

Brief Report

Eye Health Screening in Migrant Population: Primary Care Experience in Lazio (Italy) from the PROTECT Project

Alice Bruscolini ¹, Giacomo Visioli ^{1,*}, Marco Marengo ¹, Veronica Cherubini ¹, Anna Maria Comberiat ¹, Gaspare Palaia ², Massimo Ralli ¹, Livia Ottolenghi ², Alessandro Lambiase ^{1,*} and Antonella Polimeni ²¹ Department of Sense Organs, Sapienza—University of Rome, 00161 Rome, Italy² Department of Odontostomatological and Maxillofacial Sciences, Sapienza—University of Rome, 00161 Rome, Italy

* Correspondence: giacomo.visioli@uniroma1.it (G.V.); alessandro.lambiase@uniroma1.it (A.L.)

Abstract: Italy is a natural corridor for entry into Europe, receiving thousands of refugees and migrants needing socio-economic and health assistance yearly. Impaired vision due to eye disease is estimated to affect at least 2.2 billion people worldwide, especially in this underprivileged population. To overcome this deep disparity, new intervention strategies, such as the PROTECT project, were planned with the aim of assessing, in the context of the head–neck area, the eye health in vulnerable applicants and holders of international protection. A total of 3023 migrants were involved in the project. Demographic factors and eye history were collected using a questionnaire. Using portable diagnostic instruments, an eye screening including monocular visual acuity, intraocular pressure, anterior segment, and ocular fundus was performed. The mean age was 31.6 ± 13.1 years and more than 50% underwent the first eye evaluation. Vision impairment was claimed by 16.6% of subjects and the most frequent diseases diagnosed were: refractive errors (11%), strabismus (6%), red eye (6%), cataract (5.3%), and ocular hypertension (1%). Retinal alterations were observed in 5% of migrants. The PROTECT project allows us to increase the accessibility of head–neck disease prevention care. Moreover, our results confirm the utility of an eye screening assessment for early identification of the most relevant and preventable ocular diseases, especially in disadvantaged populations.

Keywords: impaired ocular vision; ocular diseases; screening; migrants; vulnerability; cooperation; hospitality



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1. Introduction

Eye health and vision have profound and widespread implications for many aspects of life, health, sustainable development, and the economy. Currently, many people, families, and populations continue to suffer the consequences of vision impairment and blindness [1,2].

Eye conditions causing low vision and blindness are remarkably common. It is estimated that almost all individuals will experience impaired vision or an eye condition during the life course and require eye care services. According to the latest World Health Organization (WHO) Report on Vision, at least 2.2 billion people worldwide have impaired vision due to either eye diseases (age-related macular disease, cataract, diabetic retinopathy, glaucoma) or uncorrected refractive errors. In at least 1.1 billion of these cases, vision impairment could have been prevented or has yet to be addressed with associated highly cost-effective interventions [1]. By 2050, this figure is expected to rise to 1.8 billion [1,3]. Accordingly, the leading causes of vision impairment are uncorrected refractive errors and cataracts [3,4]. Since these conditions can be effectively corrected or treated, early detection may improve clinical outcomes and reduce disease burden on patients and society. In addition, recent data showed an increasing prevalence of pediatric uncorrected refractive error worldwide which may cause amblyopia. It is the most common cause of impaired monocular visual acuity in children, and is treatable if diagnosed early with great functional success [5].

The burden tends to be greater in low- and middle-income settings among older people, in women, and in rural and disadvantaged communities due to fewer opportunities to access the most essential eye care services [6,7]. Due to its central position in the Mediterranean Sea, Italy represents an interesting country to explore this issue as it constantly receives migrants coming from different countries [8].

At the end of 2021, the total number of accommodated asylum seekers and beneficiaries of international protection in Italian centers such as CAS (Emergency Accommodation Centre) and SAI (System of Accommodation and Integration) was 78,001. The region of Lazio accommodated the fourth largest number of migrants in Italy after Lombardy, Emilia Romagna and Piedmont (12.6%, 10% and 9%, respectively), with a total of 6813 (8.6%) [9]. Expectably, in the regions with the highest amount of asylum seekers, socio-economic integration and health care was a tough challenge [10,11].

In Italy, according to Italian legislation, within the framework of the National Plan for the Integration of Internationally Protected Persons, the planning of integration policies, including health care, is a regional prerogative [12]. Local authorities and not-for-profit organizations may request funding from national or EU funds for projects designed to improve the integration of the migrant population including health screening. In this regard, the “Migration and Integration Asylum Fund 2014–2020” (AMIF) is a financial instrument established by EU Regulation No. 516/2014 with the objective of promoting an integrated management of migration flows supporting all aspects of the phenomenon: asylum, integration and return [13]. Through the AMIF fund, the Italian Ministry of Internal Affairs financed the PROTECT project. PROTECT (“Patologie del distretto TEsta-Collo nei minori migranTi. Dalla formazione degli operatori alla diagnosi precoce e presa in carico del paziente: Network Odontoiatrico, Oftalmologico, Otorinolaringoiatrico e Maxillo-Facciale”) is a multidisciplinary project of secondary prevention of ophthalmic, oral and dental disease in migrant and vulnerable populations. It was carried out by the Hospital-University Polyclinic Umberto I (Department Integrated Head–neck), in collaboration with the Departments of Sense Organs and the Department of Odontostomatological and Maxillofacial Sciences of the Sapienza—University of Rome, Lazio [14]. PROTECT project results from oral screening have been already made available and dental pathologies turned out to be widespread and often neglected in asylum seekers, with a high relative abundance of malocclusions and carious lesions. Furthermore, results from this screening have confirmed the crucial role of prevention in a low-income setting to reduce hospitalizations and worsening problems [15].

Regarding eye screening, the role of prevention of ocular pathologies in the general population had been extensively discussed, with a relevant reduction of complications especially in diabetic patients [16,17]. Many studies have previously investigated visual health and visual healthcare access in refugees or displaced persons, with a prevalence of blindness ranging from 1.6 to 26.2% and a high prevalence of ocular infectious diseases such as trachoma [18]. However, scarce real-world data regarding ocular health in the setting of asylum seekers or beneficiaries of international protection are currently available.

The aim of this paper is to describe the results of the ophthalmological screening from the PROTECT project and to discuss the social and medical need of early diagnosis and vision impairment management, especially in vulnerable populations.

2. Materials and Methods

This is a national cross-sectional study (“PROTECT” project) conducted among the refugee and migrant population present in the Lazio region, Italy, from February 2018 to September 2021. The vision health of 3023 participants was assessed in a network of 53 cultural associations and reception centers. This study adheres to the tenets of the Declaration of Helsinki for research involving human subjects, and the “PROTECT” project was approved by the Ethics Committee of the Department of Odontostomatological and Maxillofacial Sciences of the Sapienza—University of Rome (Protocol identifying number: 0000839 on 2 October 2018). The ocular screening was performed by trained ophthalmol-

ogists and optometrists of the Department of Sense Organs of the Sapienza University—Rome at the clinics of the Policlinico Umberto I University Hospital or at the reception centers using mobile units.

2.1. Data Collection

A screening folder was prepared by the project staff to identify subjects with eye diseases requiring additional specialized care. Red or yellow codes were used to label the severity of the disease. The screening data were collected via a health survey in order to achieve details on basic demographics, time since the last eye examination, and state of eye health. Using a binocular portable refractometer device (EsaVision Adaptica 2 WIN), all participants underwent ophthalmological examination for assessment of the following clinical data: objective refraction, ocular motility, and presence of the major amblyogenic factors such as anisometropia, anisocoria, and media opacities. Visual acuity was measured using the subjective refraction method with a Snellen chart, and patients with visual acuity of less than 20/40 were referred for further visual examination in a specialist clinic. Intraocular pressure was evaluated with a rebound tonometer (iCare TA01i tonometer) [19]. Moreover, the presence/absence of ocular surface inflammation (red eye) and macular area disease were recorded in the medical sheet using Smartscope PRO (Optomed, Finland) handheld, a lightweight and affordable fundus camera [20].

2.2. Questionnaire

The questionnaire was applied individually through an interview with the help of a linguistic mediator. It included items related to sociodemographic variables and ocular health as shown in Table 1.

Table 1. Questionnaire applied at the time of enrollment to assess ocular health.

1. Sociodemographic Variable	Answers (Yes/NO/NA)
Full name	
Gender	
Age (years)	
Country of origin	
Pre-disposing conditions/family history	
2. Ocular Health-Related Behaviors	
Do you have ever had an eye evaluation?	
Do you have previous eye injuries?	
Do you use eyeglasses?	
Do you have visual impairment?	
Do you have ocular pain right now?	

2.3. Clinical Examinations

All subjects underwent the following evaluations: (i) autorefractor exam; (ii) eye motility and stereopsis; (iii) distance and near visual acuity using the Snellen Tumbling E Charts at distance and near; (iv) intraocular pressure with no contact tonometry; and (v) segment anterior and macular photograph.

In order to detect the possible cause of preventable vision impairment, the variables analyzed were: type of refractive error, number (%) of the subject with visual acuity <20/40 at distance, and cataract. In addition, we assessed the presence of ocular signs of disease requiring urgent care (red card), such as infective or neoplastic disease, or minor urgency (yellow card), such as glaucoma suspicion (intraocular pressure > 20 mmHg) or retinal abnormalities. Patients who needed further ophthalmologic evaluation after

the screening received assistance by joining the healthcare network of the Policlinico Umberto I Hospital.

2.4. Data Analysis

Data were analyzed using standard statistical analysis software (version 20.0, Statistical Package for the Social Sciences, IBM Corporation, Armonk, NY, USA). A database was developed using Excel (Microsoft, Redmond, WA, USA). Descriptive statistics including mean \pm SD values and percentage were calculated for each variable.

3. Results

A total of 3023 patients were involved in the project PROTECT. The mean age was 31.6 ± 13.1 years, and among all the subjects 2058 were male (68.1%) and 965 were women (31.9%). The geographical origin of the subjects is illustrated in Figure 1.

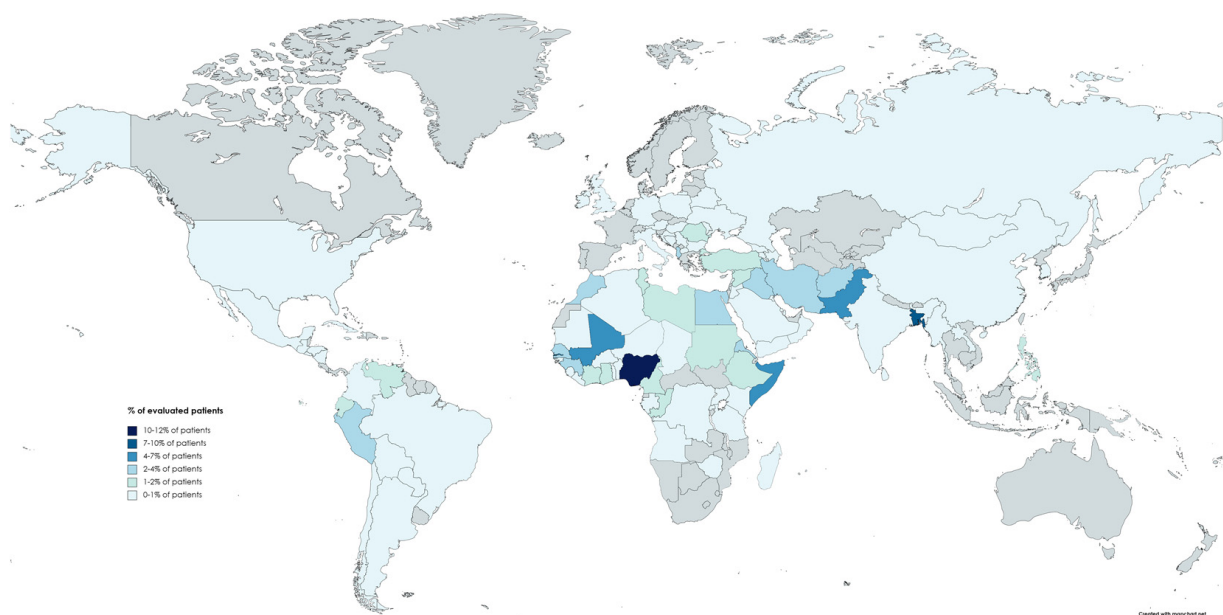


Figure 1. World map representing the geographical origin of the screened subjects. Of note, 10.3% of the screened migrants were Nigerians, 7.6% Bangladeshi and 5.6% Pakistani.

The questionnaire replies showed that 50.4% of subjects had never had an eye examination, with an additional number who were unable to provide a definitive response (8.9%). Most participants (86.2%) were unaware of their family's medical history. In addition, most of the patients claimed vision impairment (16.6%), ocular pain (6.6%), and previous history of ocular injury (5.2%). Finally, the use of eyeglasses was reported by 12.0% of the sample. A summary chart is reported in Figure 2.

The most frequent eye alteration in our population was a refractive error; in fact, this was found in 11% of all participants, and it was distributed between myopia (9.8%) and hyperopia (1.2%) among all subjects.

Visual acuity evaluation showed that 9.6% of subjects had uncorrected vision acuity (UCVA) less than 20/40 associated with ocular motility alterations and stereopsis loss.

The overall prevalence of other eye diseases including strabismus (6%), red eye (6%), cataract (5.3%), and IOP values above 20 mmHg (1%) is represented in Figure 3.

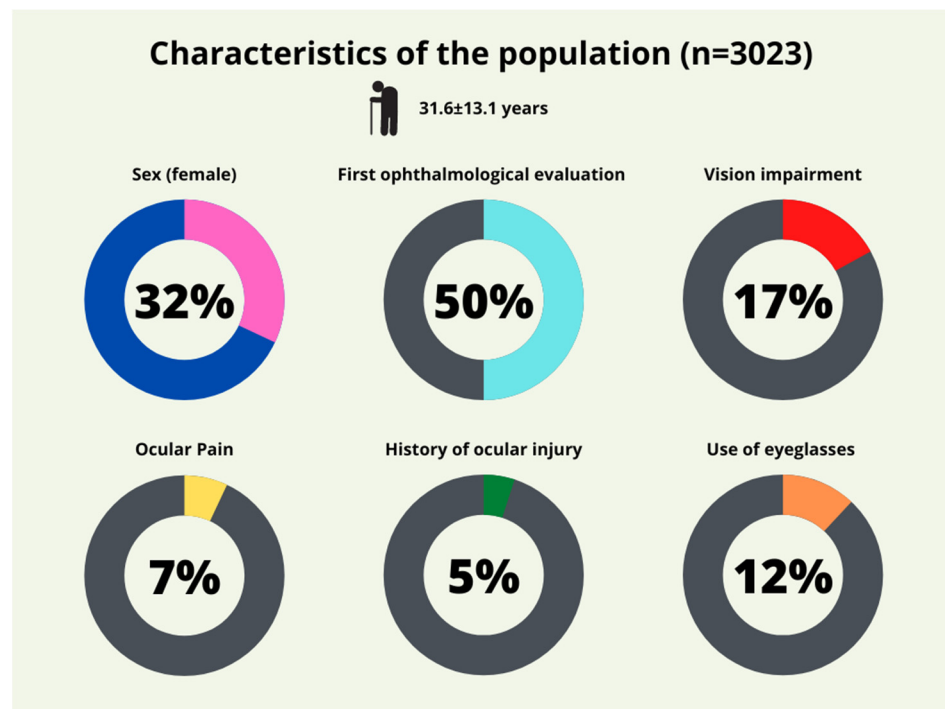


Figure 2. Main characteristics of the screened population. Of note, more than 50% of migrants underwent the first ophthalmological evaluation.

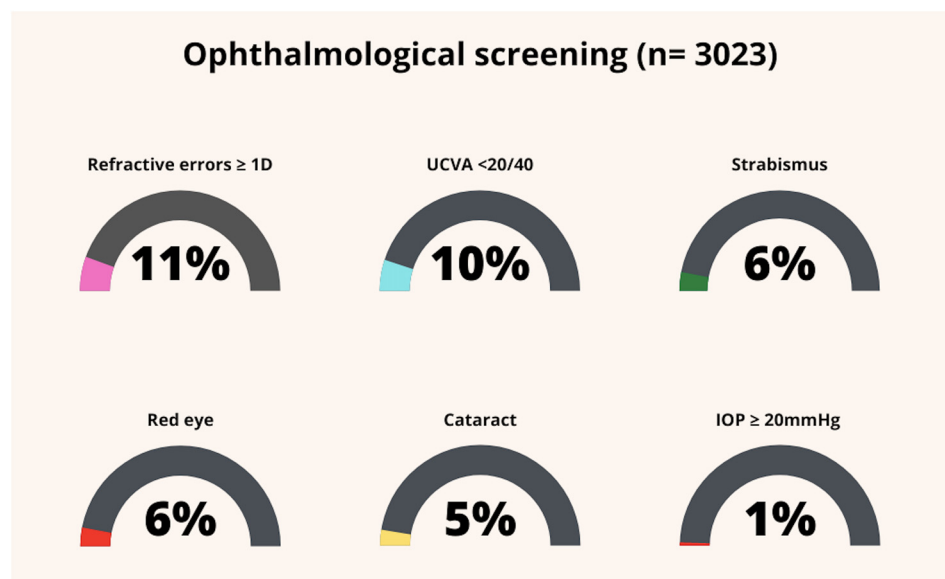


Figure 3. Principal findings of the ophthalmological screening within the PROTECT project. Of note, refractive error represented the main cause of vision impairment.

The frequency of ocular fundus changes was 5%, with several possible causes shown in Figure 4. In particular, ten subjects had isolated cotton wool spots and four participants showed some microaneurysms without a documented history of diabetes that required further examination in a specialist hospital. Indeed, 60% of patients with optic nerve abnormalities had bilateral symmetric changes in terms of cup disc ratio.

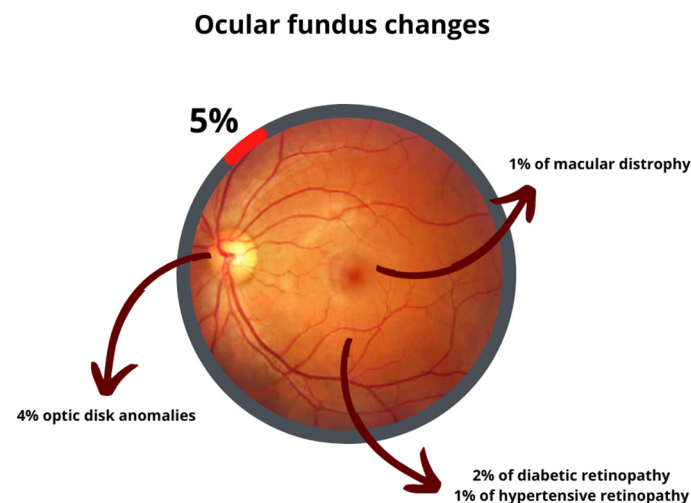


Figure 4. Principal retinal findings of the screened migrants within the PROTECT project. Of note, in certain cases, multiple findings coexisted in the same patient.

In addition, during ophthalmological screening 18 of 51 subjects with red eyes showed signs of acute conjunctivitis and were sent for urgent care to a specialist eye clinic.

More than 30% of the total population screened were referred to the Policlinico Umberto I University Hospital Medical Center to carry out further investigations such as: correction of refraction error with eyeglasses, strabismus treatment, management of ocular surface inflammation, cataract surgery evaluation and investigations to identify glaucoma early.

4. Discussion

Screening for vision impairment is a highly effective way to prevent long-term disability, as recently reiterated by the WHO [2]. A few studies have addressed eye health among migrant populations, especially in Italy, and the PROTECT project is the first Italian project tailored to the head and neck health of a wide sample of fragile populations that live in reception centers and have several different demographic origins [14].

Indeed, very few screening tools have been validated for diagnosis accuracy among migrants overall, and several heterogeneous data have been reported on the ocular health of migrants in the world, highlighting the lack of proper medical care for this fragile population. In fact, while a reduction in visual impairment in high-income countries has been described, migrants and vulnerable populations that live in these European countries experience obstacles to health care access. As shown in our study, about 50% of migrants carried out their first ophthalmological visit during this screening project and about 9% of subjects could not report if they had a previous eye exam. These data, in line with the previous evidence, suggest a potential increased risk of amblyopia [21]. This defect of vision becomes irreversible in adulthood, affecting the quality of life, and interfering with the ability to socialize and work. Recent studies showed that screening for amblyopia is cost-effective, but highly related to long-term impacts of unilateral loss that are common in migrant populations.

In fact, analyzing the answers to the questionnaire, the presence of vision impairment or ocular pain (the main reasons for a request for an eye examination in the Italian population) was reported by 17% and 7% of subjects, respectively.

The PROTECT project result showed that an easy and fast eye screening with portable technologies is able to highlight the main causes of visual problems and to plan specific management of the patient with different levels of urgency [22]. In addition, the strategy of our screening, based on a non-invasive assessment and in many cases carried out directly at the center of reception, has allowed the obtaining of good compliance by these vulnerable subjects often reticent to visits and treatment [23].

According to evidence, the eye screening results indicate that uncorrected refractive error was the more frequent finding associated with visual impairment, and patients were referred within 30 days (yellow card) at the optometrist clinic to evaluate the prescription of eyeglasses and associated ocular motility alterations. A special agreement with a large private company for the provision of spectacles for refugees is fundamentally advisable to complete the management of vision impairment of this disadvantaged population.

Despite the sample's young average age, cataracts were the second most frequent cause of vision loss, likely related to traumatic or dysmetabolic diseases, and a second appointment in the specialist eye hospital was booked to follow up and manage the patients [24]. Interestingly, by using simple and rapid eye screening programs in the reception centers, the diagnosis of acute pathologies such as ocular hypertension and conjunctivitis, was performed, and urgent treatment or further investigations in specialist vision care were started (red card).

The few ocular fundus changes requiring further investigation were managed by the retinal specialist (yellow card) to diagnose dysmetabolic pathologies early, such as diabetes or hypertension, or to follow up on choroidal nevus. Optic disc abnormalities suggesting potential glaucoma disease showed a prevalence of 4%, although it is important to remember that the diagnosis of this pathology needs an evaluation of the optic disc by ophthalmoscopy exam with pharmacological mydriasis and instrumental examinations, such as the visual field carried and optical coherence tomography (OCT) [25]. Although the role of the digital fundus camera in glaucoma diagnosis during screening programs remains controversial due to the quality of photographs or algorithm performance, in our opinion, for the purpose of the PROTECT project, this diagnostic procedure proved to be a crude but useful evaluation to highlight the possible subjects at risk and to guide clinicians, as has been suggested recently [26–29].

In contrast to other studies, no age-related macular diseases were observed, and we suppose that these data are related to the average young age of the sample [30]. Our screening could not assess the presence of any retinal peripheral lesions at risk of retinal detachment. The weaknesses of this study are related to average age and heterogeneity of the sample. The young age is a great bias that influences the results of our study; in fact, we diagnosed a very low number of AMD and cataracts, which are usually related to age. In addition, scarce and limited evidence on ocular disorder prevalence in young immigrants with different geographical provenience has been published, as noted in a paper by Global Burden of Disease Study Blindness and Vision Impairment Collaborators [31], making it more difficult to assess the value of our results in immigration-related conditions.

An important enrichment in terms of care for these disadvantaged populations could also come from the use of teleophthalmology. In fact, also during this project, the restrictions linked to the COVID-19 pandemic led to the development of remote consultation systems to maintain a mode of assistance with the reception centers in the most critical periods [32].

5. Conclusions

The multidisciplinary approach to screening head and neck diseases has allowed the development of a network of care essential to meet the different medical needs of a fragile and neglected population with the aim to improve quality of life and socio/economic integration. A permanent head–neck care service for all fragile populations reaching our country is desirable and represents an innovative prevention service for the national health system.

In the future, the validation of clinical smartphone applications in ophthalmology will help to further improve the operation and cost of teleophthalmology in the field of prevention, so as to carry out not only remote screening programs but also monitor the course of diseases diagnosed with periodic follow-up. Indeed, it would be desirable to have a permanent channel of the first consultation with institutions hosting fragile people in order to create a rapid, effective and affordable system for the national health system.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on reasonable request from the corresponding authors, after board approval. The data are not publicly available due to informed consent restrictions.

Conflicts of Interest: The authors declare no conflict of interest.

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