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Barriers for the uptake of cataract surgery: A rural community-based study

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Background: Cataract is the leading cause of blindness. Various national programmes have been undertaken to reduce its prevalence. Several barriers in the rural community and individuals exist which decreases the uptake of cataract surgery. Knowledge of factors would help in improving surgical uptake in rural patients and a decrease in blindness rate.

Aim: This study aimed to evaluate the factors preventing cataract surgery acceptance in rural patients.

Setting: An observational cross-sectional study was conducted between June 2019 to December 2019 in eye screening camps in rural areas of south Karnataka, India.

Methods: An observational cross-sectional study was conducted between June 2019 and December 2019. A total of 4114 patients were screened at camps, out of which 500 patients above the age of 50 years, diagnosed with cataracts but had refused cataract surgery earlier, were included. Data were collected on demography, visual acuity, cataract or lens status, source of information on cataract surgery in camps, reasons for refusal of cataract surgery previously. Barriers to cataract surgery uptake (CSU) were classified as attitudinal, social, economical and psychological factors and reasons for uptake of cataract surgery in the current visit were recorded in the form of a questionnaire and analysed.

Results: The mean age of the participants was 65.8 years. The male to female ratio was 1.1:1. The prevalence of cataract blindness in our study population was 11.5%, which was significant (p = 0.000). Announcements and pamphlets were the most common source of information on cataract surgery in camps. Significant barriers to CSU were attitudinal factors, mainly the ability to manage daily work (66.4%) with cataract; one eye had an adequate vision (57.4%). The next common barrier was an economic factor as they waited for a camp to avail themselves of free service (61.5%). The least common barriers were female gender (13.2%), fear related to surgery (11.8%), old age (9.6%), God's will/fate (6.2%), lack of transport (5.4%). The critical factors in CSU in the camps were a provision of free surgery, accessible transport, the camp being conducted closer to their home and motivation by the health workers.

Conclusion: Although economic barriers were efficiently taken care of by the government through national programmes, attitudinal barriers seem to be the most important barriers to achieve the goal of reducing blindness because of cataract in rural population.

Keywords: attitudinal barriers; barriers; cataract surgery uptake; camps; rural.

Introduction

Cataract is one of the leading causes of avoidable blindness globally (65.2 million).[1] In 1976, India launched the National Programme for Control of Blindness (NPCB) to reduce the prevalence of blindness to 0.3% by 2020. To decentralise the efforts, NPCB established the District Blindness Control Society (DBCS) in every Indian district in 1994–1995. Under this programme, cataract surgery with intraocular implantation was provided free of charge through public–private partnerships.[1]

The prevalence of cataracts in India is approximately seven million and around 6.15 million cataract cases are added to this number each year.[2] In 2016–17, under NPCB, 6.5 million people in India were operated for cataracts.[1] Nirmalan et al. estimated the prevalence of cataracts in southern India's rural population as 47.5%.[3] An increase in life expectancy, growth of the ageing population, lower socioeconomic status and diabetes are the identified risk factors for cataract-related blindness in rural India,[4] which add to the increasing prevalence of cataracts in India, thus increasing the backlog for cataract surgery.

Eye care needs are higher in rural settings where significantly few health workers are involved in eye care. Also, several barriers exist at the individual and community level in the rural population in accessing cataract surgery. Thus, knowledge of these factors would help to understand the obstacles faced by rural folks and addressing them would improve cataract surgical uptake (CSU) in rural patients. Therefore, we aimed to study the factors preventing cataract surgery's acceptance in rural patients.

Methods

An observational cross-sectional study was conducted at a tertiary care medical college hospital in south Karnataka, India. Being a part of DBCS, ours is a base hospital where cataract surgery is performed free of cost and patients are provided free food, transportation and post-operative drugs. Eye screening camps are conducted in rural areas in Bengaluru and Ramnagar, Tumakuru, Chickaballapur and Kolar in south Karnataka. A medical social worker (MSW) manages the campaigning about free camps, distributing pamphlets and making announcements a week before the camp date in the surrounding villages. Camps were organised at the nearest primary health centre of the designated place, which were attended by a team of ophthalmology residents, interns and nurses.

During the study period between June 2019 and December 2019, 4114 patients were screened at camps. Patients aged above 50 years, diagnosed with cataracts but refused cataract surgery earlier, were included in the study to determine barriers to CSU. We excluded all patients with a history of trauma, corneal disease, glaucomatous disc changes and macular disease, which could cause decreased vision.

Data were collected on demography, visual acuity, cataract/lens status, source of information on cataract surgery in camps and reasons for refusal of cataract surgery previously. Barriers to CSU were classified as attitudinal, social, economic and psychological factors. Facilitators for the uptake of cataract surgery in the current camp were also studied. We trained two resident doctors to administer questions in a predesigned proforma, and they were supervised periodically by an offsite consultant. The epidemiologist performed content validation of the proforma after a pilot study. We obtained the written informed consent from all patients. The interviewers questioned all patients in their local language and recorded their responses.

We expressed the quantitative factors in terms of mean and standard deviation or median with interval range. We presented the qualitative parameters relating to visual acuity, barriers and facilitators as percentages. Differences in mean values were tested for statistical differences by student's *t*-test or by an appropriate non-parametric test of significance. Any association between the factors were studied by Chi-square or Fischer's test of significance. Data were analysed using Statistical Package for Social Sciences (SPSS) for Windows, version 16.0 (SPSS Inc., Chicago, United States).

Ethical considerations

We conducted this study after obtaining ethical approval from the Institutional Review Committee, Ethical Review Board of the Ramaiah Medical College Hospital, Bangalore (ERB number: MSRMC/EC/AP-06/11-2019).

Results

We interviewed a total of 500 patients who met the inclusion criteria in this cross-sectional study. The age ranged from 50 years to 96 years with a mean age of 65.8 years (standard deviation [s.d.]: 7.9). The male to female ratio was 1.1:1, with an almost equal prevalence. Below 65 years of age, females accounted for 54.7% of the cases and males 45.3%, whilst after 65 years, females were 32.4% of the patients and males accounted for 67.6% ($p = 0.000$, Fisher's exact test). The main occupation was agriculture 231 (46.2%), followed by daily wage labourers 115 (23.0%).

The mean duration of decreased vision before the patients presented to camp for cataract surgery was 7.3 months (range: 1–60 months). The cataract/lens status of patients is shown in Table 1. Bilateral cataract 315 (63.0%) was more common than unilateral cataract 185 (37.0%). Our study defined bilateral cataract blindness as both eyes with cataracts and a visual acuity < 3/60 in the better eye. The cataract blindness in our study population was seen in 57 (11.5%) patients, which was significant ($p = 0.000$, risk estimate 3.048 for cohort blindness, confidence interval [CI]: 1.53–6.0). The majority of the patients had immature cataracts and 2.4% had bilateral mature cataracts and hyper mature cataracts. Amongst the pseudophakics, the other eye had mature cataract in 30 (17.9%) and hyper mature cataract in 12 (7.1%) patients.

When asked about the source of information on cataract surgery in camp, 287 (57.3%) of the patients reported announcements and pamphlets as the most common source, as shown in Figure 1.

Barriers to CSU are listed in Table 2. Amongst the attitudinal factors, ability to manage work despite the presence of cataract was the most commonly reported barrier seen in 332 (66.4%) patients. Out of 235 females, only 31 (13.2%) stated the female gender as a barrier to CSU. Other reason that hindered CSU amongst 35.4% of the individuals in the age group 60–69 years was 'too busy/had no time from household chores/work'. 'God's will/fate' was stated as a barrier to CSU by 9.8% of the

TABLE 1: Cataract/lens status of patients.

Cataract/Lens status	Right eye		Left eye	
	n	%	*n*	%
Immature	321	64.4	338	67.6
Mature	57	11.4	59	11.8
Hypermature	16	3.2	20	4.0
Pseudophakia	95	19.0	75	15.0
Others (clear lens, aphakia, phthsis)	11	2.0	8	1.6
Total	**500**	**100.0**	**500**	**100.0**

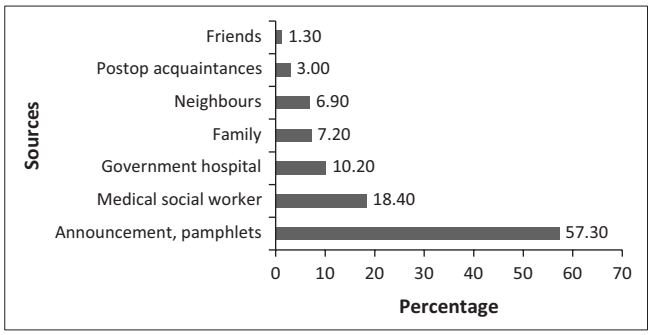

FIGURE 1: Source of information on cataract surgery in camp.

TABLE 2: Barriers to cataract surgery uptake.

Reasons for not taking up cataract surgery	Total		Male		Female	
	n	%	*n*	%	*n*	%
Attitudinal factors						
Old age	48	9.6	24	4.8	24	4.8
Female gender	235	-	NA	-	31	13.2
Could manage daily work	332	66.4	176	35.2	156	31.2
One eye had an adequate vision/could see clearly with the other eye	287	57.4	158	31.6	129	25.8
Too busy/had no time from household chores/work	155	31	83	16.6	72	14.4
It's God will/fate	31	6.2	19	3.8	12	2.4
Social factors						
Festival/family functions to attend	32	6.4	19	3.8	13	2.6
No accompanying person/lack of family support	74	14.8	38	7.6	36	7.2
Family problems (children not taking care, living single)	51	10.2	28	10.6	23	9.7
Economic factors	-	-	-	-	-	-
Worried about the cost of surgery/lack of financial support	109	21.8	57	11.4	52	10.4
Waiting for the camp to avail free service	308	61.5	160	32.0	148	29.5
Lack of transport	27	5.4	12	2.4	15	3.0
Psychological factors						
Fear of undergoing surgery	24	4.8	11	2.2	13	2.6
Fear of losing eyesight after cataract surgery	15	3.0	10	2.0	5	1.0
Fear of cataract surgery causing death	11	2.2	6	1.2	5	1.0
Heard about bad surgical outcomes in other patients who underwent cataract surgery	9	1.8	6	1.2	3	0.6

NA, not applicable to males.

patients above 70 years. Amongst pseudophakics who delayed surgery on the second eye, the common reason was that the operated eye had an adequate vision (75.6%) and did not feel the need for second eye surgery, which was statistically significant ($p = 0.000$). A total of 71 (14.2%) patients reported being told to wait for the cataract to mature before surgery.

When we analysed the social factors, lack of accompanying person or family support was the most commonly reported barrier in 74 (14.8%) individuals. Due to their economic constraints, 308 (61.5%) were waiting for the camp to avail free service. Fear of undergoing cataract surgery was the common psychological factor in 24 (4.8%) individuals, which was similar in males and females.

We also studied the reasons for the uptake of cataract surgery in the current visit, shown in Figure 2. A total of 438 patients

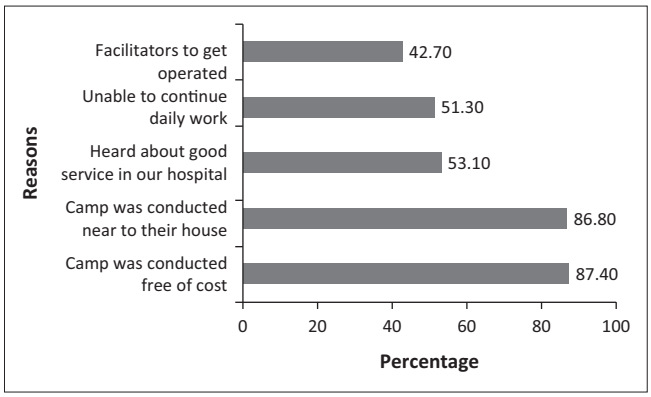

FIGURE 2: Reasons for uptake of cataract surgery in current visit.

(87.4%) revealed that CSU was because of the camp being conducted free of cost, whilst 435 (86.8%) stated the camp's proximity to their house as a reason for CSU. Facilitators who motivated them to get operated on were mostly health workers or MSW in 151 (70.5%) patients, followed by family members in 31 (14.4%) individuals.

Discussion

The barriers to CSU vary across regions based on the economic and social milieu of the region. A better understanding of the perceived barriers helps in planning and better implementation of services and hence helps in reducing the burden of cataract blindness.

The mean age in our study was 65.8 years. Finger et al. observed the mean age in their study as 59.6 years, and in a study carried out in northeast India, the mean age was greater than 70 years.[5,6] In our study, women below 65 years were willing for cataract surgery earlier than their male counterparts, which was significant and similar to a study performed in coastal Pakistan.[7] Studies in Kenya and Bangladesh found that male attendance was higher in the younger age group.[8] However, studies in Madagascar and south India showed no such association.[5,9]

The prevalence of cataract blindness is said to be more in females that is attributed to their gender, longer life expectancy and the difference in the utilisation of cataract surgical programmes.[10,11] It is also observed that women who are illiterate and in rural areas have a higher prevalence of cataract blindness and lower CSU.[12] Our study showed no gender difference in CSU, similar to a study by Finger et in south India and Ghana, but in contrast to studies in Kenya and Bangladesh, where the CSU was higher amongst men.[5,8,13] Although studies are divided on gender predilection of CSU, we found that prevalence was similar in both males and females, probably because camps were conducted closer to the patient's houses and there was no hindrance in accessing cataract services.

Agriculture being the major occupation in rural India, 66.4% of the patients stated that they could manage daily work in the field despite being affected by cataracts and 30.9% said they were too busy due to sowing/harvesting season. Daily

wage labourers were worried about a loss of pay during the surgical and post-operative period and hence hesitated to undergo surgery as it would add to their economic constraints. If these individuals are educated about the utility of cataract surgery in enhancing vision for their work utility, this attitudinal barrier can be broken.

Bilateral cataract blindness in a study by Amritanand et al. in south India was reported to be 6.2%.[14] The high prevalence of bilateral cataract blindness in our study (11.5%) could be because of the study design. We included only patients who had previously refused to undergo cataract surgery. In our study, 14.2% of the patients reported that they were told to wait for the cataract to mature by an optometrist/doctor at camp/primary health centre but were not specified the duration. Gimbel and Dardzhikova reported in their study that waiting for cataract surgery beyond six months resulted in increased vision loss, decrease in quality of life, depression, falls and fractures.[15] Hence, in outreach programmes, individuals with immature cataracts must also be treated and not refused surgery until the cataract matures or vision drops.

In our study, the MSW advertised the camp details in local language through public announcement systems and distribution of pamphlets read out by social workers/ shopkeeper/village head/family members, and this was stated as the most common source of information on cataract surgery by the patients, identifying public announcements as the most effective way of disseminating knowledge about cataract surgery. A rural Chinese study indicated that friends and relatives were their most important source of information.[16] Neighbours and post-operative acquaintances were significant facilitators in bringing individuals to eye services in a study by Amritanand et al.[14] In our study, they accounted for only 9.9%.

Amongst the social factors, lack of family support was the primary reason for refusing surgery in 54.0% patients in a study by Beisen et al. in Kenya and 27.0% patients in a study conducted by Finger et al. in Hyderabad.[17,18] A study by Liu et al. suggested that targeting family members may positively impact CSU.[19] In our study, only 14.8% of the individuals reported lack of family support as the reason and it did not show any gender differences and we found using MSWs the most effective way of encouraging patients for cataract surgery.

In a study by Ormsby et al., 44.4% patients feared the procedure of cataract surgery.[20] Fletcher et al. reported low uptake of eye services in rural India because of fear.[21] However, the total fear factor in our study was only 11.8%. In a study by Briesen et al., 38.0% patients heard about the bad surgical outcome, mostly rumours of intentionally spoiling eye by doctors or students in training, which is in contrast to our results where we found that fear of bad surgical outcome was only 1.8%.[17] About 53.1% had heard about good surgical outcomes and wanted to get operated on in our hospital. Preoperative screening of patients by consultants, supervised training of residents and good post-operative outcomes all ensured the quality of service in our hospital. This strengthens the findings suggested by Finger et al. in their study that there are benefits to the community in providing high-quality services and regular outreach in the same location, ideally by the same provider with the same support organisation.[5]

Our study's least common barriers were female gender (13.2%), fear related to surgery (11.8%), old age (9.6%), God's will/fate (6.2%) and lack of transport (5.4%). Distance from the hospital (20.0%) and lack of connectivity to main roads (7.0%) were the barriers to service delivery in an Indian council of medical and research study.[22] Amritanand et al. reported that lack of family support and fear were the major barriers to their study.[14] A feasible outreach screening camp, assistance with transport, accommodation and free food addressed these obstacles in our study and increased the CSU, especially in women. It thus helped to bring cataract surgical camps closer to the community.

In 1999, a study by Vaidyanathan in Karnataka concluded that awareness, attitudes and surgery affordability are no longer the major barriers in most districts.[23] In our study, however, the major barriers to CSU were related to patient's attitude ability to manage daily work, one eye having an adequate vision or could see clearly with the other eye, busy with work were the common reasons stated by patients. These findings were similar to a study conducted by Dhaliwal et al.[22] The next common barrier was the economic factor, as they waited for a camp to avail themselves free service and refusing cataract surgery earlier due to the cost of surgery. Similar results were seen in a study by Patil et al. (22.0%) and Amritanand et al. (8.1%).[14,24]

When we analysed the most critical factors facilitating CSU, we found that an eye camp with the provision of free surgery, free transport and closer to their home indirectly reduced the cost burden and transportation or connectivity problems to hospital, thus improving CSU. A study by Xiu et al. also found that free cataract surgery significantly increased the CSU.[25] However, a study by Amritanand et al. in southern India, showed that only 4.2% of cataract patients said that the outreach camp near their home negatively impacted their decision about the surgery.[14] In our study, health workers or MSW were the most critical facilitators who motivated patients to get operated on in camp. Thus, emphasising the importance of utilising the MSW and collaborating with local influencers such as social workers, village heads and shopkeepers is an essential step in achieving a higher CSU rate.

The limitation of our study was that there could be response bias, as we chose only patients who accepted cataract services currently, which they had refused earlier. A possibility of recall bias where patients only recalled factors facilitating CSU rather than reasons for refusing cataract surgery earlier could not be excluded. This could be addressed by conducting a study on patients who refuse cataract surgery when they are advised for it.

We have seen that the barriers to CSU have changed over the decade. The economic and social barriers that were more important in the last decade have been well addressed by the district outreach programmes, which have nearly eliminated those barriers. However, as we enter into the next decade, we find that attitudinal barriers seem to be the most critical barriers, and these can be overcome by creating awareness on cataract surgery through media and utilising existing human resources, who would be the facilitators in bringing about attitudinal/behavioural change amongst individuals and rural community to improve the uptake of services. Thus, strengthening the existing cataract services and enhancing methods to address the attitudinal barriers will be the way to eliminate avoidable blindness because of cataract in the next decade.

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Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

S.S. and T.G.P. were involved in conceptualisation of the study, supervision, data analysis and manuscript preparation. N.D. was involved in data collection and data analysis.

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Data availability

The data that support the findings of this study are available upon special request from the corresponding author, T.G.P.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

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