinopathy screening (11.6%), and ocular discomfort (4.9%) were the most common consultation reasons. In 11.6% of referrals, there was a prior ophthalmology evaluation. Approximately 58.8% (n=2892) resulted in discharge, 22.2% led to surgery, 11.1% were referred to a subspecialty, and 4.2% required follow-up. Of those discharged, 50.3% received a new refraction, 32.6% had no specific intervention, and others received lubrication, medical treatment, or surveillance instructions. Cataract surgery was the most frequent procedure (69.4%), and subspecialty referrals were primarily for glaucoma (21.5%) and medical retina (20.4%). There was a notable rate of incomplete data (3.2%) and duplicate consultations (0.7%) among referrals.

CONCLUSION: This study provides novel insight into the patterns of the first ophthalmology consultations in Portugal. Most referrals involve low-severity cases which can be managed conservatively. The presence of follow-up losses and duplicate consultations highlight potential areas affecting patient care. Reflecting on the role of GP in the referral process is essential, considering the burden of consultations in primary care that are mainly aimed at hospital referral. New triage strategies are needed to reduce unnecessary referrals, ensuring that only patients requiring specialized ophthalmologic care are referred. This would reduce the workload on GPs, create a more efficient system, and enhance patient access to specialized care.

KEYWORDS: Ophthalmology; Portugal; Primary Health Care; Referral and Consultation; Triage.

RESUMO

INTRODUÇÃO: As primeiras consultas de oftalmologia, referenciadas pelos médicos de família (MF), colocam uma pressão significativa nos serviços. Existe pouca informação sobre os principais diagnósticos e *outcomes* destas primeiras consultas em Portugal. Este estudo visa descrever os padrões de referenciação e os desfechos das primeiras consultas no serviço de Oftalmologia da Unidade Local de Saúde de Entre o Douro e Vouga.

MÉTODOS: Dois médicos analisaram referenciações e primeiras consultas realizadas durante os primeiros cinco meses de 2023. Foram recolhidas informações demográficas, justificações para referenciação e registos de consulta. Os motivos foram categorizados e os diagnósticos estratificados de acordo com as categorias do ICD-10. As consultas foram classificadas com base nos *outcomes*.

RESULTADOS: Foram analisados 4917 pares referenciação-consulta, com 207 excluídos por dados incompletos. As principais razões de consulta foram a diminuição crónica da acuidade visual (65,2%), o rastreio de retinopatia diabética (11,6%) e o desconforto ocular (4,9%). Cerca de 58,8% (n=2892) das consultas resultaram em alta, 22,2% em cirurgia, 11,1% em referenciação para subespecialidade e 4,2% em seguimento. Dos pacientes com alta, 50,3% receberam uma nova refração, 32,6% não tiveram intervenção específica e os restantes receberam lubrificação, tratamento médico ou instruções de vigilância. A cirurgia mais comum foi a de catarata (69,4%) e as subespecialidades mais referenciadas foram glaucoma (21,5%) e retina médica (20,4%). Existiu uma percentagem considerável de dados incompletos (3,2%) e de consultas duplicadas (0,7%).

CONCLUSÃO: Este estudo oferece uma nova perspetiva sobre os padrões de primeiras consultas de oftalmologia em Portugal. A maioria dos casos referenciados é de baixa gravidade, passível de gestão conservadora. Refletir sobre o papel do MF no processo de referenciação é essencial, considerando a carga de consultas nos cuidados primários que são destinadas à referenciação hospitalar. Novas estratégias de triagem são importantes para reduzir as referenciações desnecessárias, garantindo que apenas aqueles que necessitam de cuidados especializados sejam encaminhados. Isto reduziria a carga de trabalho dos MF, criaria um sistema mais eficiente e melhoraria o acesso aos cuidados de saúde ocular.

PALAVRAS-CHAVE: Cuidados de Saúde Primários; Oftalmologia; Portugal; Referenciação e Consulta; Triagem.

INTRODUCTION

Vision is a fundamental sense that plays a crucial role in an individual's development, quality of life, and overall well-being. Globally, 2.2 billion people suffer from visual impairment, with 1 billion cases being preventable or treatable.[1] In Portugal, around 4 million people are affected by visual issues, primarily refractive errors, cataracts, and age-related macular degeneration.[2,3]

As the population ages, the demand for accessible eye care services increases. A study estimated the economic impact of vision impairment among Portuguese individuals over 50 years at 203 to 722 million euros annually, highlighting the importance of efficient eye care.[4] Adequate investment in visual health is essential, not only to enhance productivity and reduce healthcare costs but also to improve the quality of life for those affected.

Despite advancements in eye care, there are still challenges in ensuring equitable access to ophthalmologic services, particularly in primary care settings. First consultations or "outpatient consultations", referred by family doctors or general practitioners (GPs), place a significant strain on ophthalmology departments, as they constitute the primary entry point for most patients seeking eye care through the Portuguese National Health Service (SNS). Other, less common, referral sources include private ophthalmologists, optometrists, urgent cases seen by physicians in emergency settings and referrals from other hospital specialties. Notably, 57.2% of the population relies on private healthcare for their ocular needs, highlighting the difficulty in accessing public ophthalmology services, particularly for the elderly population.[5] Importantly, for patients to access ophthalmologic care in the SNS, they must first see a GP, who conducts the initial ophthalmologic assessment, regardless of the complexity of their condition. There is an alternative pathway, though infrequent, in which private practitioners can refer patients directly to an ophthalmology consultation. In the end, ophthalmologic services often become overwhelmed with non-urgent outpatient consultations, limiting the time available for complex or chronic cases that require more detailed management.[3]

Typically, the referral process begins when a patient pre-

sents to their GP with ophthalmic complaints. If deemed necessary, the GP submits an electronic referral request, which is subsequently triaged at the hospital. It is important to note that the GP, together with the patient, can decide which hospital to refer to, as the request can be directed to any hospital nationwide. If the referral is appropriate, an appointment (first consultation) is scheduled. Normally, this appointment is viewed as a comprehensive evaluation and, depending on the clinical scenario, the patient may potentially be guided to a subspecialty or surgery. While some patients with acute conditions may be sent directly to the emergency department, this study focuses on the routine outpatient referral pathway. Fig. 1 illustrates a patient's journey to be seen by an ophthalmologist, a process that often involves prolonged waiting times. A 2019 report further emphasized delays in access, with median wait times of 6 months for consultations and a 23.2% increase in surgical wait times from 2015 to 2017.[4] Inefficient triage and limited pathways contribute to this burden, affecting the quality of ophthalmic care.

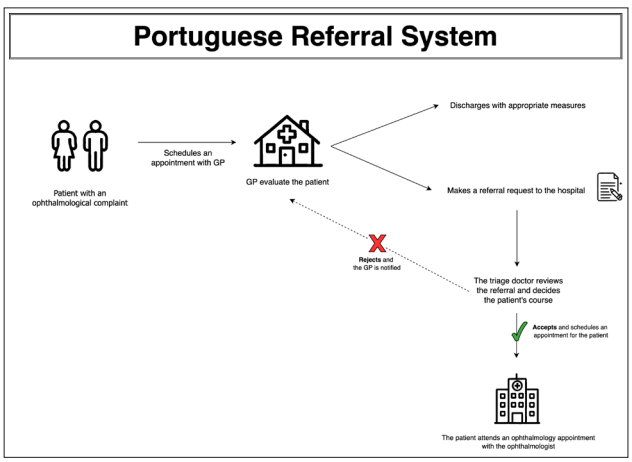

Figure 1. Flow of the patient's journey to the ophthalmologist.
GP – General Practitioner.

Notably, to access ophthalmologists within the SNS, even for minor issues—such as obtaining lubricating eye drops for dry eye disease or updating refractive prescriptions—in most cases patients tend to go through the entire referral process. This significantly adds to the burden on ophthalmologic services in Portuguese hospitals.

Despite the system remaining largely unchanged over the last decade, there is limited data on the diagnoses and outcomes of these initial consultations in Portugal. In response to this gap, this study aims to describe the referral patterns and outcomes of first consultations in the Ophthalmology Service at the Unidade Local de Saúde de Entre o Douro e Vouga.

METHODS

A retrospective analysis was conducted of all hospital referrals and consultations from the outpatient setting to the Ophthalmology Department of Unidade Local de Saúde (ULS) Entre Douro e Vouga, a secondary hospital, between January 2023 and May 2023. From May to September 2024, data collection was performed by the authors through a review of medical charts and databases, utilizing electronic patient records and the institution's information system (SClínico®) as data sources.

A list of all first-time consultations referred within the specified period, along with their corresponding referral requests, was extracted. Inclusion criteria were first-time consultations originating from an accepted referral request by a GP. Exclusion criteria were consultations referred from other sources (e.g., other departments or hospital specialties) and follow-up appointments. Automatically extracted data included patient ID, birthdate, referral request ID, date of referral, and date of consultation. Subsequently, the authors manually accessed all records and analyzed both the referral and its corresponding medical chart as a pair. The patient's age was considered as their age at the time of the first consultation.

Regarding data from the referral request, the following variables were considered: priority level assigned by the GP, classification of the clinical justification for the referral into 18 categories, whether the patient's visual acuity was documented, and whether a diagnostic hypothesis was provided by the GP. In cases with multiple reasons listed, the first was categorized. The following categories were considered: acute vision loss (<3 months), chronic vision loss (>3 months), diabetic retinopathy screening, screening due to family history, routine screening, ocular discomfort, diplopia or strabismus, floaters, metamorphopsia, oculoplastic issues, loss to follow-up, return to follow-up, retinal pathology, positive visual screening, headaches, epiphora and other reasons. The "return to follow-up" category was assigned if the patient had previously been discharged with a recommendation for long-term follow-up (usually >1.5 years). If a diagnostic hypothesis was present, it was classified based on the primary diagnosis, and it was noted whether prior ophthalmology evaluation had occurred: either from a physician from our service in the emergency department, from another ophthalmologist (at another public hospital or private provider) or after preliminary visual assessment by an optometrist.

For clinical data, variables analyzed included any previous consultation in our service within the preceding 18 months, the main diagnosis concerning the consultation reason and the physician's decision (discharge, surgery, follow-up or subspecialty referral). In cases where patients were discharged, actions taken (prescription of a new refraction, lubrication, or the need for follow-up ophthalmologic surveillance) were recorded. For patients referred to a subspecialty, the specific subspecialty was recorded. Similarly, for those proposed for surgery, the type of surgical procedure was specified.

To systematize and standardize the analysis of both the referral and medical records, the authors classified the main diagnosis into categories based on Chapter VII (Diseases of the Eye and Adnexa) from the International Classification of Diseases (ICD-10).[6] Details of this classification and the categories considered are listed in Table 1. Specifically, the authors chose to divide the first chapter, "Disor-

Table 1. Chapter VII (Diseases of the Eye and Adnexa) of ICD-10 and categories considered in this study.

Diseases of the Eye and Adnexa – ICD-10	Considered categories
H00-H06 - Disorders of eyelid, lacrimal system and orbit	Eyelid/lacrimal
	Dry eye
H10-H13 - Disorders of conjunctiva	Conjunctiva
H15-H22 - Disorders of sclera, cornea, iris and ciliary body	Sclera, cornea and iris
H25-H28 - Disorders of lens	Lens
H30-H36 - Disorders of choroid and retina	Choroid/retina
H40-H42 - Glaucoma	Glaucoma
H43-H45 - Disorders of vitreous body and globe	Vitreous
H46-H48 - Disorders of optic nerve and visual pathways	Optic nerve
H49-H52 - Disorders of ocular muscles, binocular movement, accommodation and refraction	Refractive errors
	Strabismus
H53-H54 - Visual disturbances and blindness	Visual disturbances
H55-H59 - Other disorders of eye and adnexa	Other

ders of eyelid, lacrimal system and orbit," by separating patients diagnosed with dry eye disease. Similarly, refractive errors were separated within "Disorders of ocular muscles, binocular movement, accommodation and refraction." If no diagnosis was listed during the consultation, the patient was categorized as having "no diagnosis".

To minimize errors, the authors only considered diagnostic hypotheses that were directly relevant to the reason for consultation, excluding unrelated past medical history. Clinical records that were insufficient to extract the required variables were marked as incomplete. If a consultation was found to be a duplicate or not a first-time consultation, this was also recorded.

Categorical variables were analyzed descriptively with absolute and relative frequencies. Continuous variables were assessed using histograms and the Kolmogorov-Smirnov test. Continuous variables were described using the median and percentiles 25 (P25) and 75 (P75), for non-normally distributed data. Spearman correlation tests were used to check the association between age and consultation outcome. Comparative analysis between variable groups employed the Chi-Square test (X^2), with a p-value ≤0.05 considered statistically significant. All data analyses were performed using IBM SPSS Statistics 29.

All data remained anonymized. The study was conducted in accordance with the principles of the Declaration of Helsinki for the protection of human subjects in medical research. This study was approved by the Ethics Committee of ULS Entre Douro e Vouga with the registration number CES N.º 77/2024. Due to the retrospective nature of the study and the absence of user-identifying data, informed consent was waived.

RESULTS

Throughout the 5-month period, the authors identified 4917 pairs of referrals and first consultations to our service from GPs, with an average of 983 first consultations per month. The median age of patients was 65 years (P25 = 51, P75 = 74) ranging from 0 to 97 years, with 58.2% being female. The referral requests were made between July 2022 and May 2023, with a median waiting time of 147 days (P25 = 133, P75 = 160). Of the consultations, 9.9% involved indi-

Table 2. Frequencies of consultation reasons, records with visual acuity and with suggested diagnosis by the general practitioner.

Consultation reasons	n	%	% with recorded visual acuity	% with suggested diagnosis
Chronic vision loss	3190	65.2	10.5	25.3
Diabetic retinopathy screening	567	11.6	0	0.2
Ocular discomfort	239	4.9	4.6	13.4
Oculoplastic issues	149	3.0	0	69.1
Routine screening	129	2.6	3.1	49.5
Floaters	117	2.4	5.1	9.4
Other reasons	101	2.1	5.9	0
Return to follow-up	94	1.9	1.5	26.6
Diplopia or strabismus	78	1.6	7.7	76.9
Loss to follow-up	67	1.4	3.2	38.8
Positive visual screening	35	0.7	5.7	42.9
Screening due to family history	27	0.6	0	51.9
Headaches	24	0.5	16.7	12.5
Acute vision loss	23	0.5	13	34.8
Retinal pathology	23	0.5	8.7	78.3
Metamorphopsia	18	0.4	5.6	5.6
Epiphora	8	0.2	0	12.5
Total	**4889**	**100**	**7.9%**	**24.2**

viduals under 18 years old, 37.9% for those aged 18-64, and 52.1% for individuals aged 65 and older.

A total of 4917 referral requests were analyzed, of which 28 were considered invalid due to unavailable referral information. Of the 4889 valid records, the most frequent reasons were chronic vision loss, diabetic retinopathy screening, and ocular discomfort. Only 7.9% of the requests included information regarding visual acuity, and among those related to vision loss, only 10.5% mentioned the patient's visual acuity. This data is presented in Table 2.

Regarding the referral data, only 11.6% of the referrals (n=570) included prior ophthalmology information: 1.0% (n=49) from physicians in our service, 1.0% (n=50) from the emergency department of our hospital,

7.4% (n=363) with a referral letter from a private ophthalmologist,and 2.2% (n=108) with information from a visual assessment performed by an optometrist. Less than a quarter of the referrals (n=1185, 24.2%) included a possible diagnosis. The most mentioned diagnoses were lens disorders (54.9%), refractive errors (10%), and glaucoma (10%). Diagnostic hypotheses from GPs aligned with the ophthalmology team in 75.4% (864/1146) of cases, with the highest accuracy in oculoplastic diagnoses (88%) and lower accuracy

Table 3. Frequencies and distribution of physician attitudes.

Physician attitude according to consultation outcome	n		%	% of global[a]
Discharge - n (%)	**2892**			**61.1%**
No specific intervention		944	32.6	
New refraction		1456	50.3	
Lubrication		275	9.5	
Medical treatment		109	3.8	
Survaillance		108	3.7	
Surgery - n (%)	**1090**			**23.0%**
Cataract		757	69.4	
YAG capsulotomy		204	18.7	
Oculoplastic		95	8.7	
Retina		12	1.1	
Intravitreal injection		16	1.5	
Glaucoma		6	0.6	
Subspecialty - n (%)	**544**			**11.5%**
Glaucoma		117	21.5	
Medical retina		112	20.6	
Oculoplastics		86	15.8	
Pediatric and strabismus		85	15.6	
Surgical retina		61	11.2	
Cornea		31	5.7	
Refractive		29	5.3	
Neuro-ophthalmology		11	2.0	
Contactology		10	1.8	
Inflammation		3	0.6	
Follow-up - n (%)	**205**			**4.3%**

[a] Valid data (n=4731), with 31 cases excluded due to duplicate consultations and 155 cases excluded because of incomplete information.

Table 4. Top 5 major diagnostic ICDs per age group and frequencies of all diagnostic ICDs.

Age groups	Diagnostic ICD-10	n	%
0-3		**59**	
	No Diagnosis	33	55.9
	Strabismus	11	18.6
	Refractive errors	8	13.6
	Eyelid/lacrimal	4	6.8
	Visual disturbances	2	3.4
4-12		**287**	
	Refractive errors	146	50.9
	No Diagnosis	89	31
	Strabismus	24	8.4
	Conjunctiva	13	4.5
	Eyelid/lacrimal	6	2.1
13-17		**128**	
	Refractive errors	97	75.8
	No Diagnosis	13	10.2
	Strabismus	9	7
	Conjunctiva	2	1.6
	Eyelid/lacrimal	2	1.6
19-35		**245**	
	Refractive errors	166	67.8
	Eyelid/lacrimal	17	6.9
	No Diagnosis	13	5.3
	Sclera, cornea and Iris	13	5.3
	Conjunctiva	10	4.1
36-64		**1532**	
	Refractive errors	960	62.7
	Lens	160	10.4
	Eyelid/lacrimal	99	6.5
	Choroid/retina	58	3.8
	Glaucoma	57	3.7
65-79		**1906**	
	Lens	832	43.7
	Refractive Errors	572	30
	Choroid/Retina	157	8.2
	Glaucoma	91	4.8
	Eyelid/Lacrimal	86	4.5
>80		**574**	
	Lens	273	47.6
	Refractive errors	106	18.5
	Choroid/retina	80	13.9
	Glaucoma	35	6.1
	Eyelid/lacrimal	24	4.2
All		**4731[a]**	
	Refractive errors	2055	43.4
	Lens	1268	26.8
	Choroid/retina	299	6.3
	Eyelid/lacrimal	239	5.1
	No Diagnosis	189	4.0
	Glaucoma	188	4.0
	Dry eye	122	2.6
	Conjunctiva	113	2.4
	Sclera, cornea and Iris	77	1.6
	Vitreous	71	1.5
	Strabismus	68	1.4
	Visual disturbances	21	0.4
	Optic nerve	18	0.4
	Other	3	0.1

Table 5. Physician attitude according to each age group.

	Age Group														*p* value[a]
	0 - 3		4 - 12		13 - 17		19 - 35		36 - 64		65 - 79		> 80		
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	
Attitude															
Discharge	31	52.5	224	78	107	83.6	179	73.1	1180	77	979	51.4	192	33.4	<0.001
Surgery	0	0	0	0	1	0.8	8	3.2	176	11.5	649	34.1	256	44.6	<0.001
Subspecialty	27	45.8	42	14.6	10	7.8	48	19.6	119	7.8	201	10.5	97	16.9	<0.001
Follow-up	1	1.7	21	7.3	10	7.8	10	4.1	57	3.7	77	4.0	29	5.1	0.037
Total	**59**		**287**		**128**		**245**		**1532**		**1906**		**574**		<0.001

[a] *p* value of <0.05 is considered statically significant.

in strabismus (45.6%) and refractive errors (46.1%).

Regarding clinical data, 5.5% (n=269) of patients had a consultation in our service recorded in the previous 12 months. In 31 cases (0.06%), the patient was already being followed in the ophthalmology department, and in 155 cases (3.2%), the physician data was incomplete, preventing diagnostic and outcome conclusions. Among the valid data (n=4731), 61.1% of first consultations resulted in patient discharge, 23.0% led to surgery, 11.5% and 4.3% required follow-up.

Table 3 lists the specific approaches according to the main outcomes. Among discharged patients, 92.4% received conservative treatment, which included lubrication, new refraction, or no specific intervention. The most common surgery was cataract surgery, followed by posterior YAG capsulotomy and oculoplastic surgery. The most frequently requested subspecialties were glaucoma and medical retina, with immunopathology and contactology being the least requested.

The most prevalent groups of ophthalmologic diseases were refractive errors (43.4%) and lens diseases (26.8%), particularly among those aged 36-64, 65-79, and >80. Most children aged 0-3 had no pathological diagnosis, while refractive errors were most common in patients aged 4 to 64. More details are provided in Table 4.

The median age of discharged patients was 61 years (P25 = 46, P75 = 70), while it was 72 years (P25 = 62, P75 = 78) for those not discharged (p<0.001). The median age for patients proposed for surgery was 74 years (P25 = 67, P75 = 79) compared to 62 years (P25 = 46, P75 = 72) for those not proposed for surgery (p<0.001). Spearman's correlation revealed a positive significant association between age and surgery occurrence (r = 0.372, p< 0.001), and a negative association between age and discharge occurrence (r = -0.302, p< 0.001). There were no significant differences in subspecialty referral or follow-up groups. Table 5 shows that, except for the >80 age group, discharge was the most common outcome, especially in the 4-12, 13-17, 19-35, and 36-64 age groups. There was a significant association between age groups and physician approaches.

DISCUSSION

This study provides valuable insights into the referral patterns and outcomes of first-time ophthalmology consultations in a Portuguese hospital setting. Our findings highlight several key areas for improvement in managing outpatient ophthalmologic care, aligning with broader challenges identified in previous national studies.[3,4]

The median age of our patient cohort was 65 years, reflecting the increased demand for ophthalmologic care in an aging population. This is consistent with global trends indicating a higher prevalence of visual impairment among older individuals.[7,8] Our data showed that chronic visual acuity reduction was the most common reason for referral, consistent with previous studies in Portugal.[9] However, only one in ten referrals included information about visual acuity. This suggests a less rigorous referral process, and the predominance of this reason may reflect a lack of precision in ophthalmologic language, where "hypovision" can be considered a vague complaint.

Additionally, only a quarter of referrals included a diagnostic hypothesis, with lens disorders being the most frequent, consistent with an Australian study.[10] This may highlight a gap in ophthalmologic knowledge or diagnostic confidence at the primary care level, potentially leading to unnecessary referrals.[11] It prompts reflection on the role of GPs in ophthalmologic triage, as they are required to assess eye symptoms without the specialized instruments and training necessary for accurate diagnosis.[9] This is evident from the fact that GPs were most accurate in diagnosing oculoplastic and external diseases, conditions more easily assessed in a general practice setting. Anterior and posterior segment pathologies are difficult to evaluate without the proper tools. This makes the triage process inefficient, with many patients referred for general symptoms without specific diagnoses.

In many European countries, such as the United Kingdom or Belgium, patients can access ophthalmologic care directly, either through an ophthalmologist or an optometrist.[12] Our study shows that at least 11.6% of patients had previously been referred by an ophthalmologist or optometrist and, to receive specialized ophthalmologic care through the SNS, they had to undergo an additional GP consultation simply to obtain a formal referral. If the GP consultation served only as an intermediary in the referral pathway, during the study period, approximately 570 GP consultations were scheduled at our ULS without adding any healthcare value, representing a bureaucratic barrier to ophthalmologic

care. More efficient strategies, such as direct entry onto the ophthalmology waitlist without the need for a GP consultation, should be explored. We should also investigate these alternative referral pathways with pilot projects involving artificial intelligence (AI) powered tools and orthoptists integrated into primary care. These professionals could screen patients and refer them directly to ophthalmology services within or outside the SNS system.

In terms of outcomes, 61.1% of patients were discharged after their first consultation, with most receiving conservative treatment. To our knowledge, no other study has evaluated first consultation outcomes in ophthalmology, as most literature focuses on urgent referrals.[11,13] This finding raises the question of whether these consultations could have been managed through alternative pathways, such as AI and optometrists, reducing the burden on hospital services. This conclusion aligns with the 2019 national report, which advocated for alternative pathways to improve access to eye care in Portugal.[4] Utilizing AI with ophthalmic technicians could further improve access in remote areas, as tests could be electronically analyzed by specialists from other regions.

The high prevalence of cataract surgery and posterior capsulotomy aligns with the known prevalence of lens-related visual impairment in older populations.[14,15] Subspecialty referrals, mainly to glaucoma and medical retina, further reflect the growing burden of chronic eye diseases requiring ongoing management and follow-up. Regarding the primary diagnoses, most were related to refractive errors, lens disorders, retinal pathology, and eyelid/lacrimal pathology. Due to the study design, other frequent ophthalmologic diagnoses, such as dry eye disease or corneal/conjunctival pathology, may have been underestimated. In ophthalmology, patients often present with multiple diagnoses, but this study focused on the main diagnosis related to the consultation reason and physician evaluation. Therefore, the results should be interpreted as representing the most common diagnoses associated with consultation outcomes, rather than the overall prevalence of these conditions in the population.

It is also important to note the percentage of cases with incomplete information. Although low, incomplete records hinder the accurate assessment of a patient's condition and outcomes, a challenge is also reported in the literature.[16] With time, AI and machine learning algorithms may streamline data entry processes.[17] Until then, efforts should be made to ensure complete clinical records for the benefit of patient safety, care quality, and healthcare efficiency.

Additionally, while GP referrals represent the primary entry point to ophthalmology services, other pathways include follow-ups from emergency department cases, referrals from other hospital specialties, and population screening programs. In Portugal, there are organized screening programs for diabetic retinopathy and pediatric visual screening. These programs enable direct referral for positive cases to ophthalmologic evaluation by a specialist. As a result, the percentage of patients with retinal pathology, pediatric refractive errors and strabismus might be lower than expected, as many cases are not included in this analysis. Despite the existence of a national screening program, 11.6% of consultation requests were for diabetic retinopathy screening, indicating possible issues with the program's availability or duplicated referrals. This percentage is consistent with a previous report in Portugal.[9] Indeed, several cases involved patients already under ophthalmologic follow-up for positive screening results, suggesting redundancy. Further studies are needed to explore these issues.

Regarding ophthalmology consultations, more information is needed on the likely number of consultations required over time and whether specific age groups may need additional ophthalmologic examinations. In our study, we concluded that for patients aged 4 to 64, the vast majority were discharged, and in the absence of risk factors or family history, a follow-up after a certain time frame may be appropriate. For older patients with more pathology, closer follow-up may be necessary. Pilot projects using data analytics could refine these criteria and ultimately optimize care, reserving hospital services for patients requiring specialized ophthalmologic treatment.

There may be an overestimation of subspecialty referrals and surgical outcomes due to our triaging process. In some specific cases, based on the information in the referral, triage doctors may allocate patients to a general consultation with a subspecialist ophthalmologist, which could bias the results. To simplify our data, we recorded such cases as subspecialty referrals when follow-up was planned within the subspecialty. This makes sense since the patient is being followed in the respective subspecialty, albeit earlier, by avoiding an extra consultation by someone not specialized in that area. This explains the identification of surgeries such as retinal or glaucoma procedures, which typically require a subspecialist's opinion. This "directed triage" benefits both the service and patients by reducing wait times and the need for general consultations, improving service efficiency, but it does limit the generalizability of our study's data.

Other limitations of this study include its retrospective design and reliance on electronic health records. Moreover, manual data extraction may introduce human error, potentially affecting data reliability.

CONCLUSION

Outcomes of first-time consultations can effectively identify challenges in managing communication with primary healthcare. These findings may serve as a foundation for future interventions aimed at optimizing ophthalmologic care pathways and improving visual health outcomes for the population.

CONTRIBUTORSHIP STATEMENT / DECLARAÇÃO DE CONTRIBUIÇÃO

PCT, LF: Conceção do estudo, recolha e interpretação dos dados, redação e revisão do manuscrito.

CPA, JAA, JCP: Interpretação dos dados, redação e revisão crítica do manuscrito.

Todos os autores leram e aprovaram a versão final a ser publicada.

PCT and LF: Study design, data collection and interpretation, drafting and revising the manuscript.

CPA, JAA, and JCP: Data interpretation, writing and critical revision of the manuscript.

All authors read and approved the final version to be published.

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