

ORIGINAL RESEARCH

A retrospective Study to evaluate the causes of visual impairment and blindness among patients applying for disability certificate at tertiary care hospital in Assam

¹Arup Deuri, ²Babi Das, ³Pranjal Bhuyan, ⁴Lani Bhattacharyya, ⁵Laba Bhandary

¹Associate Professor, ²Assistant Professor, ⁴Senior Resident, ⁵Registrar, Department of Ophthalmology, Lakhimpur Medical College, North Lakhimpur, Assam, India;

³Assistant Professor, Department of Physiology, Lakhimpur Medical College, North Lakhimpur, Assam, India

Corresponding Author

Babi Das

Assistant Professor, Department of Ophthalmology, Lakhimpur Medical College, North Lakhimpur, Assam, India

Email: dr.babi.das@gmail.com

Received: 16 December, 2023

Accepted: 18 January, 2024

ABSTRACT

Background: Visual impairment and blindness is one of the leading causes of disability worldwide and have profound socio economic impact. Though, visual impairment can lead to permanent disability, some are preventable or curable if detected in an early stage. Knowledge of various causes of visual impairment through frequent regional evaluation can be helpful in planning and management. **Aim:** To find out the causes of visual impairment and blindness among patients applying for disability certificate in tertiary care hospital in Assam. **Material and Method:** A Hospital based retrospective study to analysed the causes of visual impairment blindness among applicants for visual disability certificate a period of one year. The degree of visual impairment was estimated as per the Ministry of Social Justice and Empowerment, Govt. of India Guidelines. **Results:** Out of 186 applicants 146 were accepted for visual handicap certificate. Out of which 88 (60.27%) were male and 58 (39.72%) were female. Most common age group of was 20-40 years. In this study, 36.30% had some congenital anomaly and the rest 63.70% had acquired disorders. Among the congenital disorders Congenital microphthalmos and Anophthalmus was found to be most common, followed by coloboma of eye, while Diabetic retinopathy and as complication was the most common Acquired condition followed by refractive error and amblyopia. **Conclusion:** Regional data regarding leading causes of visual impairment is helpful not only im institutional level for better management of cases, but also for planning and implementation of various government plans and It also identifies unique need of a particular region.

Keywords: Congenital, Prevalence, diabetic retinopathy, Microphthalmos, Anophthalmos

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution- Non Commercial- Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non- commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

Visual impairment is one of the leading causes of disability. As per the report published in Lancet in 2015, visual impairment was found to be the 3rd leading cause of disability after anemia and hearing loss worldwide.[1] Visual impairment and blindness is a major public health problem in developing countries like India.[2] It affects not only the quality of life of the individual, but also the family and society in terms of economy and development. There are many acquired and congenital ocular diseases that lead to partial or complete loss of vision, leading to permanent visual impairment. Therefore, it is utmost important to identify the underlying factors for prevention,

treatment, management and rehabilitation of the problem.[2] Globally, at least 2.2 billion people have a near or distance vision impairment. Among them, at least 1 billion or almost half of these cases have impairment of vision that could have been prevented or their problem yet to be addressed.[3] In India, 62 million people were considered visually impaired. Out of these 62 million, 54 million were found in the category of low vision and 8 million were blind.[4] In this retrospective study we have analysed various causes of visual impairment and blindness among the applicants for visual disability certificate in a tertiary care hospital of Assam. This type of Evaluation on blindness and visual impairment are needed to

identify various leading causes of visual impairment in a specific region as the prevalence may be different for different region and thus it helps in planning and management. In India highest number of visually disabled people are from Uttar Pradesh contributing 15.5%. Assam has a share of 1.79% of visually disabled people in the country.[5] Under the ongoing National Program for Control of Blindness and Visual Impairment (NPCB&VI), India has implemented a series of effective measures to combat the situation, and it has resulted in a significant decline in prevalence of blindness over the past few decades [6].

In the current study, we use WHO definition of blindness published in the 10th revision of the WHO International Statistical Classification of Diseases, Injuries and Causes of Death. 'Low vision' is defined as visual acuity of less than 6/18 but equal to or better than 3/60, or a corresponding visual field loss to less than 20°, in the better eye with the best possible correction. 'Blindness' is defined as visual acuity of less than 3/60, or a corresponding visual field loss to less than 10°, in the better eye with the best possible correction. 'Visual impairment' includes both low vision and blindness.[7]

MATERIALS AND METHODS:

The study design is hospital-based retrospective study. Medical record of all the patients who presented to the Disability Clinic for disability certificate for visual impairment and blindness to the Ophthalmology department between July 2022 to June 2023 were included. However, no data which may be used to identify the patient directly, like name and address were not included. Individual patient was coded only with Hospital number and departmental Registration number. All applicant's medical record sheets were

examined thoroughly, and final diagnosis was made after excluding avoidable causes of blindness. Their best corrected visual acuity and final diagnosis were confirmed before recommending them to disability certification board of the hospital. We analysed all applications to determine the causes of decreased vision and blindness to find out whether it was preventable and avoidable or not. Those deemed having avoidable condition were given proper treatment and thereafter their best corrected visual acuity were determined. Percentage of visual acuity was given after excluding avoidable and preventable causes of decreased vision at presentation. Diseases such as cataract and correctable refractive errors, posterior capsular opacification, cases of central leucomatous corneal opacity with normal posterior segment etc were excluded. Out of 186 applicants 146 were accepted for disability certificate. In our study, we considered a person to be visually impaired if his eyesight could not be corrected to a "normal level" (Center for Disease Control and Prevention, CDC) All the data were coded and compiled in MS Office Excel 2021 and further relevant statistical analysis were done. In this study, analysis was performed according to Visual Impairment disability categories and percentages of visual impairment proposed by Government of India (category 0 – IVb; 20–100%).[7,8] For visual handicap more than 40% was accepted in this study.

CATEGORIES OF VISUAL DISABILITY

According to "The Gazette of India", Ministry of Social justice and Empowerment Guidelines 2018, evaluation and procedure for certification of various specified disabilities in India has set in the following categories:[7,8]

Better eye Best Corrected	Worse eye Best corrected	Percent Impairment	Disabilitycategory
6/6 to 6/18	6/6 to 6/18	0%	0
	6/24 to 6/60	10%	0
	Less than 6/60 to 3/60	20%	I
	Less than 3/60 to NoLight Perception	30%	II (Oneeyed person)
6/24 to 6/60Or Visual field less than 40 up to 20 degree around centre of fixation or hemianopia involving macula	6/24 to 6/60	40%	III a (low vision)
	Less than 6/60 to 3/60	50%	III b (low vision)
	Less than 3/60 to No Light Perception	60%	III c (low vision)
Less than 6/60 to 3/60Or Visual field less than 20 up to 20 degree around centre of fixation	Less than 6/60 to 3/60	70%	III d (low vision)
	Less than 3/60 to No Light perception	80%	III e (low vision)
Less than 3/60 to 1/60Or Visual field less than 10 degree around centre of fixation	Less than 3/60 to NoLight Perception	90%	IV a (Blindness)
	Only HMCF Only Light PerceptionNo Light Perception	100%	IV b (Blindness)

RESULT

The total number of applicants were 186, out of which 146 were accepted and 40 applications were rejected as in those patients visual impairments were due to treatable cause and after treatment their vision improved. In the present study, out of these 146

patients male were 88 (60.27%), and females were 58 (39.72%). (Figure 1). In Figure 2 the number and percentage of congenital and acquired conditions are shown which is 53 (36.30%) and 93 (63.60%) respectively.

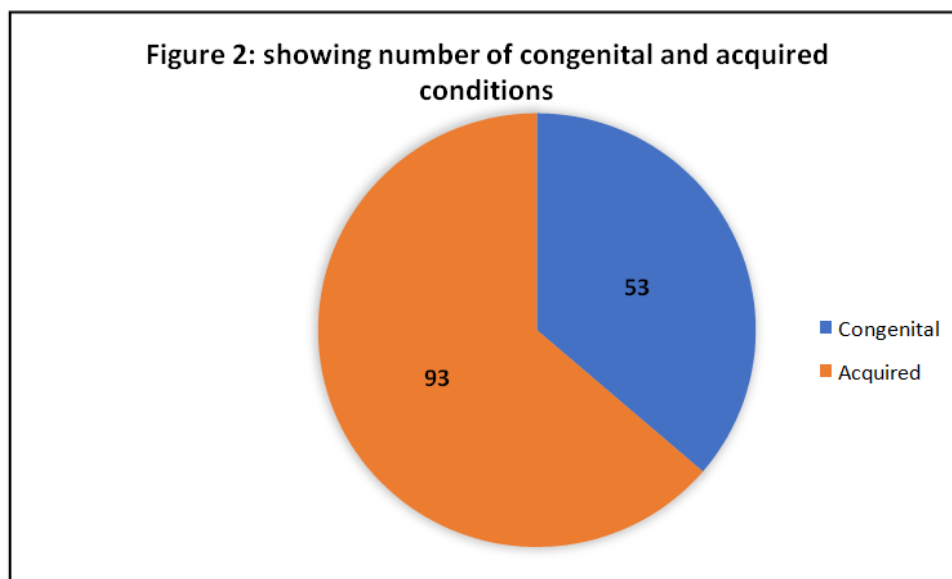
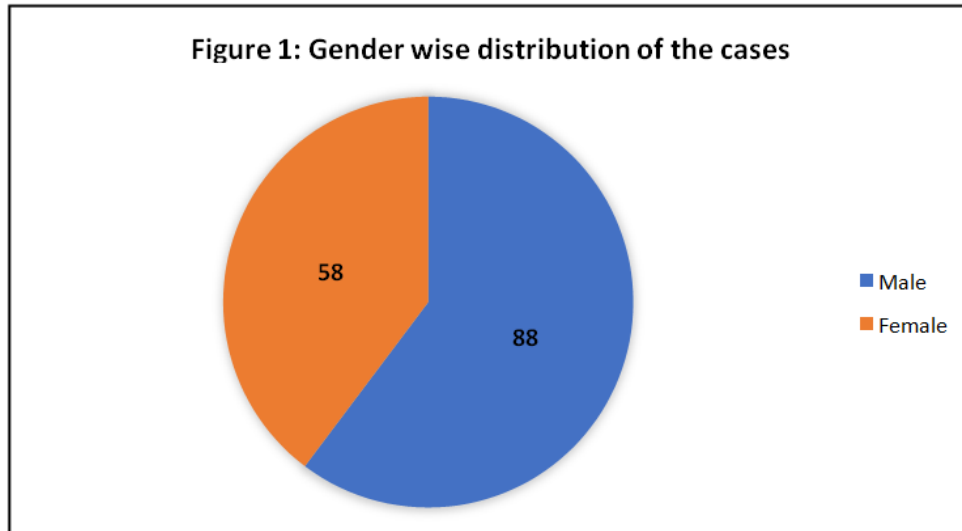
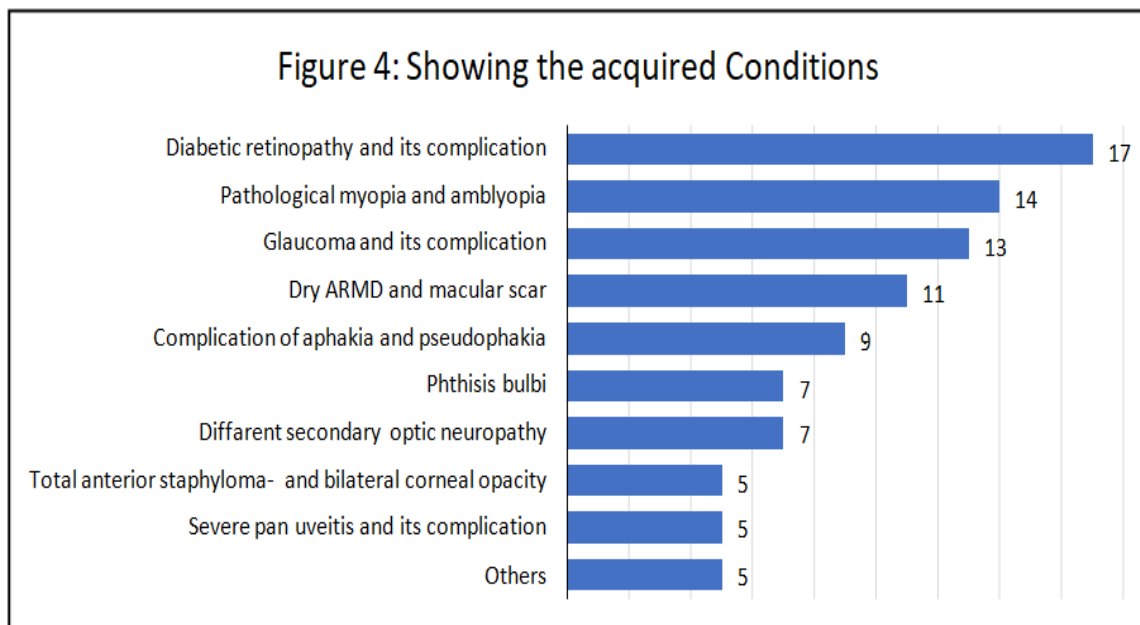
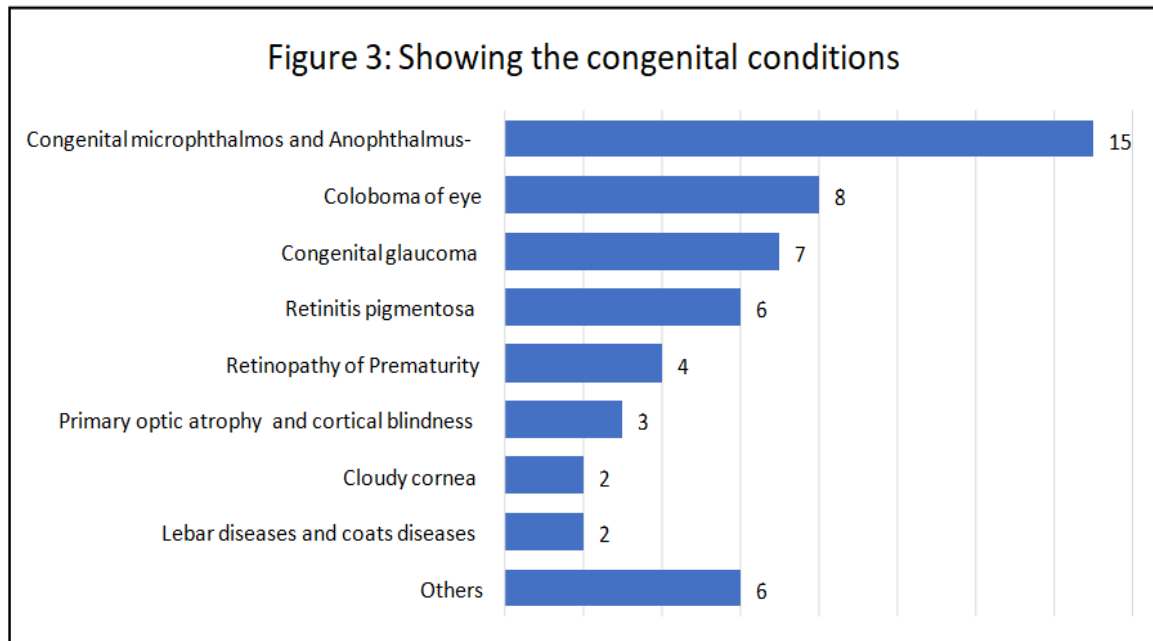


Table 2: Shows age groupwise distribution of cases.

Age Group	Total Cases		Congenital		Acquired	
	No.	Percentage of Total cases(146)	No.	Percentage of Total cases(146)	No.	Percentage of Total cases(146)
0 - 10	17	11.64%	13	8.90%	4	2.74%
11 - 20	14	9.59%	7	4.79%	7	4.79%
21 - 30	34	23.29%	18	12.33%	16	10.96%
31 - 40	37	25.34%	10	6.85%	27	18.49%
41 - 50	22	15.07%	3	2.05%	19	13.01%
51 - 60	15	10.27%	2	1.37%	13	8.90%
> 60	7	4.79%	0	0.00%	7	4.79%
Total	146	100.00%	53	36.30%	93	63.70%

The most common age group was between 31-40 (25.34%) followed by the age group of 21-30 (23.29%) and then age group 41-50 (15.07%) (Table 2).



Among the congenital disorders ‘*Congenital microphthalmos and Anophthalmus*’ was found to be most common, followed by coloboma of eye (Figure 3), while ‘*Diabetic retinopathy and its complication*’ was the most common Acquired condition followed by pathological Myopia and amblyopia (Figure 4).

DISCUSSION

Current global burden of visual impairment is 2.2 billion, out of which about half of them are preventable conditions which are already addressed or yet to be addressed. [3] Availability of healthcare facility, socio-economic status, prevalence of ocular diseases, public awareness also contributed to such type of visual impairment. It was found that preventable blindness is more in the developing countries, even variations may exist in the same

country.

In our study out of 186 applications 146 were accepted and 40 applications were rejected. Disability certificate for visual impairment and blindness more than 40% offers various benefits to the recipients. These certificates help them to get reservation in government jobs, travel concessions in govt transport, income tax benefits, and disability allowances under various government schemes, reservation in higher education etc. [9,10] These may be the contributing factors for more male applicants found in different studies. [11,12] In our study also 60.27% were male and 39.73% were female. Similar findings also found by Patil et al, and Ghose et al where male percentage were more. [10,11]

Patients in the age group of 20-40 years were significantly large in number as compared to other age

groups. This also suggests that the driving force behind attending any board for the disability certification was more among the age group comprising of students and job seekers as they can avail reservation on this basis. To handle this problem school eye screening program and free spectacle distributions under national control of blindness is one of the best possible options. This is very much helpful in early detection and prevention of progress of visual impairment in preventable conditions. In the study conducted by Ghosh S et al, in 2008, the most common age group was also between 11- 20 years (27.74%). [12] Whereas, Anita Ambastha et al found 15-45 years to be the most common age groups in their study. [13]

In this study, 36.30% had some congenital anomaly and the rest 63.70% had acquired disorders. Acquired visual disability is more common than congenital anomaly but most of these disabilities is preventable. Similar type of finding also mentioned by Siddegowda S et al in their publication in 2016. [14] Owing to lack of adequate treatment or lack of proper management at an early stage some conditions progressed to irreversible damage to their eyes. Different govt scheme can help, like "School Health Program" under Ayushman Bharat, Rashtriya Bal Swasthya Karyakram (RBSK) and Rashtriya Kishor Swasthya Karyakram (RKSK). [15] Child Health Screening and Early Intervention Services under NHM envisage to covers 30 identified health conditions including congenital cataract and vision impairment for early detection and free treatment and management. Other than this, the ongoing NPCB&VI program of is one of the most important govt program to control blindness and visual impairment. [6]

Most common congenital disability found in our study was congenital microphthalmos and Anophthalmus, followed by coloboma of eye and congenital glaucoma (Figure 3). In the study conducted by Ghosh S et al, the most frequent condition observed was phthisis bulbi (17.74%) followed by microphthalmos (13.23%). [12]

Among the acquired conditions most common cause was found to be diabetic retinopathy and its complication, followed by pathological myopia and amblyopia and then glaucoma and its complication (Figure 4).

A nationally representative survey '*Blindness and visual impairment and their causes in India*', was done in 2015-19 to find out current status of blindness in India. In this survey cataract was found to be the leading cause of blindness. Untreated cataract was followed by uncorrected refractive errors were the major contributors to visual impairment. [6,16] But in our study we found diabetic retinopathy is most common cause and refractive error is second most common cause. This finding may be because of our study is conducted in tertiary eye hospital where cataract surgery is regularly done here. We forwarded the patients application only after treating preventable

cause of visual impairment. In the population aged 50 years and above, the prevalence of blindness has remarkably declined over past two decades from 5.3% in 2001 to 3.60% in 2007 to 1.99% in 2019. This is because of various ongoing Government schemes to control blindness. Because of huge development in cataract surgery procedure number of aphakia and related complication is reduced significantly.

Diabetic retinopathy is the leading cause of visual impairment and blindness in this study. Better health care provisions in the recent years have increased the life expectancy and hence the proportion of ageing population in the country. Age related complication also increased. Prevalence of diabetes gradually increased among all countries including in India. A survey on diabetic retinopathy was also conducted in twenty-one districts of India, in which the prevalence of diabetic retinopathy among persons with diabetes was 16.9%, prevalence of severe sight threatening diabetic retinopathy was 3.6%, and that of mild retinopathy was 11.8%. [6] While in another study they found patients above 65 years of age, diabetic retinopathy was the most common cause of visual impairment and blindness/handicap. [13]

Second most common cause of acquired visual impairment in our study was refractive error. Which is same with national data of India. [6] Most of acquired causes like Diabetic retinopathy, refractive error, glaucoma, complicated cataract, complication of cataract surgery etc are preventable. Early detection and treatment can prevent these types of visual handicap.

CONCLUSION

Visual disability has serious consequences for the individual through the life and Visual impairment and blindness forms an important drawback in the socio-economic development of individual as well as the society and the country at large. In a developing country like India, a large proportion of visual impairment and blindness are avoidable. Once a person became blind due to irreversible damage to the eye from causes like diabetic retinopathy, glaucoma, trauma, etc. it cannot be reversed and therefore public health action demands early identification of individuals before considerable visual impairment has occurred Collecting information related to the causes of blindness is important for the health planners to put strategies to decrease the prevalence of avoidable blindness and for monitoring their ongoing govt scheme. It can also provide an insight into the overall trends in disease profile and medical service delivery of that region.

BIBLIOGRAPHY

1. Hay SI, Jayaraman SP, Truelsen T, Sorensen RJD, Millea A, Giussani G, Beghi E. Disease GBD, Injury I, Prevalence C. Global, regional, and national incidence, prevalence, and years lived with disability for 310 diseases and injuries, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*.

- 2016;388(10053):1545-602.
2. Robi T, Subhajt P, K.B. S. Study of the Causes of Blindness amongst the Patients in Manipur State: A Retrospective Analytical Study. *Annals of International medical and Dental Research*. 2016 Oct 17;2.
 3. Vision Impairment and blindness [Internet]. World Health Organization; 2023. Available from: <https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment>
 4. Bourne RRA, Flaxman SR, Braithwaite T, Cicinelli MV, Das A, Jonas JB, et al. Magnitude, temporal trends, and projections of the global prevalence of blindness and distance and near vision impairment: a systematic review and meta-analysis. *Lancet Glob Health*. 2017 Sep;5(9):e888–97.
 5. Verma D, Dash P, Bhaskar S, Pal P, Jain K, Srivastava RP et al. Disabled persons in India a statical profile 2016[internet]. Social Statistics Division, Ministry of Statistics and programme implementation, Government of India. New Delhi; 2017. Available from:https://www.mospi.gov.in/sites/default/files/publication_reports/Disabled_persons_in_India_2016.pdf.
 6. Vashist P, Senjam SS, Gupta V, Gupta N, Shamanna BR, Wadhvani M, et al. Blindness and visual impairment and their causes in India: Results of a nationally representative survey. *PLoS One*. 2022;17(7):e0271736.
 7. ICD-10: international statistical classification of diseases and related health problems. 10th revision, 2nd ed. Geneva: World Health Organization, 2010. Available from: https://icd.who.int/browse10/Content/statichtml/ICD10Volume2_en_2010.pdf
 8. Ministry of Social Justice and Empowerment. Guidelines for evaluation of various disabilities and procedure for certification. Notification dated 4th January 2018. The Gazette of India extraordinary. Part 1. Section 1. No 154.
 9. Kumar R. Disability Assessment and Certification Guidelines and Explanations, based on Gazette Notification (Committee under chairmanship of DGHS, GOI) issued by Ministry of Social Justice and Empowerment, GOI, Regd No. DL33004/99 (Extraordinary) Part II, Sec. 2001 Jun;1.
 10. Ministry of Social Justice and Empowerment. Guidelines for evaluation of various disabilities and procedure for certification. Notification dated 1st June, 2001. The Gazette of India extraordinary. Part 1. Section 1. No 154.
 11. Patil B, Pujar C, Manasa CN, Mallikarjun CS. Study of causes of visual handicap amongst patients attending outpatient department for visual handicap certification in a medical college of Bagalkot district of Karnataka, India. *Medica Innovatica*. 2015 Dec;4(2):13-6.
 12. Ghosh S, Mukhopadhyay S, Sarkar K, Bandyopadhyay M, Maji D, Bhaduri G. Evaluation of registered visually disabled individuals in a district of west bengal, India. *Indian J Community Med*. 2008 Jul;33(3):168–71.
 13. Ambastha A, Kusumesh R, Sinha S, Sinha BP, Bhasker G. Causes of visual impairment in applications for blindness certificates in a tertiary center of Bihar and its role in health planning. *Indian J Ophthalmol*. 2019 Feb;67(2):204–8.
 14. Srinivas S, Pradeep A, Manjula T, Prathibha S. A study to evaluate the cause of blindness/ low vision among certified visually disabled individuals in Mandya district of Karnataka. *Indian Journal of Clinical and Experimental Ophthalmology*. 2021 Feb 9;2021:2862.
 15. Swarup A, Shekhar VS, Bhaskar GV, Jolly M, Yadav S, Shukla A, Bakshi S et. al. Operational Guidelines on School Health Programme under Ayushman Bharat. New Delhi: Ministry of Health & Family Welfare and Ministry of Human Resource & Development, Government of India; 2018, 40p. Available from: https://nhm.gov.in/New_Updates_2018/NHM_Components/RMNCHA/AH/guidelines/Operational_guidelines_on_School_Health_Programme_under_Ayushman_Bharat.pdf
 16. Kumar A, Vashist P. Indian community eye care in 2020: Achievements and challenges. *Indian J Ophthalmol*. 2020 Feb;68(2):291–3.