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Original Article

A STUDY TO EVALUATE THE TYPE AND CAUSE OF BLINDNESS/LOW VISION IN APPLICATIONS FOR BLINDNESS CERTIFICATE PRESENTING IN CHAMBA DISTRICT OF HIMACHAL PRADESH

SMRITI SHARMA*, SHALOO NEGI, ADITYA KASHYAP

Pandit Jawahar Lal Nehru Govt Medical College Chamba, Himachal Pradesh, India
***Corresponding author: Smriti Sharma; *Email: simi.tauraus30@gmail.com**

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ABSTRACT

Objective: This study aims to assess the prevalence, causes, and socio-economic impacts of visual impairment in the Chamba District of Himachal Pradesh, India. It seeks to identify the major factors contributing to visual disability and the role of literacy and employment status in influencing the lives of the visually impaired.

Methods: A cross-sectional, hospital-based study was conducted over a period of one year, enrolling patients from the outpatient department of ophthalmology who were applying for visual disability certification. The study utilized a randomized sampling method and a semi-structured interview along with an examination form for data collection. Ethical approval was obtained, and the study adhered to ICMR and Helsinki Declaration guidelines. Participants underwent comprehensive ophthalmic evaluations, and data were analyzed using SPSS version 17.0.

Results: Among the 270 participants evaluated, a higher prevalence of visual impairment was observed in males (n=149) compared to females (n=121), particularly within the age group of 21-40 y. The leading causes of visual disability included Corneal Opacity (16.25%), Retinitis Pigmentosa (15.83%), and Congenital Malformation (14.17%). Furthermore, literacy played a crucial role in employment opportunities, with 75.83% of the literate participants being employed, indicating a significant impact on the socio-economic status.

Conclusion: The study highlights the multifaceted nature of visual impairment in the Chamba District, emphasizing the need for integrated public health strategies to address the identified challenges. Enhancing preventive measures, improving access to healthcare, and supporting rehabilitation services are essential steps towards mitigating the burden of visual impairment.

Keywords: Visual impairment, Blindness, Corneal opacity, Retinitis pigmentosa, Public health, Socio-economic impact, literacy, Employment, India

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INTRODUCTION

The National Blindness and Visual Impairment Survey, conducted between 2015 and 2019, aimed to gather comprehensive data on the current state of blindness and visual impairment across India [1]. This significant effort was orchestrated by the Ministry of Health and Family Welfare under the Government of India's auspices. This survey was particularly critical in the wake of the World Health Organization's Vision 2020: The Right to Sight initiative launched in 1999 in partnership with the International Agency for the Prevention of Blindness (IAPB). The initiative's primary goal was to eradicate avoidable blindness by the year 2020 [2].

In 2013, the World Health Assembly further bolstered global efforts by adopting the Universal Eye Health: A Global Action Plan 2014-2019. This plan set forth an ambitious target: to diminish the prevalence of preventable visual impairment by 25% by 2019, using 2010's baseline fig. as a benchmark. India's response to these global calls to action has been robust, implementing a multitude of interventions through its National Program for Control of Blindness and Visual Impairment (NPCB and VI), aimed at addressing the spectrum of conditions leading to blindness and visual impairment [3].

Historically, the first global estimate of blindness data was published in 1995, relying on population fig. from 1990. These estimates were subsequently adjusted to account for the demographic changes anticipated up to the year 2020. It is now understood that up to 85% of moderate to severe visual impairment and 80% of blindness can be prevented or cured through timely intervention. Leading causes of blindness worldwide include cataracts, uncorrected refractive errors, glaucoma, and age-related macular degeneration, among others [4].

In India, the certification of blindness or partial sight serves as a gateway to accessing various social services for individuals with visual disabilities. Certification is voluntary and requires the approval of a board comprising an ophthalmologist, a physician, and the chairman of the Medical Board. The challenge of defining disability, with the Ministry of Social Justice and Empowerment mandating a minimum of 40% disability for eligibility for benefits, highlights the complexity of addressing the needs of all disabled groups [5, 6].

Despite the acknowledged importance of blindness registers for public health programs and research, India's utilization of this methodology has been limited due to issues with reporting and record-keeping. Studies analyzing blindness certificates to identify causes of blindness and visual handicap have been scarce [7].

This study, focusing on the visually impaired population of Chamba District in Himachal Pradesh, aims to bridge this gap. Through detailed analysis, it seeks to enhance understanding of the prevailing issues, thereby informing and improving the strategies employed by government bodies to treat and prevent visual disabilities [8].

MATERIALS AND METHODS

This investigation is designed as a cross-sectional, hospital-based study focused on assessing visual disability among patients.

Ethical approval and study population

Ethical and protocol review committee approvals were secured prior to the study. Participants were recruited from the outpatient department of ophthalmology, specifically those applying for visual disability certification, over a period of one year.

Sampling method

The selection of participants was randomized to ensure representativeness.

Data collection

A semi-structured interview and examination form, pre-tested for reliability (see Annexure I), were utilized for data collection over the study period of one year. This study was conducted in the ophthalmology department of Pt JLNGMC, Chamba, H. P., following the approval from the institutional ethics committee.

Inclusion and exclusion criteria

Included were patients for whom no further medical treatment or intervention could likely ameliorate their impairment. Excluded were individuals with cataracts or correctable refractive errors, conditions considered avoidable causes of visual impairment.

Procedures

Upon ethical committee approvals, eligible subjects were enrolled from the ophthalmology OPD. Informed consent was obtained from each participant or their guardians. Data on demographic information, medical history, and medication use were collected using the study form. Each participant underwent a thorough examination, including:

- Visual acuity testing
- Full cycloplegic correction for refractive errors
- Fundus examination
- Slit lamp examination of the cornea, anterior chamber, and conjunctiva

Clinical diagnoses were established based on the medical history and examination findings. Additional tests, such as tonometry, fundus photography, ultrasound examinations, automated perimetry, and Optical Coherence Tomography (OCT), were performed as needed. The causes of blindness and the degree of visual disability were determined in accordance with the Visual Impairment Certification Criteria and Gradation issued by The Gazette of India in January 2018.

Data analysis

Data were analyzed using SPSS version 17.0. Descriptive statistics, including means, medians, and proportions, were calculated to summarize the findings.

Ethical considerations

The study adhered to ethical guidelines outlined by the ICMR (1994) and the Helsinki Declaration (revised 2000), ensuring that all participants were informed about the study's aims, methods, potential benefits, and risks. Privacy and confidentiality were paramount, with every effort made to minimize any adverse effects on participants. Written informed consent was obtained from all participants or their guardians before inclusion in the study.

This methodological framework aims to accurately identify the causes of visual disability and inform necessary preventive measures, thereby contributing to the broader efforts of managing visual impairment within the community.

RESULTS

Our analysis of the study population revealed significant insights into the distribution of visual impairment across different demographics, causative factors, and the intersection of disability with literacy and employment status.

Age and gender distribution

The study examined 270 individuals, revealing a higher prevalence of visual impairment among males (n=149) than females (n=121). The age group of 21-40 y displayed the highest number of cases (n=87), with a notable decline observed in individuals over 60 y of age (n=15). The distribution also highlighted a varying degree of disability, with a majority presenting with severe blindness (75% and 100% disability).

Causative factors of disability

The predominant causes of visual impairment included Corneal Opacity (16.25%), Retinitis Pigmentosa (15.83%), and Congenital Malformation (14.17%). lesser prevalent causes were Diabetic Retinopathy (6.25%) and Macular Dystrophy (5.83%). This distribution underscores the diversity of etiological factors contributing to visual impairment within the population.

Literacy and employment status

The relationship between literacy levels and employment status among the visually impaired indicated that 75.83% of the study population were literate, of which 45.42% were employed. Comparatively, among the illiterate individuals, only 13.33% were employed. This disparity suggests that literacy plays a crucial role in employment opportunities for the visually impaired.

Impact of literacy on level of blindness

Further analysis showed a higher occurrence of severe blindness (75% and 100% disability) among the literate (n=164) compared to the illiterate (n=82) group. This observation may reflect the broader societal and economic challenges faced by visually impaired individuals, influencing their education and vocational prospects.

In summary, our study delineates the intricate landscape of visual impairment within the Chamba District, shedding light on the demographic nuances, causative diversity, and the profound influence of literacy on the livelihoods of affected individuals.

Table 1: Distribution of study population on the basis of age, gender, and percentage of disability

Age group	100	75	40	Total	Grand total (%)
	M	F	M	F	M
5 – 20 y	15	9	4	2	6
21 – 40 y	42	15	10	20	10
41 – 60 y	39	21	12	11	2
>60 y	7	6	2	0	0
Total	103	51	28	33	18

Table 2: Distribution of study population based on the cause of disability

Causative factor	M (n = 149)	F (n = 91)	Total (%) (n = 240)
Amblyopia	2	0	2 (0.83)
Congenital Cataract	2	2	4 (1.67)
Congenital Malformation	22	12	34 (14.17)
Corneal Opacity	25	14	39 (16.25)
Diabetic Retinopathy	8	7	15 (6.25)
Glaucoma	15	10	25 (10.42)
Macular Dystrophy	7	7	14 (5.83)
Pathological Myopia	11	8	19 (7.92)
Optic Atrophy	11	10	21 (8.75)
Phthisis bulbi	13	4	17 (7.08)
Retinal Detachment	4	1	5 (2.08)
Retinitis pigmentosa	21	17	38 (15.83)
Staphyloma	4	3	7 (2.92)

Table 3: Distribution of study population based on literacy level and working status

Literacy level	Male (n = 149)	Female (n = 91)	Total (n = 240) (%)
Literate			
Working	52	57	109 (45.42)
Not working	36	24	60 (25.00)
Studying	10	3	13 (5.42)
Subtotal	98	84	182 (75.83)
Illiterate			
Working	20	12	32 (13.33)
Not working	31	25	56 (23.33)
Studying	0	0	0 (0.00)
Subtotal	51	37	88 (36.67)
Total	149	121	270 (100)

Table 4: level of blindness by literacy status

Literacy status	Moderate blindness (40 % disability)	Severe blindness (75 % and 100 % disability)
Literate	18	164
Illiterate	6	82

DISCUSSION

The exploration of visual impairment and blindness within the Chamba District provides critical insights into a broader public health challenge that reflects global and regional patterns. Notably, Resnikoff *et al.* (2004) highlighted the widespread nature of visual impairment globally, identifying key etiological factors that resonate with findings from our study, including the prevalence of corneal opacities and retinal diseases as significant contributors. This global context emphasizes the urgency and relevance of addressing visual impairment as a multifaceted public health issue [9].

Studies conducted across various parts of India, including those by Pooja *et al.* (2021), Ambastha *et al.* (2019), and Joshi (2013), offer a comparative perspective, underscoring the diversity of causes behind visual impairment and the critical role of localized health interventions. For instance, the work by Pooja H V *et al.*, which focused on ocular morbidity in rural settings, and Ambastha *et al.*'s analysis of blindness certificate applications both underline the importance of targeted screenings and healthcare access to mitigate the burden of preventable blindness. Similarly, our findings regarding the demographic distribution of visual impairment, with a notable incidence among the working-age population, echo the patterns observed in these studies, stressing the socioeconomic implications of visual disabilities [10-12].

Robinson *et al.* (1994) and West (2002) have further contributed to understanding the scale and impact of unrecognised and unregistered visual impairment, particularly in the context of the Americas and the Caribbean. These insights into the underreporting of visual impairment highlight the potential for similar challenges within the Indian healthcare system, suggesting that our findings might only represent the tip of the iceberg in terms of the true prevalence and impact of visual disabilities [13].

The study by Patil *et al.* (2015), focusing on causes of visual handicap in Karnataka, India, complements our research by offering insights into regional variations in the causes of visual impairment and the importance of certification for accessing support services. The emphasis on certification aligns with our observations regarding the complexities and variabilities of defining and certifying visual disability in India, pointing to the need for standardized yet flexible approaches to support individuals with visual impairments effectively [14].

In drawing upon these diverse studies, it becomes evident that visual impairment is a multifaceted public health challenge with varying etiologies, demographic impacts, and regional disparities. Our study contributes to this body of knowledge by offering a detailed examination of visual impairment within a specific Indian context, underscoring the importance of comprehensive, culturally sensitive, and region-specific public health strategies [15]. It calls for an integrated approach to health care, encompassing preventive measures, early intervention, education, and rehabilitation services. Addressing these challenges necessitates collaborative efforts from government bodies, healthcare providers, and community organizations, underpinned by a global understanding of visual impairment as elucidated by the referenced studies.

CONCLUSION

Our study illuminates the complex landscape of visual impairment within the Chamba District, offering valuable insights into its prevalence, causative factors, and the socio-economic impacts on the affected population. Echoing global and national findings, our research underscores the necessity of integrated public health strategies that prioritize preventive care, early detection, and comprehensive support systems for individuals with visual disabilities. By fostering collaborative efforts between healthcare providers, policymakers, and community organizations, we can advance towards mitigating the burden of visual impairment, enhancing the quality of life for individuals affected, and moving closer to achieving the global vision of eliminating avoidable blindness.

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AUTHORS CONTRIBUTIONS

All the authors have contributed equally

CONFLICTS OF INTERESTS

Declared none

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