Original Article

Ocular morbidity, visual impairment and its association with social factors in children attending primary healthcare services for any health-related problem in Pavagada, India – A health facility-based cross-sectional study

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Background: Primary eye healthcare in India has potential for improvement; enhancing it can play a role in universal health coverage, integrated people-centered eye care, and reducing the burden on overloaded secondary/tertiary facilities. **Purpose:** To assess the unmet need for primary eye care services in Pavagada taluk, Karnataka, India, by estimating ocular morbidity, blindness, and visual impairment among children <18 years, attending primary health centers for any health-related issue, and to examine their association with social factors. **Setting and Design:** Health facility-based cross-sectional study in primary health centers in Pavagada. **Methods:** Trained ophthalmic technicians used E charts, red reflex testing, and external examination to screen. Patients with vision <6/9, abnormal red reflex, or external examination were referred to the base hospital. **Statistical Methods:** The data was analyzed using STATA17. **Results:** Of 965 patients screened (mean [SD] age 6.87 [4.97] years), 125 were referred to the base hospital; seventy-two (57.5%) reported. The unmet need was 54% (39/72). Only 9/39 (23%) had major ocular morbidity necessitating secondary/tertiary care. Ocular morbidity was 8.60%, with uncorrected refractive errors predominant (6.84%). Visual impairment rates were lower among children of mothers with 8–12 years of education (13.64%), housewives (7%), upper-middle-class (0%), compared to those with no formal education (25%), non-agricultural laborers (29%), middle (22%), lower-middle class (17%), respectively. **Conclusion:** Pavagada taluk has a significant unmet need for primary eye care services. Addressing this requires improving infrastructure, manpower, and training at existing health centers to provide primary eye care services and alleviate the burden on secondary/tertiary care facilities.

Access this article online

Website: https://journals.lww.com/ijo

DOI: 10.4103/IJO.IJO_1040_24

Quick Response Code:

Key words: Eye diseases, pediatric, primary healthcare, social factors, visual impairment

The Lancet Global Health Commission (2021) emphasizes the importance of integrating pediatric primary eye healthcare (PEHC) into general health services.[1] PEHC is important because: (a) though only 3% of the world's blind population are children, the number of 'blind person years' resulting from childhood blindness is second only to age-related cataracts.[2] (b) Conditions like vitamin A deficiency, measles, prematurity, congenital rubella syndrome, and meningitis,[3] associated with blindness also cause child mortality; (c) Childhood blindness affects psychological, educational, and socioeconomic aspects and extends into adulthood.[4] Early treatment is vital because of amblyopia, which can only be treated in early childhood.[5] PEHC enables early detection of eye diseases, as primary health workers regularly interact with children for immunizations, vitamin A supplementation, and growth monitoring.[6] To date, there is no data on the prevalence of ocular morbidity (OM), blindness, and visual impairment (BVI) in children attending primary health centers.

However, a recent study by Kalita RI *et al*.,[7] in six vision centers of a tertiary eye care hospital, in southern India, says that only 1/5th of the patients need a referral to the tertiary center proving that providing primary eye care services in PHCs can help in decreasing the burden on the secondary/tertiary eye care.

Objectives

1. To estimate the prevalence and causes of OM, BVI in patients <18 years attending primary health center (PHC) Lingadahalli and community health center (CHC) YN Hoskote, over a period of one month, for any health-related problems (fever, diarrhea, immunization, etc.), in Pavagada taluk in southern India.
2. Investigate the association between BVI and social factors (education, occupation of the mother, and socioeconomic status) in the above population.

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Received: 04-May-2024 Revision: 17-Dec-2024
Accepted: 18-Dec-2024 Published: 24-Apr-2025

Cite this article as: Kemmanu V, Naresh PV, Bunce C, Hudedagaddi KP, Abhishek D, Chandrakala GR, *et al*. Ocular morbidity, visual impairment and its association with social factors in children attending primary healthcare services for any health-related problem in Pavagada, India – A health facility-based cross-sectional study. Indian J Ophthalmol 2025;73:695-701.

Methods

Setting

Two primary health centers in Pavagada, a socio-economically and educationally backward taluk in Tumkur district, Karnataka, with a projected (2021), mostly rural (88.4%) population of 250,630. The study was conducted between July 6 and August 10, 2023.

Ethics approval

Taken from the London School of Hygiene and Tropical Medicine and Indian Institute of Health Research and Management, Bangalore (as an independent ethics committee); state government permission to conduct the study in the public health facilities.

Study design

Health facility-based cross-sectional study.

Participants

Children <18 years of age, attending one PHC and one CHC for any health-related reason, over one month (July 6–August 4, 2023). Those aged above ≥18 years of age and children with acute illness were excluded.

Primary outcome

Prevalence and causes of OM and BVI by age and gender and associations between social factors and BVI were examined, comparing lower, middle, and upper socioeconomic groups.

Sample size calculation

The most common eye disease in a study conducted in vision centers in South India[7] was conjunctivitis (prevalence of 26%), which was taken as the prevalence for reference. With a 95% level of confidence, 5% precision, and 10% anticipated loss, the sample size was calculated as 329 (CI 21–31), using the Scalex SP[8] calculator.

Study size

Since the study period was one month, 965 eligible children were screened over that period, giving us an estimate with greater precision.

Data collection: [Fig. 1]

Human resource and training

Two final-year Diploma in ophthalmic technology (DOT) students and a General Nursing and Midwifery (GNM) professional were provided a detailed briefing through a PowerPoint presentation outlining the study's aims and objectives, by the principal investigator. Hands-on skills in the assessment of vision using the E chart, red reflex examination with the direct ophthalmoscope, external examination of the eyes with torch light, and the use of a pre-designed questionnaire and evaluation form were taught, supplemented by a PDF guide detailing consent procedure, questionnaire administration, vision assessment techniques, and referral protocols. A week after training, they conducted screening in the two PHCs.

Consent

The nurse briefed parents/caretakers about the study and obtained consent. Illiterate parents had their signatures witnessed by an impartial observer (a relative of another patient). Children aged ≥12 provided assent by signing the child assent form.

Demographic data and history

Each child had a unique identification number. The OTs recorded demographic data, education, occupation of the mother, socioeconomic status using the modified BG Prasad classification[9] – 2022, preterm history, vitamin A prophylaxis, reason for accessing healthcare, previous eye examination, glasses, eye surgery, and parental consanguinity.

Vision screening

A vision assessment was performed with an E chart at 3 m distance, with glasses, if the child was wearing glasses (presenting visual acuity). Children not able to understand the E chart/younger children were assessed for their ability to fix and follow a small toy. A red reflex test was performed with the direct ophthalmoscope followed by a basic torch light examination to look for the presence of microphthalmos, buphthalmos, drooping eyelid, squint, nystagmus, redness, discharge, watering, corneal opacity, cataract, abnormal pupil size, coloboma, or other abnormalities.

Criteria for referral

Preterm birth, wearing/advised glasses, prior eye surgery, eye problem in parents/sibling, visual acuity <6/9 in one/both the eyes, cannot fix/follow toy, abnormal/dull red reflex or abnormality on torch light examination. Parents were informed that the treatment would be free of cost.

Examination in the base hospital by the pediatric ophthalmologist

Vision assessment with pediatric chart, dry refraction, Hirschberg's and cover tests, slit lamp examination preceded pupil dilation with 2% homatropine for a dilated refraction and fundus examination. Hypermetropic and astigmatic children were scheduled for PMT; myopic children received glasses on the same day after dilated acceptance. Eye drops and glasses were provided free.

The measures taken to improve the response rate – reminder phone calls, transport arranged from the CHC to the base hospital, and pediatric ophthalmology team visits to CHC on some days.

Definitions in the study

Ocular morbidity (OM)

Eye conditions requiring clinical intervention and follow-up.[10]

Blindness and visual impairment

Presenting visual acuity (PVA) in the better eye for all categories. Blindness: PVA <3/60, severe visual impairment: 3/60 to <6/60, moderate visual impairment: 6/60 to <6/18 and mild visual impairment: 6/18 to < 6/12.[11]

Refractive error

Children >5 years: Myopia: >−0.5 dioptres (D), hyperopia: >+2D, and astigmatism: >0.75D after a cycloplegic refraction.[12]

Children ≤5 years: Myopia: >−2.5DS, hyperopia:>+3.5DS and astigmatism: >1.5D.[13]

Premyopia: Spherical equivalent of >−0.5DS and ≤ +0.75 D, in children aged ≤6 years.[14]

Congenital nasolacrimal duct obstruction (CNLDO)

Failure in the nasolacrimal duct drainage system and presenting as epiphora.[15]

Pediatric cataract

Lens opacity due to any etiology and causing vision <6/9.[16]

Anophthalmos

Complete absence of the globe with intact ocular adnexa.[17]

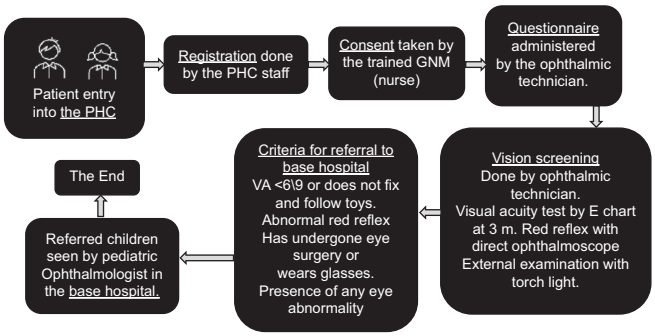

Figure 1: Shows the flow diagram of the methodology of the study

Microphthalmos

A small globe with a corneal diameter <10 mm. Corneal size alone was used to make a diagnosis since an ultrasound measurement of axial length was not possible.[17]

Uveal coloboma

Notch, gap, hole, or fissure in the iris, and/or chorio-retinal layer.[18]

Amblyopia

Visual acuity <6/12 in one or both eyes, due to abnormal binocular interaction and/or pattern vision deprivation with no apparent organic lesion, which could be corrected by appropriate treatment.[19]

Strabismus

Misaligned visual axis causing an outward, inward, upward, or downward deviation of either eye.

Retinal degenerations or dystrophies

Inherited photoreceptor and/or retinal pigment epithelial dysfunction.

Ptosis

Drooping upper eyelid with narrowing of the vertical palpebral fissure.[20]

Unmet need

Unmet need is defined as the portion of a population that has OM but has not received appropriate care, intervention, or treatment. Unmet need = (number of children with ocular morbidity) – (number of children treated for that condition).

Socioeconomic classification ***(BG Prasad classification)***:[9]

Upper (≥8397 INR/head), upper-middle (4156–8396), middle (2460–4155), lower-middle (1272–2456), Lower (<1272).

Data management and statistical analysis

Data imported from Excel to STATA17. Baseline characteristics are summarized using means and standard deviations for normally distributed quantitative data (as assessed by inspection of histograms), medians and interquartile ranges for non-normally distributed data, and numbers/frequencies for categorical data. Prevalence of OM and BVI were calculated using percentages. Baseline characteristics were compared between referred individuals who attended the examination versus non-attendees and between those reporting eye problems versus those who did not, using appropriate statistical tests (Chi-square test, *t*-test, Fisher's exact test).

Results

Nine-hundred-and-sixty-five children were screened. Four had missing data. Of 961, 125 (13%) were referred to the base hospital; 72/125 (57.6%) attended evaluation.

Baseline characteristics and demographic profile of patients attending the health centers: [Table 1]

The mean (SD) age was 6.87 (4.97) years; 53% were males. Most mothers (62.26%) completed 8–12th standard were housewives (48.06%) or non-agricultural laborers (43.34%). The middle class was 68%; 65% traveled ≤5 km to the health center. About 49% of the children were born out of consanguineous marriages.

Only 31 children (3.23%) sought eyecare at the PHC; 21 were referred, but only 8 (38%) followed up. Of the 72 children seen at the base hospital, 35 (48.61%) reported eye problems, yet only 5/35 (14.29%) had prior eye exams.

Comparison of those children that came for evaluation vs those that did not:

Seventy-two out of 125 (57.6%) visited the base hospital. Due to 42.4% dropout, a comparison between attendees and non-attendees was made to establish whether there was any association between attendance and each of the demographic factors (age, distance traveled, gender, maternal education and occupation, socioeconomic status); attendees were slightly older (7.4 vs 6 years) which was not statistically significant in this data set ($P = 0.07$). Similarly, although the mean distance of attendees was 5 km and that of non-attendees was 4 km, this was not statistically significant ($P = 0.1$). No significant differences were observed in other parameters (gender, maternal education and occupation, socioeconomic status).

Comparison between children reporting eye problems versus those who did not, among those evaluated at the base hospital

Strong evidence of association was found only for age. Older children (8.34 vs 3.34, $P = 0.001$, student *t*-test) reported more eye problems. No significant differences were observed in other parameters.

Visual impairment and blindness: [Table 2]

Most children (83.33%) had UCVA/PVA of 6/6–6/12 in the better eye, improving to 94.74% after refraction.

Ocular morbidity: Table 3

The most common OM was uncorrected refractive errors (URE) (52.77%). Premyopia (hyperopia ≤+0.75DS) was found in about 11% of children ≤6 years.

Management

Among the 72, 39 (54.17%) required treatment; 19 (26.39%) required glasses. Of these, 15 (20.84%) with refractive errors ≤3D could have been treated by the PMOA at the PHC. Twelve (16.67%) needed medical treatment, and 15 (20.83%) required counseling, for CNLDO, headaches, and premyopia. Nine of the 39, severe allergic conjunctivitis (four), refractive errors >3D (four) (with coloboma, pseudophakia and amblyopia,) and intermittent exotropia (one) required the required secondary/tertiary care.

Visual impairment, blindness and social factors: [Table 4]

Although the sub-sample size ($n = 36$) is too small to give definitive results, trends suggest an association between visual impairment and socioeconomic status. Children of non-agricultural laborer mothers had 29.41% VI, while those of housewives and formal sector workers had 7.14%. VI was

Table 1: Baseline characteristics and demographic profile of patients attending the health centers

Parameters	Number/ percentage
Age (*n*=965)	
Mean age (SD)	6.87 (4.97)
0–5 years of age	456 (47.25%)
6–10	211 (21.87%)
11–17	298 (30.88%)
Gender (*n*=965)	
Male	510 (52.85%)
Female	455 (47.15%)
Education of the mother (*n*=954)*	
Illiterate	10 (1.05%)
No formal education	55 (5.77%)
<8 years	229 (24%)
8 to 12 years	594 (62.26%)
>12 years	66 (6.92%)
Occupation of the mother (*n*=953)*	
Housewife	458 (48.06%)
Agriculture	29 (3.04%)
Non-agricultural labor	413 (43.34%)
Formal sector (teacher, bank, etc.)	42 (4.41%)
Petty trade	11 (1.15%)
Socioeconomic status of the family (B G Prasad classification) (*n*=945)*	
Upper class – ≥8397 inr/head	2 (0.21%)
Upper-middle-class – 4156–8396	216 (22.86%)
Middle class – 2460–4155	643 (68.04%)
Lower-middle class – 1272–2456	76 (8.04%)
Lower class – <1272	8 (0.85%)
Distance from home to health center (km) (*n*=962)*	
Range	0.5-65.9 km
Median	3.26 km
≤5 km	626 (65.07%)
>5 to 10 km	266 (27.65%)
>10 to 15 km	54 (5.61%)
>15 to 20 km	7 (0.73%)
>20 km	9 (0.94%)

**n* is variable because a few data are missing in some children. The proportions are the percentages of the total whose data is available

mainly observed in the middle and lower-middle classes, with no cases in the upper-middle class.

Discussion

Baseline characteristics, demographic profile, and socioeconomic status

Our study stands out as it is the first in India to investigate OM in children at primary care public health facilities, which are frequently utilized by economically disadvantaged populations.[21] This cohort shows a predominance of middle-class families (68%), with low representation of the lower (0.85%) and upper class (0.21%). Pavagada reports that 10–16% population is below the poverty line.[22] While the upper class tends to access private healthcare, constraints may limit the lower class's access to care. Further research through a population-based study is necessary to explore this issue in depth.

The gender distribution was nearly equal in this study (M:F = 53:47), contrasting with tertiary eyecare centers where males dominate. Khanna RC *et al*.,[23] and Manna S *et al*.[24] feel that females may benefit more from primary care services due to their ability to leave household duties for check-ups, especially when it is ≤5 km. Studies in tertiary eyecare centers on pediatric cataracts in southern[25] and Eastern India[26] reveal male dominance (66:34 and 58:42, respectively) likely due to financial constraints and decision-making dynamics favoring boys.

Despite reminder calls, transport assistance, and free services, only 57.6% (72/125) attended evaluation at the base hospital. No difference was observed in gender, maternal education, occupation, or socioeconomic status between attendees and non-attendees. A study conducted in Pavagada[27] in 2009 had a response rate of 42%. In our study, most parents were upset by the reminder phone calls, since they felt that their child did not have any eye problem, similar to a previous study in this region where parental inability to detect problems was a major barrier to pediatric eye care access.[28]

Only 31 (3.23%) children came to the health center seeking eyecare; but 35/72 (48.61%) children who had come to the base hospital said that they had an eye problem. It appears that children with eye problems do not seek care at PHCs/CHCs. In India, PEHC is provided in PHCs (30,000 population) and CHCs (100,000 population) by a PMOA capable of refractions and eye disease screening.[23] In Pavagada (population – 2,50,630), seven PHCs and two CHCs should suffice; the problem here is a lack of manpower and infrastructure. The PMOA visits the PHC weekly and CHC twice weekly, does not have a retinoscope, and relies on trial-and-error for refractions.

Ocular morbidity and vision impairment

Of the 72 seen in the base hospital, 48 (66.67%) had OM. Since there were no significant differences in the demographic and socioeconomic factors between those who came and did not come for evaluation, assuming a similar prevalence among the 53 non-attendees, the estimated OM in the entire cohort (n = 965) is 8.60%. This is higher than the 6.54% prevalence reported in a previous population-based study[29] in this area, but less than another study from Tamil Nadu (10.8%),[30] possibly due to differences in study design and setting. Direct comparisons are challenging since this study looks at the OM in a general health center.

The most common OM was refractive error (6.84%), allergic conjunctivitis (0.73%), infective conjunctivitis (0.73%), and strabismus (0.73%). The most common refractive error was astigmatism followed by myopia and hyperopia. The higher prevalence of astigmatism may be attributed to the younger population in this cohort (30% ≤ 2 years). Astigmatism is more common in younger children.[31] About 1.5% of the children had premyopia indicating the potential to develop myopia as they age. Allergic conjunctivitis was the most common morbidity in a primary vision center in South India.[7] This cohort had an equal number of children with infective and allergic conjunctivitis, which could be because infective conjunctivitis is more common during the monsoons. The prevalence of strabismus in this study falls within the range reported by other studies in South India (0.33–10.8%).[7,10,32] Previous studies[27,29] from this area have shown a prevalence of 1 to 0.82% of Bitot's spots; another study from

Table 2: The number of children with BVI disaggregated by gender and age group

UCVA/Presenting visual acuity in the better eye (*n*=36)*							
WHO vision category	0–5 years	6–10 years	11–17 years	Total		Grand total	Cause of loss of vision
				Male	Female		
6/6–6/12 (Normal)	3	8	19	15	15	30** (83.33%)	
<6/12–6/18 (mild)	0	1	3	3	1	4 (11.11%)	Refractive errors
<6/18–6/60 (moderate)	0	0	1	0	1	1 (2.78%)	Refractive errors
<6/60–3/60 (severe)	0	0	0	0	0	0 (0%)	
<3/60 to PL (Blind)	0	0	1	1	0	1 (2.78%)	Refractive errors
No PL (Blind)	0	0	0	0	0	0 (0%)	
Total						36	
Best corrected visual acuity in the better eye (*n*=19)†							
WHO vision category	0–5 years	6–10 years	11–17 years	Total		Grand total	Cause of loss of vision
				Male	Female		
6/6–6/12 (Normal)	0	5	13	8	10	18 (94.74%)	
<6/12–6/18 (mild)	0	0	0	0	0	0	
<6/18–6/60 (moderate)	0	0	1	1	0	1 (5.26%)	Uveal coloboma
<6/60–3/60 (severe)	0	0	0	0	0	0	
<3/60 to PL (Blind)	0	0	0	0	0	0	
No PL (Blind)	0	0	0	0	0	0	
Total						19	

*Out of the 72 children seen in the base hospital, visual acuity could be assessed using acuity charts for 36 children only; the rest were too young or not cooperative. †Out of the 30 children in the category of 6/6-6\12 UCVA, 14 children had 6\6 in OU and were not refracted. Three children had 6/9 vision in OU but were <5 years of age, and hence, visual acuity was normal for age. A total of 13 were refracted, out of which 12 were prescribed glasses (1 had insignificant refractive error for age). Six children in the vision category <6\12 to PL were also refracted. So, 19 were refracted

central India showed a higher prevalence of 1.4%.[33] No Bitot's spots were observed in this cohort, and corneal opacity (0.31%) was not associated with vitamin A deficiency. Also, only 0.74% of eligible children did not take vitamin A prophylaxis. The prevalence of uveal coloboma was 0.21%. Another recent study[7] in South India showed a prevalence of 0.009%, and previous studies[27,29] conducted in the same area showed a prevalence of 0.18%. The high rate of potentially genetic disorders in this area could be because of the high rate of consanguinity found in this study (49%). We did not see any case of cataractst. The prevalence of pseudophakia and aphakia was 0.21% each. Another study from South India showed a prevalence of 0.04%,[7] and the previous population-based studies[27,29] showed a prevalence of 0.06%.

In this study, URE were the main cause of BVI. A systematic review by Wadhwani M *et al*.[34] says that in Indian children, URE and globe anomalies are the causes of VI and blindness, respectively. Since this is a health center-based study and not representative of the population, the findings may be different.

The unmet need (those children that need either optical, medical, or counseling but did not get it) in the area was 54.17%, with 76.92% of the required treatment potentially manageable at the PHC level by the PMOA and medical officer. This highlights the importance of strengthening PEHC to reduce the burden on secondary/tertiary care, as demonstrated by Kalita *et al*.[7]

Visual impairment and social factors

Although the sub-sample size is limited, and statistical testing does not give us a significant value, the study suggests a relationship between vision impairment and lower maternal education, non-agricultural labor, and lower socioeconomic status. It is well documented[35] that maternal education helps take pro-health measures and thus can help in decreasing vision impairment. Non-agricultural laborers do not have a permanent job, usually work in building and road construction sites, and take their children to work, thus subjecting the children to the hazards of their occupation (dust, grime, injury). These people also tend to be in the lower socioeconomic strata of the society.

Limitations

This cohort does not represent the population of Pavagada, since data on the socioeconomic status shows that the lower class has been left out. The dropout rate was 42% (72/125). Of the 72, the visual impairment could be calculated for 36 children only, since the rest were too young to cooperate for acuity charts. Hence, the sub-sample analysis of VI with social factors cannot give a definite result.

Recommendations

A population-based study to assess OM and healthcare access among the lower class is recommended. Enhancing PHC infrastructure and manpower by training PMOAs to conduct pediatric refractions and identify sight-threatening conditions is essential. Partnerships between NGO hospitals and PHCs can provide secondary-level eye care, with referrals to regional ophthalmology institutes for complex cases. School screening programs should offer onsite refractive services and glasses to reduce school absenteeism. Awareness of eye diseases can be increased through posters at public sites and educational videos during screenings. Red reflex testing should be added to immunization schedules or mother-child cards for periodic assessment.

Table 3: The diagnosis of children seen in the base hospital, disaggregated by age and gender

Diagnosis	0–5 years	6–10 years	11–17 years	Total		Number and % out of *n*=72	Number out of *n*=965	Prevalence in the cohort of 965 in % with CI[§]
				Male	Female			
Normal	18	2	4	12	12	24 (33.33%)	882	91.40 (89.4, 93.09)
With OM	23	7	19	25	23	48 (66.67%)	83	8.60 (6.91,10.55)
Hypermetropia*	0	1†	4	2	3	5 (6.94%)	9	0.93 (0.43, 1.76)
Astigmatism*	12‡	3	12	16	11	27 (37.5%)	47	4.87 (3.6, 6.42)
Myopia*	0	0	6	3	3	6 (8.33%)	10	1.04 (0.5, 1.9)
Refractive errors	12	4	22	21	17	38 (52.78%)	66	6.84 (5.33, 8.62
Premyopia	7	1	0	6	2	8 (11.11%)	14	1.45 (0.8, 2.42)
Congenital nasolacrimal duct obstruction	3	0	0	1	2	3 (4.17%)	5	0.52 (0.17, 1.2)
Allergic conjunctivitis	0	2	2	2	2	4 (5.56%)	7	0.73 (0.29, 1.49)
Infective conjunctivitis	2	0	2	4	0	4 (5.56%)	7	0.73 (0.29, 1.49)
Conjunctival nevus	1	0	0	0	1	1 (1.39%)	2	0.21 (0.03, 0.75)
Conjunctival disorders	3	2	4	6	3	9 (12.5%)	16	1.66 (0.95, 2.68)
Corneal opacity	0	0	2	2	0	2 (2.78%)	3	0.31 (0.06, 0.91)
microcornea	0	0	1	1	0	1 (1.39%)	2	0.21 (0.03, 0.75)
Corneal disorders	0	0	3	3	0	3 (4.17%)	5	0.52 (0.17, 1.2)
Uveal coloboma	0	0	1	1	0	1 (1.39%)	2	0.21 (0.03, 0.75)
pseudophakia	0	0	1	1	0	1 (1.39%)	2	0.21 (0.03, 0.75)
aphakia	0	0	1	1	0	1 (1.39%)	2	0.21 (0.03, 0.75)
Lens disorders	0	0	2	2	0	2 (2.78%)	3	0.31 (0.06, 0.91)
strabismus	1 (IDS)[‖]	1†	2	2	2	4 (5.56%)	7	0.73 (0.29, 1.49)
pseudostrabismus	1	0	0	1	0	1 (1.39%)	2	0.21 (0.03, 0.75)
amblyopia	0	1†	2	1	2	3 (4.17%)	5	0.52 (0.17, 1.2)

*Refractive errors were diagnosed only if they were significant and needed treatment. †One child had esotropia in OD with amblyopia with hypermetropia in OU, most likely refractive accommodative esotropia. ‡11 were 3 years of age and glasses were not given. One 3-year-old had 3.75 astig in OD only and was given glasses. §The prevalence in the last column was calculated assuming that the prevalence would be the same for the 53 that did not come for evaluation. ‖intermittent divergent squint

Table 4: Visual impairment and blindness based on social factors

Social factors	Total number in each row	6/6-6/12 Normal (*n*=30)	With any impairment (it is the sum of mild, moderate, severe, and blind categories)
Education of the mother*			
Illiterate	0	0	0
Literate, but no formal education	4	3 (75%)	1 (25%)
<7 std	8	7 (87.5%)	1 (12.5%)
8–12th std	22	19 (86.36%)	3 (13.64%)
>12th	0	0	0
Occupation of the mother			
Housewife	14	13 (92.86%)	1 (7.14%)
Agriculture	1	1 (100%)	0 (0%)
Non-agricultural labor	17	12 (70.59%)	5 (29.41%)
Formal sector (teacher, bank etc.)	3	3 (100%)	0 (0%)
Petty trade	1	1 (100%)	0 (0%)
Socioeconomic status of the family			
Upper class – ≥8397 inr/head	0	0	0
Upper-middle-class – 4156–8396	7	7 (100%)	0 (0%)
Middle class – 2460–4155	23	18 (78.26%)	5 (21.74%)
Lower-middle class – 1272–2456	6	5 (83.33%)	1 (16.67%)
Lower class – <1272	0	0	

The percentages are row percentages. *In this category, the data of two mothers are missing

Conclusions

There is an unmet need for PEHC in Pavagada. UREs were the most common OM. This can be taken care of by the PMOAs, by improving manpower, infrastructure, and training. An empowered PEHC can reduce the load on secondary/tertiary care centers. Parental awareness campaigns emphasizing early treatment seeking are essential.

Acknowledgments

Dr Sujatha Rathod, then Director, Directorate of Medical Education, Govt of Karnataka for posting senior students of Diploma in ophthalmic technology (DOT), so as to help us in the screening activities pertaining to the project.

My sincere thanks to the medical officers, Dr Redappa, Dr Kirankumar, and Dr Lingaraju working in the health centers for the support and cooperation rendered. I am also grateful to the staff of the health centers for their invaluable support.

My sincere heartfelt thanks to the Chairman of Shree Sharadadevi Eye Hospital (SSEDH), Swami Japananda, for helping me get permission from the state government and rendering unconditional support to conduct my research in SSDEH.

Ms Aarya Shekar, BSc optometry, who did the refractions of the children that were examined in SSDEH, Pavagada.

Dr K Nagaraj, Prof, Asian College of Journalism, for helping me in interpreting the data on social factors.

Financial support and sponsorship: This project was jointly funded by

1. Commonwealth shared scholarship, UK.
2. International Centre for Eye Health Reserves, London School of Hygiene and Tropical Medicine, London, UK.
3. Tijssen Foundation, UK.

Conflicts of interest: There are no conflicts of interest.

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