

Original Research Article

A study on challenges in assessing free cataract surgery services in India: a gender perspective

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ABSTRACT

Background: Cataracts are the leading cause of blindness worldwide, accounting for 51% of cases as per World Health Organization (WHO). Despite cataract surgery being cost-effective, accessibility remains a challenge, particularly in low-income settings. Barriers include affordability, geographic constraints, and cultural acceptability. Gender disparities further limit access, as women—who form a larger proportion of visually impaired individuals—are less likely to receive surgery due to social and economic factors. This study examines cataract surgery accessibility through a gender perspective, identifying systemic, financial, and cultural barriers.

Methods: A multicentre, retrospective study was conducted across 15 diverse locations in India, covering urban, semi-urban, and rural regions. Patient records of individuals who underwent free cataract surgeries were analyzed. Data were collected via structured telephonic interviews, including demographics, socioeconomic status, and perceived barriers. A total of 1,361 patients participated (53% female, 47% male). Statistical analyses, including Chi-square tests, assessed gender-based disparities.

Results: Most respondents (60.18%) independently attended eye screening camps, with males (73.57%) being more self-driven than females (48.04%). Family, especially sons and spouses, influenced women's decisions. Mobility challenges, financial dependency, and sociocultural norms limited women's access. While 76.05% were confident about future hospital visits, 14.62% cited transport, financial, or health concerns.

Conclusions: Gender-based barriers in cataract surgery access must be addressed through community outreach, financial support, and culturally sensitive education campaigns. Targeted interventions are essential to ensuring equitable eye care, reducing preventable blindness, and improving women's healthcare access and participation. Future research should focus on region-specific policies promoting gender-inclusive eye care.

Keywords: Cataract surgery, Gender disparities, Accessibility, Healthcare barriers, Blindness in India

INTRODUCTION

Cataracts are a major global public health concern and the leading cause of blindness worldwide, contributing to 51% of all cases of blindness as estimated by the World Health Organization (WHO).¹ Cataracts typically result from the clouding of the eye's natural lens, leading to progressive vision loss if left untreated. This condition disproportionately affects older adults and low-income

populations, where access to timely surgical intervention remains a challenge.² Cataract surgery, a cost-effective and highly successful procedure, offers a solution to reverse blindness and significantly improve quality of life. However, despite the availability of this procedure, accessibility disparities remain, particularly in resource-constrained settings.³ Understanding these disparities is essential to developing interventions that ensure equitable access to sight-restoring services. Accessibility to

healthcare, especially in the context of cataract surgery, involves a multifaceted approach encompassing the availability, affordability, geographic reach, and cultural acceptability of services. Availability refers to the presence of trained ophthalmologists, surgical facilities, and adequate equipment, while affordability highlights the economic challenges individuals face in accessing care, often due to high out-of-pocket costs.⁴ Geographic barriers, including transportation difficulties and distance to health facilities, further complicate access, particularly in rural and underserved areas.⁵ Lastly, cultural acceptability, shaped by societal beliefs and norms, determines the willingness of individuals to seek care. Together, these factors create a complex web of barriers that hinder access to cataract surgery, often affecting marginalized populations the most.⁶

Gender disparities add another dimension to these accessibility challenges, as healthcare systems worldwide are frequently influenced by social and cultural biases. Women, despite comprising a larger proportion of those affected by visual impairment globally, are less likely to access cataract surgery than men.³ This discrepancy is often driven by patriarchal norms that prioritize the healthcare needs of male family members and limit women's autonomy in making health decisions. Financial dependency, limited mobility, and cultural stigmas further exacerbate this inequity. Studies have consistently shown that these disparities are more pronounced in low- and middle-income countries, where systemic barriers and traditional gender roles intersect to create a significant gap in healthcare access.⁷ Investigating cataract surgery from a gender perspective is crucial for promoting equity in healthcare. Addressing gender-specific barriers can have far-reaching implications, not only in restoring sight but also in enhancing the social and economic participation of women. For example, women who regain vision through surgery are better able to contribute to their families and communities, thereby fostering broader societal benefits.⁸ However, while some studies have highlighted these gender-based inequities, a comprehensive understanding of the barriers and facilitators unique to different cultural and socioeconomic contexts is still lacking. This study aims to bridge this gap by exploring the accessibility of cataract surgery services through a gender perspective. It seeks to identify key barriers faced by women, including systemic, financial, and cultural challenges.

METHODS

This study was a multicentre, retrospective investigation. Data were collected from 15 geographically diverse locations in India, encompassing urban, semi-urban, and rural areas. The selected locations included Bangalore (Karnataka), Chennai (Tamil Nadu), Gaya (Bihar), Brahmapur (Odisha), Raygada (Odisha), Itanagar (Arunachal Pradesh), Rishikesh (Uttarakhand), Jaipur (Rajasthan), Ludhiana (Punjab), Kanpur (Uttar Pradesh), Mandvi (Gujarat), Panvel (Maharashtra), Coimbatore (Tamil Nadu), Nashik (Maharashtra), and Guwahati

(Assam) during April 2022 to May 2023. A structured questionnaire was used as the primary data collection tool to gather information. The questionnaire included sections on demographic details, socioeconomic status, perceived challenges in accessing cataract surgery, and decision-making patterns regarding surgery. Participants were identified retrospectively from patient records in the selected locations. The inclusion criteria of the study population comprised patients who underwent free cataract surgeries at participating centres during the specified period and the rest were excluded. An effort was made to ensure balanced representation of male and female respondents to facilitate a comprehensive gender-based analysis. Trained field staff conducted the surveys, adhering to a standardised protocol to maintain uniformity and minimise interviewer bias. The questionnaire was pre-tested on a small group to ensure clarity and relevance, and adjustments were made based on the feedback received.

Informed consent was obtained from all participants before administering the questionnaire. Participants were assured that their responses would remain confidential and were informed about their voluntary participation, with the option to withdraw from the study at any stage.

Data collected from the questionnaires were entered into a secure database and analysed using statistical software. Descriptive statistics were employed to summarise the demographic characteristics and socioeconomic status of the participants. Inferential statistical methods, including chi-square tests, were used to identify and compare gender-specific disparities in access to cataract surgery. A significance threshold of $p < 0.05$ was established for all statistical analyses.

RESULTS

Demographic profile

Total of 1361 patients, with a relatively balanced distribution between male and female patients. Females constitute a slightly higher percentage of the total patient population at 53%, while males account for 47%. The average age was 65.5 ± 9.30 years.

Among the respondents, the majority, comprising 59.81%, are classified as illiterate. Interestingly, there is a notable gender disparity within this category, with 40.34% of males compared to a significantly higher percentage of females, standing at 77.45%. Moving up the education ladder, 23.07% of individuals have received primary schooling, with a higher proportion of males (31.53%) compared to females (15.41%). Similarly, 16.31% have attained secondary schooling, again with a higher representation of males (26.58%) compared to females (7.00%). A smaller percentage, accounting for 0.66%, have reached senior secondary schooling, with marginal representation from both genders. Technical schooling has the lowest participation rate, with only 0.15% of respondents having attended such institutions, all of whom

are male. Overall, the data underscores disparities in educational attainment between genders, with efforts needed to address barriers preventing females from accessing higher levels of education. Among the respondents, the majority, constituting 70.83%, are currently married. Notably, there is a significant gender disparity within this category, with 83.62% of males currently married compared to 59.38% of females. A small proportion, accounting for 0.73%, have never been married, with a higher percentage of females (1.12%) than males (0.31%). Similarly, a minority, comprising 0.81%, are divorced or separated, with slightly more females (0.98%) than males (0.62%). The largest proportion, representing 27.63%, are widowed or widowers, with a higher percentage of females (38.52%) compared to males (15.46%).

The majority, comprising 83.84% of the total respondents, identify as Hindu, with a slightly higher percentage of males (84.39%) compared to females (83.33%). Muslims account for 5.80% of the respondents, with a slightly higher representation among males (6.49%) than females (5.18%). Christians make up 4.26% of the respondents, with a marginally higher percentage of females (5.18%) compared to males (3.25%). Sikhs represent 5.44% of the respondents, with a nearly equal distribution between males (5.26%) and females (5.60%). A small fraction identifies as Buddhist (0.07%), while atheists and Radha Soami followers each represent 0.29% and 0.07%, respectively. Additionally, 0.22% of respondents refused to answer. Among the respondents, labourers represent 15.94% of the respondents, with a higher percentage of males (18.55%) compared to females (13.59%). Individuals engaged in private or government jobs account for 3.45% of the respondents, with a larger proportion of males (5.26%) than females (1.82%). Those who are self-employed constitute 22.26% of the respondents, with a significantly higher percentage of males (33.38%) compared to females (12.18%). The largest segment consists of individuals who are not working, representing 57.53% of the respondents. Interestingly, while 41.27% of males reported not working, a significantly higher percentage of females (72.27%) fell into this category. Those living with spouse & children males were higher 68.47% compared to females 48.18%. A significant portion of respondents, accounting for 320 individuals (23.51%), reported living with children but without a spouse. In this category, the percentage of males was lower at 14.37%, while females constituted a larger proportion at 31.79%. A smaller subset of respondents, totalling 156 individuals (11.46%), reported living with a spouse only, with males comprising 13.14% and females 9.94%. A minority of respondents, consisting of 65 individuals (4.78%), reported living alone, with males making up 1.85% and females 7.42%. Lastly, a small number of respondents, comprising 33 individuals (2.42%), reported living with relatives, with a slightly higher percentage of males at 2.16% compared to females at 2.66%.

Clinical details

The majority of eye operations were performed on the right eye, accounting for 742 cases (54.52%). Within this group, 56.41% were males, and 52.80% were females. Following closely, 617 individuals (45.33%) underwent eye operations on their left eye, with males representing 43.43% and females 47.06%. A very small number, comprising 2 individuals (0.15%), reported having undergone operations on both eyes, with an equal distribution of males and females, each representing 0.15% and 0.14%, respectively. Among the total of 1361 individuals surveyed, 297 (21.82%) reported using spectacles, while the majority, 1064 (78.18%), indicated not using them. Breaking down the data by gender, it reveals that a higher percentage of males, constituting 25.66%, reported using spectacles compared to females, who accounted for 18.49%. Conversely, the majority of both males and females, 74.34% and 81.51%, respectively, reported not using spectacles. Among the total of 1361 individuals surveyed, 145 (10.65%) reported using both distance and near spectacles, while 79 (5.80%) reported using only distance spectacles, and 73 (5.36%) reported using only near spectacles. The majority of respondents, accounting for 1064 (78.18%), indicated not using any spectacles, categorized as "not applicable" (NA). When examining the data by gender, it shows that a slightly higher percentage of males reported using both types of spectacles (13.45%) compared to females (8.12%). Similarly, for distance spectacles, a higher percentage of males (5.72%) reported usage compared to females (5.88%), while for near spectacles, more males (6.49%) than females (4.48%) reported usage.

Among the total of 1361 individuals surveyed, 74 (5.44%) reported having a very good visual acuity of 6/6-6/12, while 81 (5.95%) reported having a good visual acuity of <6/12-6/18. A larger proportion of respondents, constituting 518 (38.06%), fell into the borderline category of <6/18-6/60, indicating a somewhat compromised visual acuity. The majority of respondents, totalling 659 (48.42%), reported poor visual acuity of <6/60. A small percentage of respondents, accounting for 29 (2.13%), indicated their visual acuity as "NA". When examining the data by gender, similar patterns were observed across all categories of visual acuity, with slight variations between males and females. Out of the total 1361 individuals surveyed, 57 (4.19%) reported having a very good visual acuity of 6/6-6/12, while 97 (7.13%) reported a good visual acuity of <6/12-6/18. A significant portion of respondents, constituting 534 (39.24%), fell into the borderline category of <6/18-6/60, indicating a somewhat compromised visual acuity. Similarly, 644 (47.32%) respondents reported poor visual acuity of <6/60.

When analysing the data by gender, similar trends were observed across all categories of visual acuity, with slight variations between males and females. The categorisation of the visual acuity was done for understating the extent of the visual impairment among the respondents.

Access to eye health

Among the 1,361 respondents, the majority (819, 60.18%) made the decision to visit the eye screening camp independently. This trend was more pronounced among males (476, 73.57%) compared to females (343, 48.04%). Spouses played a significant role in decision-making, with 259 (19.03%) individuals reporting that their husband or wife influenced their decision, particularly among females (170, 23.81%). Sons also played a crucial role, influencing 206 (15.14%) individuals, with a higher percentage among females (150, 21.01%) than males (56, 8.66%). Daughters were decision-makers for 47 (3.45%) respondents, with a larger influence on females (32, 4.48%) compared to males (15, 2.32%). Friends (11, 0.81%), brothers (6, 0.44%), daughters-in-law (2, 0.15%), and mothers (2, 0.15%) also contributed to the decision-making process but to a lesser extent. When it came to attending the camp, 825 (60.62%) individuals came alone, with more males (464, 71.72%) than females (361, 50.56%) choosing to do so. Sons accompanied 247 (18.15%) attendees, again with more females (159, 22.27%) than males (88, 13.60%). Spouses provided support to 130 (9.55%) attendees, more so for females (81, 11.34%) than males (49, 7.57%). Daughters accompanied 70 (5.14%) individuals, with a higher proportion among females (53, 7.42%). Friends (41, 3.01%), villagers (14, 1.03%), brothers (13, 0.96%), sisters (7, 0.51%), and daughters-in-law (4, 0.29%) also played a role in accompanying the attendees.

Regarding transportation, walking was the most common mode, with 444 (32.62%) individuals choosing this option. A slightly higher proportion of females (243, 34.03%) walked compared to males (201, 31.07%). Public transport was widely used, with 373 (27.41%) taking the bus, with more males (192, 29.68%) than females (181, 25.35%). Auto-rickshaws were the next preferred mode, used by 279 (20.50%) respondents, followed by bikes (248, 18.22%). Other modes, such as NGO-arranged vehicles (12, 0.88%) and hired vehicles (2, 0.15%), were used by a small number of participants. Most participants (1,324, 97.3%) reported facing no challenges in reaching the camp. However, 44 (3.2%) individuals mentioned delays due to crowds, while transportation issues were reported by 46 (3.3%). Additionally, 25 (1.8%) respondents needed an escort, and a small percentage had conflicts due to daily wage work (15, 1.1%) or family emergencies (7, 0.5%). A significant portion of the respondents (901, 66.20%) expressed confidence in attending the follow-up camp independently, with males (518, 80.06%) being more confident than females (383, 53.64%). However, 162 (11.90%) participants, predominantly female (130, 18.21%), reported needing an escort. Transportation problems (90, 6.61%), physical issues (103, 7.57%), and financial difficulties (25, 1.84%) were cited as challenges for attending the follow-up visit.

For those planning to attend the follow-up, the majority (638, 46.88%) intended to travel by bus, with a slightly higher proportion of males (316, 48.84%) than females

(322, 45.10%). Auto-rickshaws were the next preferred option, used by 328 (24.10%) respondents, followed by bikes (202, 14.84%). A small number planned to walk (96, 7.05%), while 64 (4.70%) were unsure of how they would travel. A total of 31 (2.28%) planned to hire a car, with all of them being female. Most participants (1,035, 76.05%) believed they would not face any difficulties in attending the follow-up. However, 199 (14.62%) anticipated challenges, with more males (122, 18.86%) expressing concern compared to females (77, 10.78%). The primary issues were transportation (31, 2.28%), physical problems (18, 1.32%), and financial constraints (12, 0.88%). Fear of surgery (7, 0.51%) and the need for an escort (43, 3.16%) were also reported.

Among the respondents, 416 (30.57%) reported they would not need to spend money to attend the follow-up, with less males (180, 27.82%) than females (236, 33.05%) in this category. A significant portion (591, 43.42%) planned to use their savings, with a higher percentage among males (467, 72.18%) compared to females (124, 17.37%). Others relied on family support (321, 23.59%), government pensions (32, 2.35%), or friends (1, 0.07%). The final section of the survey assessed whether participants could return for future hospital visits. The data suggests that 1,035 (76.05%) individuals were confident about returning independently, with a higher proportion of males (467, 72.18%) than females (568, 79.55%). However, 199 (14.62%) respondents anticipated difficulties in returning, with 122 (18.86%) males and 77 (10.78%) females expressing concerns. The primary challenges included transportation issues (31, 2.28%), physical difficulties (18, 1.32%), and financial constraints (12, 0.88%). Additionally, 7 (0.51%) individuals cited fear of surgery as a barrier, while 43 (3.16%) needed an escort for their return visits.

The Chi-square test for gender and spectacle use yielded a Chi-square statistic of 0.0 and a p value of 1.0, indicating no significant association between these variables. This suggests that spectacle use was independent of gender, implying that both males and females had an equal likelihood of using spectacles. Similarly, the Chi-square test for education level and spectacle use resulted in a Chi-square statistic of 0.0 with a p value of 1.0. This indicates that the level of education did not significantly influence spectacle use. Regardless of educational background, participants exhibited similar spectacle usage patterns. The analysis showed no significant relationship between marital status and difficulty in attending follow-up camps (Chi-square=0.0, p=1.0). This implies that marital status did not affect the ability of participants to attend follow-up camps, suggesting that both married and unmarried individuals faced similar challenges or ease in follow-up participation.

To assess the association between different variables, a Chi-square test was conducted for multiple factors, including gender, awareness levels, employment status, and their impact on the ability to return for future visits,

willingness for follow-up care, and financial capacity. The analysis revealed a marginally significant association ($p=0.059$) between gender and the ability to return for future visits, indicating that while gender may play a role, the effect is not statistically strong. However, there was a strong and statistically significant association between awareness levels and willingness for follow-up care ($\chi^2=32.07$, $p<0.001$), suggesting that individuals with higher awareness levels were more likely to seek follow-up care.

A highly significant relationship ($\chi^2=90.43$, $p<0.001$) was also found between employment status and the ability to pay for treatment, confirming that financial capacity is closely linked to employment status. This underscores the need for financial assistance programs to support unemployed individuals in accessing necessary medical care.

Table 1: Demographic profile of the study population.

Categories	Number	%	Male	%	Female	%
Education						
Illiterate	814	59.81	261	40.34	553	77.45
Primary schooling	314	23.07	204	31.53	110	15.41
Secondary schooling	222	16.31	172	26.58	50	7.00
Senior secondary schooling	9	0.66	8	1.24	1	0.14
Technical school	2	0.15	2	0.31	0	0.00
Marital status						
Never married	10	0.73	2	0.31	8	1.12
Currently married	965	70.83	540	83.62	424	59.38
Divorced or separated	11	0.81	4	0.62	7	0.98
Widowed/widower	376	27.63	100	15.46	275	38.52
Religion						
Hindu	1141	83.84	546	84.39	595	83.33
Muslim	79	5.80	42	6.49	37	5.18
Christian	58	4.26	21	3.25	37	5.18
Sikh	74	5.44	34	5.26	40	5.60
Buddhist	1	0.07	0	0.00	1	0.14
Atheist	4	0.29	3	0.46	1	0.14
Radha Saomi	1	0.07	0	0.00	1	0.14
Refused to answer	3	0.22	1	0.15	2	0.28
Occupation						
Driver	11	0.81	10	1.55	1	0.14
Labour	217	15.94	120	18.55	97	13.59
Private/government job	47	3.45	34	5.26	13	1.82
Self employed	303	22.26	216	33.38	87	12.18
Not working	783	57.53	267	41.27	516	72.27
Living with						
Living with children and spouse	787	57.83	443	68.47	344	48.18
Living with children without a spouse	320	23.51	93	14.37	227	31.79
Living with spouse only	156	11.46	85	13.14	71	9.94
Alone	65	4.78	12	1.85	53	7.42
Living with relatives	33	2.42	14	2.16	19	2.66
Eye operated						
Both eyes	2	0.15	1	0.15	1	0.14
Left eye	617	45.33	281	43.43	336	47.06
Right eye	742	54.52	365	56.41	377	52.80
Using spectacles						
Yes	298	21.82	166	25.66	132	18.49
No	1063	78.18	481	74.34	582	81.51
Type of spectacle						
Both	145	10.65	87	13.45	58	8.12
Distance	79	5.80	37	5.72	42	5.88

Continued.

Categories	Number	%	Male	%	Female	%
Near	73	5.36	42	6.49	32	4.48
NA	1064	78.18	481	74.34	582	81.51
Visual acuity RE						
Very good 6/6-6/12	74	5.44	36	5.56	38	5.32
Good <6/12-6/18	81	5.95	38	5.87	43	6.02
Borderline <6/18-6/60	518	38.06	238	36.79	280	39.22
Poor <6/60	659	48.42	319	49.30	340	47.62
NA	29	2.13	16	2.47	13	1.82
Total	1361	100.00	647	100.00	714	100.00
Visual acuity LE						
Very good 6/6-6/12	57	4.19	33	5.10	24	3.36
Good <6/12-6/18	97	7.13	41	6.34	56	7.84
Borderline <6/18-6/60	534	39.24	254	39.26	280	39.22
Poor <6/60	644	47.32	304	46.99	340	47.62
NA	29	2.13	15	2.32	14	1.96

Table 2: Eye health details.

Categories	Number	%	Male	%	Female	%
Any other problem the patient has at present						
Allergy	2	0.15	1	0.15	1	0.14
Blurred vision	75	5.51	46	7.11	29	4.06
Distance blur	3	0.22	3	0.46	0	0.00
Near blur	2	0.15	0	0.00	2	0.28
Corneal opacity	1	0.07	1	0.15	0	0.00
Glaucoma	1	0.07	0	0.00	1	0.14
Eye injury	6	0.44	3	0.46	3	0.42
Excessive watering	34	2.50	3	0.46	31	4.34
Pain	6	0.44	4	0.62	2	0.28
Pain and burning	2	0.15	1	0.15	1	0.14
Itching	2	0.15	1	0.15	1	0.14
Itching and watering	1	0.07	0	0.00	1	0.14
Poor vision	2	0.15	1	0.15	1	0.14
Refractive error	1	0.07	0	0.00	1	0.14
Other eye cataract	26	1.91	16	2.47	10	1.40
Pterygium	4	0.29	2	0.31	2	0.28
No	1193	87.66	565	87.33	628	87.96
Duration of eye problem						
<6 months	370	27.19	180	27.82	190	26.61
6-12 months	469	34.46	203	31.38	266	37.25
1-2 years	320	23.51	158	24.42	162	22.69
2-3 years	144	10.58	73	11.28	71	9.94
>3 years	58	4.26	33	5.10	25	3.50
Information source regarding the screening camp						
ASHA/ANM/AWW/SHG/Panchayat/ religious leaders/Youth Mandal	110	8.08	51	7.88	59	8.26
Family doctor	1	0.07	0	0.00	1	0.14
Government hospital	3	0.22	3	0.46	0	0.00
Health workers (hospital health worker)	297	21.82	132	20.40	165	23.11
MFV field investigator	44	3.23	24	3.71	20	2.80
Other NGO	6	0.44	3	0.46	3	0.42
PHC doctor	2	0.15	1	0.15	1.00	0.14
Publicity and pamphlet	247	18.15	132	20.40	115.00	16.11
Relatives and friends	492	36.15	229	35.39	263.00	36.83
Social sites	2	0.15	1	0.15	1.00	0.14

Continued.

Categories	Number	%	Male	%	Female	%
Spectacle shop	1	0.07	0	0	1	0.14
Through surgery patients	155	11.39	71	10.97	84	11.76
Vision centre	1	0.07	0	0	1	0.14
Decision maker for health-related visits						
Brother	6	0.44	0	0	6	0.84
Daughter	47	3.45	15	2.32	32	4.48
Daughter in law	2	0.15	1	0.15	1	0.14
Friends	11	0.81	4	0.62	7	0.98
Mother	2	0.15	1	0.15	1	0.14
My family	5	0.37	3	0.46	2	0.28
Self	819	60.18	476	73.57	343	48.04
Sister	1	0.07	1	0.15	0	0
Son	206	15.14	56	8.66	150	21.01
Son in law	3	0.22	1	0.15	2	0.28
Spouse (husband/wife)	259	19.03	89	13.76	170	23.81
Companion for camp						
Brother	13.77	1.01	5	0.77	8	1.12
Daughter	72.63	5.34	17	2.63	53	7.42
Daughter in law	4	0.29	0	0	4	0.56
Friends	42.85	3.15	12	1.85	29	4.06
Mother	1.15	0.08	1	0.15	0	0
Self	896.72	65.89	464	71.72	361	50.56
Sister	7	0.51	0	0	7	0.98
Son	260.60	19.15	88	13.60	159	22.27
Son in law	3.31	0.24	2	0.31	1	0.14
Spouse (husband/wife)	137.57	10.11	49	7.57	81	11.34
Owner	2.15	0.16	1	0.15	1	0.14
Relatives	4.46	0.33	3	0.46	1	0.14
Villagers	14.77	1.09	5	0.77	9	1.26

Table 3: Chi-square analysis.

Demographic variables	Outcome variable	P value	Significance
Gender	Spectacle use	1.0	No significant correlation
Education	Spectacle use	1.0	No significant correlation
Marital status	Difficulty attending follow-up camps	1.0	No significant correlation
Religion	Eye operated	1.0	No significant correlation
Gender	Ability to return for future visits	0.059	Marginal significance; weak association
Awareness level	Willingness for follow-up care	0.00	Strong association; statistically significant
Employment status	Ability to pay for treatment	0.00	Very strong association; highly significant

DISCUSSION

The findings from this study provide valuable insights into eye health among a diverse patient population, highlighting both commonalities and distinctions when compared to existing research. One of the notable aspects is the demographic breakdown, which includes a significant proportion of female patients (53%). This mirrors other studies, which have consistently shown a higher prevalence of eye-related issues among women. Hormonal changes, extended lifespans, and gender-specific health disparities contribute to these findings. However, variations are observed in different regions

based on cultural and environmental factors, which can influence this gender ratio.¹¹ Education levels among participants in this study are notably low, with 60% being illiterate. This aligns with findings from several other studies in rural and underserved regions, where low education levels are associated with limited access to healthcare services and decreased health literacy.¹⁴ In contrast, studies conducted in urban or more developed regions tend to show higher educational attainment, correlating with better health awareness and proactive healthcare behaviour.¹² These discrepancies emphasise the need for targeted educational interventions to improve health literacy, especially in low-resource settings.

Marital status also emerged as a significant factor in this study, with 71% of participants being currently married and 28% widowed. Previous research has similarly highlighted how marital status influences health-seeking behaviour. Widows and widowers are often more inclined to engage in healthcare services as a means to ensure ongoing well-being, reflecting social and emotional support as key motivators.¹⁰ This finding is echoed in studies where social support networks, such as family and community, play a critical role in influencing health outcomes. Religion-wise distribution revealed that the majority of participants identified as Hindu (84%), followed by smaller proportions of Muslims (6%) and Sikhs (5%). These figures align with the local demographics but differ from studies in more religiously diverse regions. Research from multi-religious contexts demonstrates that cultural beliefs and practices significantly impact health service utilisation, particularly in sensitive areas like surgical interventions or medical treatment.⁹ Understanding these dynamics is essential for designing culturally sensitive healthcare services that accommodate diverse belief systems.

The occupational distribution in this study predominantly included agricultural and manual labour work, which mirrors findings from similar studies in rural India.¹⁶ These occupations often expose individuals to occupational hazards, increasing their vulnerability to eye-related conditions such as cataracts and low vision. Additionally, socioeconomic challenges, including limited access to higher-paying jobs and financial instability, directly impact the quality and frequency of eye healthcare services sought. Research in comparable regions indicates that employment in high-risk occupations correlates strongly with a higher prevalence of eye health issues.¹²

Visual acuity results highlighted poor vision in a substantial proportion of participants (83% and 85% for right and left eyes, respectively). This is consistent with other studies across rural and semi-urban settings, where cataracts and refractive errors are the leading causes of vision impairment.¹⁵ The need for cataract surgeries and corrective lenses remains paramount in these regions. Furthermore, studies have shown that outreach programs focusing on early detection and treatment of eye diseases significantly improve visual outcomes in populations with limited access to ophthalmic care.¹³

Barriers to accessing eye screening camps were reported by 9% of participants, which corresponds with challenges documented in other studies in similar contexts. Limited transportation, financial constraints, and physical disabilities are often cited as major impediments to accessing healthcare services.

Moreover, findings from community-driven interventions reveal that awareness campaigns and community health workers play crucial roles in overcoming these barriers, ensuring higher participation rates in eye care programs.¹¹

Limitations

The respondents especially women may be hesitant to discuss gender based barriers due to cultural norms or fear of judgement. The study represents those who could access the services, excluding individuals especially women who never reached the system. The strength of the study was that it covered respondents from varied regions giving a broader perspective.

CONCLUSION

This study aligns with broader research in eye health, emphasizing the influence of socio-demographic factors on health outcomes. However, regional nuances require tailored approaches to address specific challenges faced by underserved populations. Enhanced community engagement, education, and accessible healthcare infrastructure are essential in bridging gaps in eye health services.

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