Original Article

Factors limiting the Northeast Indian elderly population from seeking cataract surgical treatment: Evidence from Kolasib district, Mizoram, India

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Purpose: Reliable data on the barriers to the uptake of cataract surgical services in the Northeast Indian states are scanty. The purpose of this study was to assess the barriers to uptake of cataract surgical services among elderly patients and suggest appropriate strategies to reduce these. **Methods:** A cross-sectional study was conducted among patients who failed to avail cataract surgical services, 6–12 months' postinitial diagnosis at a community eye health camp. Validated questionnaire was used to collect information through face-to-face interviews at the residence of the participants. Descriptive statistics and Chi-square tests were conducted to assess the association between the barriers quoted and sociodemographic variables. **Results:** A total of 140 (89.2%) individuals participated in the study, of whom 56 (40%) were aged between 71 and 80 years. The median age for men and women was 73.5 and 72.5 years, respectively. About 57% of participants were female patients. A total of 66 (47.1%) participants had borderline visual acuity followed by those with poor vision (41.4%, $n = 58$). "Bad roads/difficult terrain" ($P = 0.009$), "witnessed bad surgical outcomes in others" and "did not feel important" ($P < 0.024$), "poor overall health status" ($P < 0.001$), "lack of information" ($P = 0.025$) and "no escort" ($P = 0.025$) were significant barriers reported by this population. **Conclusion:** Most of the barriers reported in this study seem to be endogenous in nature and appear to be within the purview of the local eye care service provider to remedy. Counseling and targeted awareness and information, education, and communication strategies could nullify many of the barriers reported in this study.

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Findings from a recent study published in medical journal *The Lancet Global Health* by the vision loss expert group estimates that the global prevalence of visual impairment (VI) has dropped from 4.6% in 1990 to 3.4% in 2015.[1] Although the new data are encouraging, as it shows that the efforts to reduce avoidable blindness in affected countries are working, there remain several gaps, both from the service provider perspective as well as from the patient perspectives that need attention. Over 80% of the avoidable blindness is due to cataract and uncorrected refractive errors, both of which have cost-effective solutions although, in many remote and poor areas in the developing countries, people remain blind from cataract, mainly due to a lack of access to eye care.[2,3] Making services available is only a part of the larger solution to the global problem of VI. Even in places where services are available and accessible, the uptake of services is determined by several factors or barriers that must be addressed if we are to improve the demand for these services and thereby reduce the prevalence of VI.[4] Research from India has shown that the barriers to uptake of services tend to change over time due to several factors. Studies conducted in India between the 1980s and 1990s identified poverty, lack of awareness, lack of transportation, and fear of surgery to be the common barriers to the uptake of services in India.[5-8] However, during the decade of 2000, the barriers identified were willingness of the patient, fatalism and ageism, lack of escort, and work and/or domestic obligations.[9-11] Studies in this current decade revealed that apart from costs, other barriers include awaiting maturation, other health conditions, and interestingly, those that appear to be more related to service providers.[12-15] Majority of these studies on barriers investigated populations in the southern, western, and northern parts of India and none from the northeastern parts of India. We present this study from the Kolasib district of Mizoram in Northeast India with the objective of determining the barriers to the uptake of cataract surgical services and comparing the pattern seen in this part of India and rest of the country.

Methods

A community ophthalmic outreach program was undertaken by a mission hospital in Aizawl district of Mizoram, and as part of this program, an extensive door-to-door eye-screening initiative was undertaken by trained Accredited Social Health Activists (ASHA workers) between August 2015 and April 2016 in all the 39 villages of the district. All adults aged 50 years or older, who were suspected or self-reported to have eye health issues were advised to visit a local eye camp organized in their respective

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villages organized by the same hospital. At these eye screening camps, trained optometrists screened patients for various eye conditions including cataracts and those diagnosed with cataracts and having a visual acuity (VA) reading of <6/24 were referred to the base hospital for further medical assessment.

We conducted a cross-sectional study to understand the barriers to uptake of cataract surgical services in the Kolasib district of Mizoram. A list of patients who failed to turn up at the referral hospital for cataract surgery even after 6 months to 1 year from the date of initial diagnosis at the eye screening camp was prepared, and subsequent preparations for a face-to-face interview were made. The purpose of this interview was to understand the reasons for not availing free cataract surgical services. All those who could understand at least one of the two languages – Mizo or English were considered eligible for participation.

Data collection

The data collection happened from December 2016 to June 2017. Standard research protocols were followed during data collection in accordance with the *Helsinki Declaration*. Each potential participant was contacted by an interviewer trained in the study procedures with the assistance of the ASHA worker. Interviews were conducted at the residence of the participants. Before starting the interview, each participant was explained the nature and purpose of the interview and their verbal consent for participation sought. Subsequently, interviews were conducted in an isolated area within the home premises using a questionnaire designed specifically to meet the objectives of this study. Average interview time was 45 min. The field work was meticulously supervised by field supervisors who also have randomly crossed-verified 10% of the completed surveys on the spot immediately after the completion of the interview and also by revisiting the homes of the respondents to check the documented information within a week of the initial interview. A nonprobabilistic purposive sampling approach was adopted with an aim to recruit all the patients diagnosed with cataract at the eye screening camp but who failed to visit the base hospital for cataract surgery even after 6–12 months from the date of initial screening at camp.

Measures

A questionnaire was designed specifically to meet the objectives of this study based on thorough literature review. The interview documented demographic characteristics of patients including age, sex, education, distance from the hospital, and history of health problems among others. Two rounds of pilot testing of the study questionnaire were undertaken before the start of the study. Based on these pilot exercises, certain definitions were simplified, revisions in vernacular language translation for Mizo was made, and interview techniques improved.

Measures of VA were classified into three broad categories as defined by the World Health Organization as good, borderline, or poor. Good outcome was defined as a VA of better than or equal to 6/18 with the available correction; borderline outcome as 6/24–6/60; and poor outcome as <6/60.[16] VA was measured using a tumbling E Snellen chart. All measurements were taken in full daylight with available correction. If VA was <6/18 in either eye, pinhole vision was tested. Interviews were recorded on paper copies.

Statistical analysis

Microsoft office Excel 2013 and SPSS software (version 20.0, IBM SPSS science Inc., Chicago, IL) was used for data analysis. Descriptive statistics are reported for relevant quantitative variables. Chi-square tests were conducted to assess the association between the barriers quoted by the individuals and sociodemographic variables. $P = 0.05$ was considered as statistically significant for all the estimates.

Results

As part of its comprehensive community eye health program, the mission hospital located in Aizawl district of Mizoram state, a total of 3,466 adults aged 50 years and older were screened by ASHA workers during the door-to-door assessment in all 39 villages in the Kolasib district. Out of these, 2,933 (85%) individuals were referred to local camps organized in respective villages and 1,384 (47.2%) individuals turned up at those camps and were screened for eye conditions. A total of 450 (32.5%) were identified with cataracts and were subsequently referred to the base hospital for further treatment. Of these, 158 (35.1%) patients reported at the base hospital and were operated whereas the remaining majority 292 (64.9%) patients did not visit the hospital to seek cataract surgical services even after 6 months to 1 year from the initial diagnosis at the eye camps. This study included all of these 292 adults. Of these, about 54% ($n = 157$) were successfully contacted, and subsequently, 140 (89.2%) agreed to participate in this study. However, a total of 135 (46.2%) could not be contacted, for reasons such as unavailability of the participant at the time of interview (44.4%, $n = 60$) and migration and inaccessible location (22.2%) each respectively and death of the patient (11.1%, $n = 15$) [Fig. 1].

Sociodemographic and clinical characteristics

Table 1 shows the sociodemographic and clinical characteristics of those who agreed to participate in the study. A total of 140 adults provided interview, of whom 56 (40%) were aged between 71 and 80 years. The median age for men and women was 73.5 and 72.5 years, respectively. About 57% of participants were female patients. Majority of them (80%) were ever married, and about half of them (51.4%, $n = 72$) were involved in some kind of household or domestic work such as taking care of household chores, caring for grandchildren, and feeding cattle. About two-thirds of the participants reported to be living around 51–100 km away from the base hospital that offered them free cataract surgical services. When asked about the quality of roads leading to the base hospital, majority (81%, $n = 113$) reported it to be of "average" quality [Table 1].

A total of 109 (77.9%) individuals reported that they got to know about the eye screening camp through ASHA workers. A total of 139 participants, (99.3%) reported that they were suffering with poor vision since more than 2 years. Interestingly, however, about two-thirds reported that they do not find it difficult to perform their daily tasks [Table 2].

Visual acuity

The grades of VA in the better eye of the patients screened at the eye camps are also presented in Table 2. Overall, a total of 66 (47.1%) had borderline VA followed by those in the poor category (41.4%, $n = 58$). A higher proportion of males had borderline VA (55%) as against females who had poor VA (47.5%) outcomes. A total of 124 (89.2%) patients were advised for cataract surgery in both the eyes.

Barriers to uptake of cataract surgical services

The most common reason quoted for not seeking cataract surgical services were "bad roads/difficult terrain" and "poor

health status" (17.9%; $n = 25$ each), followed by "no money for hospital stay and food expenses" (15.7%; $n = 22$) and "fear of surgery" (12.1%; $n = 17$).

More number of female patients reported, "bad roads/difficult terrain" as a significant barrier for not seeking cataract surgical services ($P = 0.009$). Male patients, on the other hand, reported "heard about or witnessed bad surgical outcomes in others" and "did not feel important" ($P < 0.024$) as significant barriers [Table 3].

Elderly patients aged more than 80 years (37.8%, $n = 14$, $P < 0.001$) were significantly more likely to report "poor health status" as a barrier for not availing cataract surgery as against those relatively younger (aged 70 years or less) who tend to report "lack of information" as a significant barrier (46.8%, $n = 10$, $P = 0.025$). Patients with relatively good VA in the better eye reported: "no escort" as a significant barrier to the uptake of cataract surgery ($P = 0.025$) [Table 3].

Discussion

We report on barriers to utilization of cataract surgical services in one of the most remote geographies in the country. Bad roads/difficult terrain, heard about or witnessed bad surgical outcomes in others either directly or indirectly through members' family or neighborhood, did not feel important, lack of information, poor overall health, and no escort were significant barriers reported

Table 1: Distribution of sociodemographic characteristics among patients in Kolasib district, Mizoram

Variable	Categories	Patients who failed to get cataract surgical services		
		Total (n=140), n (%)	Male (n=60), n (%)	Female (n=80), n (%)
Age (years)	50-60	14 (10)	4 (6.7)	10 (12.5)
	61-70	33 (23.6)	13 (21.7)	20 (25)
	71-80	56 (40)	25 (41.7)	31 (38.8)
	>80	37 (26.4)	18 (30)	19 (23.8)
Marital status	Ever married	111 (79.3)	53 (88.3)	58 (72.5)
	Never married	29 (20.7)	7 (11.7)	22 (27.5)
Distance from hospital (km)	<50	13 (9.3)	1 (1.7)	12 (15)
	51-100	93 (66.4)	44 (73.3)	49 (61.3)
	>100	34 (24.3)	15 (25)	19 (23.8)
Occupation	Indulge in outdoor work	34 (24.3)	20 (33.3)	14 (17.5)
	Indulge in domestic work	72 (51.4)	24 (40)	48 (60)
	Do not work	34 (24.3)	16 (26.7)	18 (22.5)
Quality of roads	Good	-	-	-
	Average	113 (80.7)	44 (73.3)	69 (86.3)
	Bad	27 (19.3)	16 (26.7)	11 (13.8)
Attitudes of family members	Supportive	59 (42.1)	32 (53.3)	27 (33.8)
	Unsupportive/not applicable	77 (55)	27 (45)	50 (62.5)

Table 2: Visual acuity and vision-related characteristics among patients in Kolasib district, Mizoram

Variable	Categories	Patients who failed to get cataract surgical services		
		Total (n=140), n (%)	Male (n=60), n (%)	Female (n=80), n (%)
Duration of poor vision (years)	≤2	1 (0.7)	0 (0)	1 (1.3)
	>2	139 (99.3)	60 (100)	79 (98.8)
Difficulty in performing daily tasks	Yes	50 (35.7)	27 (45)	23 (28.8)
	No	90 (64.3)	33 (55)	57 (71.3)
Source of information about the eye camp	Well-known hospital in the region	1 (0.7)	1 (1.7)	0 (0)
	ASHA workers	109 (77.9)	41 (68.3)	68 (85)
	Through villagers	28 (20)	17 (28.3)	11 (13.8)
	Not sure/do not know	2 (1.4)	1 (1.7)	1 (1.3)
Visual acuity in the better eye	Good	16 (11.4)	7 (11.7)	9 (11.2)
	Borderline	66 (47.1)	33 (55)	33 (41.2)
	Poor	58 (41.4)	20 (33.3)	38 (47.5)
Eye advised for cataract surgery	Right eye	8 (5.8)	5 (8.3)	3 (3.8)
	Left eye	7 (5)	4 (6.7)	3 (3.8)
	Both eyes	124 (89.2)	51 (85)	73 (92.4)

ASHA: Accredited social health activists

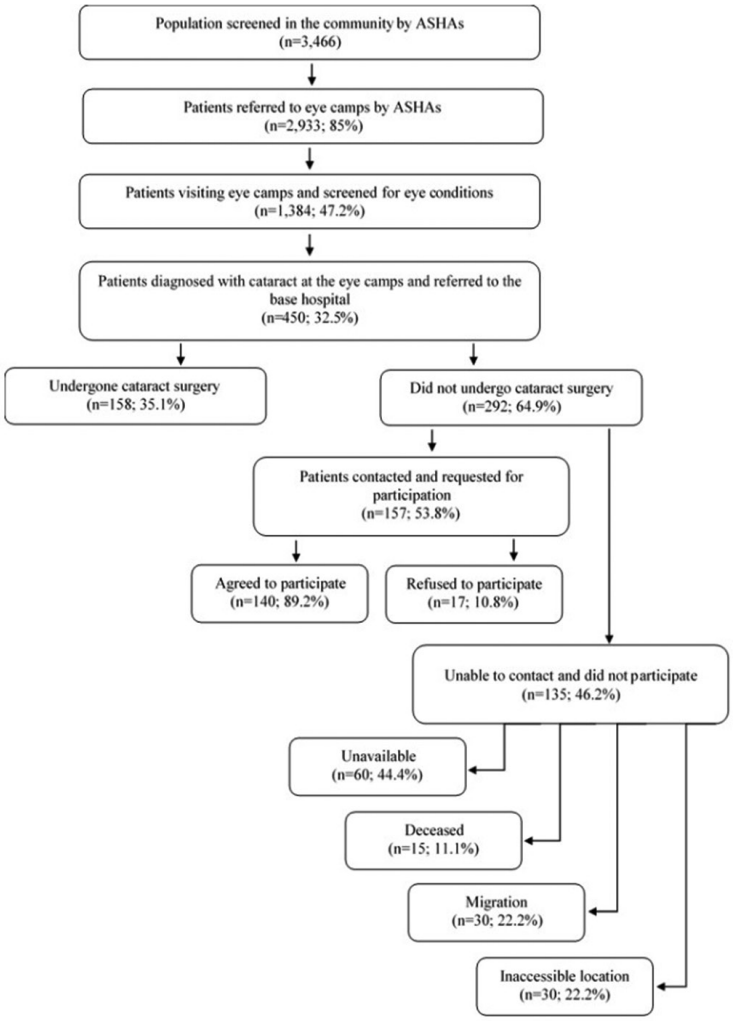

Figure 1: Participation details of the patients in the Kolasib district of Mizoram

by this predominantly elderly and dependent population. Very little is known about the factors influencing the utilization of eye health services from this part of the country. The results of this study build on the prior evidence from other parts of the country on the barriers to utilization of cataract surgical services.[5,11,14,17-19] Gupta and Murthy reported from a study that was conducted over two decades ago, that accessibility was a leading barrier for uptake of cataract surgical services followed by economic and other reasons.[20] Studies done in other poor, rural settings across the world, also reveal that poor conditions of the roads are indeed a major barrier to eye care services.[21-23] In this study, the majority of the participants (66.4%) also reported that they reside between 51 and 100 km from the treating hospital and a quarter of them even beyond 100 km. A substantial number of them (81%) reported that the quality of the road network in this region was average, implying that for at least half the distance, the road quality was bad. With <50% of all-weather motorable road connectivity with the public health systems, Mizoram has one of the pitiable road networks in the country.[24] Two decades since Gupta and Murthy highlighted poor accessibility as a primary limiting factor, "bad roads" still continue to affect health-seeking behaviors of populations in India, certainly in some parts of north-eastern states. Efforts to build and expand motorable road networks could further increase demand for eye care services in this region. The recent progress made in rural road building activity as part of the *Pradhan Mantri Gram Sadak Yojana*, a publicly funded national rural road construction program across India is a welcome step in that direction.[25] In addition, arranging for patient transportation facilities by the treating hospital from the campsite to the base hospital and back would encourage some of these patients to opt for cataract surgeries.

"Heard about or witnessed bad surgical outcomes in others," "did not feel important," "lack of information," and "no escort" also standout as significant reasons for not availing cataract surgical services in this study. Unlike "bad roads" which is an exogenous factor influencing the health-seeking behaviors, these other barriers reported in this study are more endogenic in nature, implying that these barriers could be fixed or addressed by the local health-care service provider at the micro level. The community eye camps organized by this base hospital to screen patients in their villages consisted of three staff – an optometrist, a project assistant, who is largely responsible for patient mobilization related activities and a driver. There was no counselor available to provide counseling, information, education, and communication (IEC) services to patients in these camps. Previous studies from other parts of the country too have reported "need not felt important," "no one to accompany," and "no information" as prominent barriers and have argued in favor of increased IEC activities to generate demand for

Table 3: Barriers for the uptake of cataract surgical services by gender, age, and visual acuity in the better eye among elderly patients in Kolasib district, Mizoram

Type of barrier	Total (%)	Gender (%)		Age-years (%)				Visual acuity in the better eye (%)		
		Male	Female	50-60	61-70	71-80	>80	Good	Borderline	Poor
No money*	22 (15.7)	8 (13.3)	14 (17.5)	2 (14.3)	7 (21.2)	10 (17.9)	3 (8.1)	2 (12.5)	10 (15.2)	10 (17.2)
No escort†	4 (2.9)	2 (3.3)	2 (2.5)	0 (0)	1 (3)	3 (5.4)	0 (0)	2 (12.5)	0 (0)	2 (3.4)
Heard about or witnessed bad surgical outcomes in others‡	7 (5)	6 (10)	1 (1.3)	1 (7.1)	2 (6.1)	4 (7.1)	0 (0)	1 (6.2)	4 (6.1)	2 (3.4)
Fear of surgery§	17 (12.1)	5 (8.3)	12 (15)	2 (14.3)	3 (9.1)	5 (8.9)	7 (18.9)	0 (0)	8 (12.1)	9 (15.5)
Myths, misconceptions and superstitions‖	2 (1.4)	2 (3.3)	0 (0)	0 (0)	0 (0)	2 (3.6)	0 (0)	0 (0)	1 (1.5)	1 (1.7)
Bad roads and/or difficult terrain¶	25 (17.9)	5 (8.3)	20 (25)	2 (14.3)	4 (12.1)	12 (21.4)	7 (18.9)	4 (25)	10 (15.2)	11 (19)
Did not feel important**	7 (5)	6 (10)	1 (1.3)	0 (0)	2 (6.1)	4 (7.1)	1 (2.7)	1 (6.2)	5 (7.6)	1 (1.7)
Poor health status††	25 (17.9)	15 (25)	10 (12.5)	0 (0)	6 (18.2)	5 (8.9)	14 (37.8)	4 (25)	13 (19.7)	8 (13.8)
Family problems‡‡	12 (8.6)	4 (6.7)	8 (10)	2 (14.3)	2 (6.1)	7 (12.5)	1 (2.7)	1 (6.2)	8 (12.1)	3 (5.2)
Lack of information§§	15 (10.7)	6 (10)	9 (11.3)	4 (28.6)	6 (18.2)	3 (5.4)	2 (5.4)	0 (0)	6 (9.1)	9 (15.5)
Other reasons‖‖	4 (2.9)	1 (1.7)	3 (3.8)	1 (7.1)	0 (0)	1 (1.8)	2 (5.5)	1 (6.2)	1 (1.5)	2 (3.4)
Total	140 (100)	60 (100)	80 (100)	14 (100)	33 (100)	56 (100)	37 (100)	16 (100)	66 (100)	58 (100)

*No money to pay for stay and food expenses at the hospital. Chi-square test for significance *P*=0.334, 0.460, and 0.886 for gender, age, and VA in the better eye, respectively, †Chi-square test for significance *P*=0.575, 0.429, and 0.025 for gender, age, and VA in the better eye, respectively, ‡Chi-square test for significance *P*=0.024, 0.440, and 0.778 for gender, age, and VA in the better eye, respectively, §Chi-square test for significance *P*=0.176, 0.478, and 0.243 for gender, age, and VA in the better eye respectively, ‖Chi-square test for significance *P*=0.182, 0.385, and 0.873 for gender, age, and VA in the better eye respectively, ¶Chi-square test for significance *P*=0.009, 0.711, and 0.627 for gender, age, and VA in the better eye, respectively, **Chi-square test for significance *P*=0.024, 0.622, and 0.319 for gender, age, and VA in the better eye, respectively, ††Chi-square test for significance *P*=0.046, *P*<0.001, and 0.506 gender, age, and VA in the better eye respectively, ‡‡Chi-square test for significance *P*=0.352, 0.311, and 0.363 for gender, age, and VA in the better eye, respectively, §§Chi-square test for significance *P*=0.520, 0.025, and 0.174 for gender, age, and VA in the better eye respectively, ‖‖Other barriers include no vehicle, spouse got operated. Chi-square test for significance *P*=0.425, 0.392, and 0.559 for gender, age, and VA in the better eye, respectively. VA: visual acuity

services while at the same time alienating misconceptions.[5,8,11,14] A dedicated counselor conducting one-on-one or one-to-group counseling sessions in such camps would remove this barrier of lack of information, misinformation, and misconceptions. The role of counseling in improving uptake of cataract surgeries is well established.[26-28] It is, therefore, recommended that in large-scale community eye camps and community mobilizations should make a mandatory provision for a dedicated full-time counselor to address these otherwise avoidable barriers. The role of digital technology in addressing the knowledge and communication gap is enormous in these setting although the robust scientific investigation into this is warranted.

Furthermore, a tiny yet significant proportion of patients reported "no escort" as a barrier, which was also reported previously.[5,8,11,14] This barrier too is within the purview of the eye health service providers to remedy. The standard operational practice pertaining to community eye camps at this base hospital and other similar large private charitable hospital in this region do not allow for an escort/family member to accompany the patients to the hospital for surgery. Irrespective of the reasons for adopting such an approach, be it for ease of service provision, convenience or cost, minor administrative and operational policy changes, at the hospital level, with regard to allowing an escort to accompany could negate this barrier fully, given that these patients were elderly and dependent.

A significant high proportion of patients, specifically men, reported "poor overall health" as a significant barrier. In the elderly, vision impairment is often one of a myriad of comorbid conditions, and its presence can complicate medical care. Studies found an association between older age and utilization of eye care services and attributed this to old age health problems.[29,30] Although we have not delved into the exact causes of these other ailments, we suspect these to be age related. Provision of general health screening and medications for minor and common comorbidities at the campsite could encourage the elderly to seek cataract surgeries when fit.

No money to pay for food and stay at the hospital was also stated as an important barrier in this study though this association was not significant. Although the cataract surgery was provided free of charge, patients were expected to meet other incidental expenses on their own. To nullify the effects of these indirect costs, health service delivery programs need to consider ways to address the issues related to "indirect costs" by covering these costs also as part of comprehensive eye care service provision and reduce the economic burden on the patient.

On the whole, various studies – some, as old as quarter-century ago to the most recent ones, have all highlighted a variety of barriers for the uptake of cataract surgical services in India.[5,8,11,14-16,20] Some studies have even reported a shift in the barriers over time.[5,14] Moreover, the barriers identified in this study are in no way different from that of the previous studies. Despite the many studies and their suggestions and recommendations, these barriers to uptake of services still linger around and appear to remain unaddressed. In the absence of standard operational guidelines or policy from the government on the organization of eye camps or large-scale community eye screening initiatives, such avoidable barriers continue to persist.

The study has certain limitations. We have deliberately sampled all the dropout patients since the numbers were low and it did not allow for randomization in the sampling process. Therefore, our findings may be biased. As barriers to

cataract surgery are a complex issue, it needs a comprehensive investigation at the community level. We have conducted this study in one of the eight districts in this state, and the findings may not be generalizable to the entire state. Hence, our results should be interpreted with caution.

Conclusion

Majority of the patients in this study reported bad roads/difficult terrain as common barrier followed by a host of other significant barriers such as "poor health status," "heard about or witnessed bad surgical outcomes in others," "did not feel important," "lack of information," and "no escort." Most of the barriers reported seem to be endogenous to the local eye care service provider and appear to be within their purview to resolve. The role of a dedicated counselor in community outreach eye camps is warranted as many of these barriers could be reversed with proper counseling of the patients at the campsite. Intensive and targeted awareness and IEC strategies in the region could help generate demand for cataract surgical services. Finally, minor administrative and operational policy changes, at the treating hospital level, such as providing free patient transportation facilities and allowing for an attendant to accompany the patient to the base hospital would improve demand for cataract surgical services.

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Conflicts of interest

There are no conflicts of interest.

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