
A Cross-sectional Study on Awareness and Knowledge about Eye Donation among Rural Versus Urban Population in Eastern India

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Abstract

Aim/Purpose:

The purpose of this study is to compare & assess the awareness and knowledge about eye donation among rural and urban population in Eastern India with International scenario.

Methodology:

A cross-sectional descriptive study was conducted among rural and urban population. A total of 345 (mean age: 47±2.53 years) participants- male=190 & female=155, married=264, unmarried=81, were enrolled in this study. A modified questionnaire was used to collect data from the participants through an eye care awareness camp. All the collected data was processed and analysed by Chi-square test in SPSS version 21.

Results:

It was found that out of 345 subjects, [173 rural& 172 urban subjects], 91 (52.6%) and 134 (77.9%) were know about eye donation in rural and urban population respectively. Awareness

camp (49.8%) was the top source of information. However only 10.4% (rural) & 6.9% (urban) participants were willing to donate their eyes, while 24.9% & 36.6% participants need time to donate their eyes in rural and urban respectively. Individuals 97.5% rural and 96% urban participants even don't know which part of eye removed after death. All factors mentioned were found to be statistically significant ($p < 0.05$) with the Pearson Chi-square test in SPSS version 21.

Conclusion:

Although awareness levels to donate eyes are high or satisfactory among the rural and urban population in Eastern India, while there was lack of willingness to donate eyes. There is a high need for focussed information, education, and communication campaigns to encourage eye donation in Eastern India.

Keywords: Optometry, Eye donation, Education, Population

1. Introduction

Blindness and vision impairment still be vital public health issues in India.¹ Globally, 285 million people are estimated to be visually impaired, of whom 39 million are blind and 246 million persons have low vision.² The burden of visual impairment in India is estimated at 62 million; of these, 8 million are blind and 54 million persons have low vision.³ Rural population in India was reported at 65.53 % in 2019, according to the World Bank collection of development indicators, compiled from officially recognized sources.⁴ Corneal blindness is the fourth leading cause of blindness worldwide.⁵⁻⁶ The majority causes of corneal blindness in the form of trachoma affects 4.9 million individuals. Other major causes of corneal blindness include ocular trauma, xerophthalmia, ulceration, ophthalmia neonatorum, onchocerciasis, leprosy, and the use of traditional eye medications.⁷⁻¹² It is estimated that a significant proportion of donor corneas are unsuitable for corneal transplantation.¹³ In the Current ratio of available safe donor eyes, 2.77 lakhs donor's eyes are needed to perform, 1 lakh corneal transplants in a year in India.¹⁴ The Government of India (GOI) has, through NPCB (National Programme for Control of Blindness), has tried to reduce the backlog of blindness through comprehensive eye care services, including corneal transplantation.¹⁵ Over the years, the Eye Bank Association of India has made efforts to increase the corneal procurement rate. This presently stands at 49,000 per year, however still a lot needs to be done to combat the number of corneal blindness cases which are added every year, few studies suggest that number to be as high as 30,000 cases every year.¹⁶⁻¹⁸ Eye donations are often enhanced by increasing public encouragement or, by understanding and overcoming the factors to eye donation. Although the factors decisive public prospective and awareness are mentioned at length over the last few years.¹⁹⁻²⁵

All we need to know about eye donation²⁶

- ❖ Eye donation is donating one's eyes when his/her death.
- ❖ Only corneal blind people are benefitted from donated eyes.
- ❖ Corneal blindness is that the loss of sight due to injury within the tissue covering the front of the eye called the cornea.

- ❖ Everyone can donate their eyes no matter of age, sex, and blood group.
- ❖ The cornea ought to be removed within an hour of death.
- ❖ Eyes of donated person can save the vision of two corneal blind people.
- ❖ Eye removal takes solely 10-15 minutes and leaves no scar or disfigurement of the face.
- ❖ Donated eyes are never bought or sold. Eye donation is not refused.
- ❖ Contact your near eye bank to become a registered eye donor.

Corneal transplantation is an efficient treatment choice for several patients with corneal disease, with a high success rate in restoring sight. Unfortunately, a majority of factors in performing corneal transplants is the availability of donor tissue, especially in Asian nations.²⁷ so that, every people need to donate their eyes after death to restoring the correctable corneal blindness.

2. Methodology

2.1 Research design-

This study was a cross-sectional survey based study among rural and urban population in Eastern India. The study included all the profession (worker, business-man, tailor, housewife, barber, serviceman, students, nurse, fisher, teachers, salesman), who agreed to participate in this study. The study was conducted in Eastern India (Kolkata, West Bengal).

2.2 Time frame

It was conducted between September to October month of 2021.

2.3 Sample size

It was included 345 participants including rural and urban area participants.

2.4 Sampling procedure

This study was included clustered-sampling methods to collect the data by adopted a validated questionnaire previously used in a related study in India and Abroad.²⁸⁻³⁰ The questionnaire was modified according to objective of this study, it was entitled as a Google form to collect data through an eye care awareness camp in rural and urban areas, who agreed to participate in this study.

It comprised 16 close-ended questions that explored demographic data, knowledge, attitudes and factors towards eye donation.

2.5 Inclusion criteria

It was included only above than 20 years of age participants, who agreed to participate in this study.

2.6 Data Analysis

Data were captured and analysed with the Statistical Programme of Social Sciences (SPSS) version 21. Descriptive statistics were used to analyse values such as frequencies, mean, standard deviation, cross tabulation and percentage of collected data. Chi-square test was used to analysed

association between relevant variables. A p-value of <0.05 was considered statistically significant.

Table 1: Demographics of Rural & Urban participants (N=345).

Characteristics	Rural		Urban		Total	
	N (173)	%	N (172)	%	N (345)	%
Age						
20-30	40	23.1	43	25.0	83	24.1
31-40	36	20.8	38	22.1	74	21.4
41-50	39	22.5	51	29.7	90	26.1
51-60	38	22.0	25	14.5	63	18.3
>60	20	11.6	15	8.7	35	10.1
Gender						
Male	98	56.6	96	55.8	194	56.2
Female	75	43.4	76	44.2	151	43.8
Marital status						
Married	137	79.2	130	75.6	267	77.4
Unmarried	36	20.8	42	24.4	78	22.6
Literacy						
Literate	45	26.0	132	76.7	177	51.3
Illiterate	128	74.0	40	23.3	168	48.7
Occupation						
Worker	27	15.6	14	8.1	41	11.9
Business-man	48	27.6	64	37.2	112	32.5
Tailor	5	2.9	2	1.2	7	2.0
Housewife	50	29.0	36	21.0	86	24.9
Barber	4	2.3	2	1.2	6	1.7
Serviceman	11	6.4	15	8.7	26	7.5
Students	22	12.7	28	16.3	50	14.5
Nurse	0	0	2	1.2	2	0.6
Fisher	3	1.7	0	0	3	0.9
Teacher	2	1.2	5	2.8	7	2.0
Salesman	1	0.6	4	2.3	5	1.5

3. Results

This study was found that out of 345 subjects, [173 rural & 172 urban subjects], 91 (52.6%) and 134 (77.9%) were know about eye donation in rural and urban population respectively. Awareness camp (49.8%) was the top source of information. However only 10.4% (rural) & 6.9% (urban) participants were willing to donate their eyes, while 24.9% & 36.6% participants need time to donate their eyes in rural and urban respectively. Individuals 97.6% rural and 96% urban participants even don't know which part of eye removed after death. All factors mentioned

were found to be statistically significant ($p < 0.05$) with the Pearson Chi-square test in SPSS version 21.

Table 2: Participants knowledge rate towards eye donation.

Variables	Characteristics	Rural		Urban		P-value
		N (173)	%	N (172)	%	
Knowledge about eye donation	Yes	91	52.6	134	77.9	P<0.05
	No	82	47.4	38	22.1	
Whom do you approach for eye donation?	Eye bank	123	71.1	114	66.3	P<0.05
	Family	6	3.5	4	2.3	
	Hospital	44	25.4	54	31.4	
Who should remove the eye from donor?	Correct	38	22.0	42	24.4	P<0.05
	Incorrect	135	78.0	130	75.6	
Within how much time after death should the eyes be removed?	Correct	132	76.3	134	77.9	P<0.05
	Incorrect	41	23.7	38	22.1	
What is removed from the donor eye?	Correct	4	2.4	7	4.0	P<0.05
	Incorrect	169	97.6	165	96.0	
What is transplanted from the donor eye?	Correct	6	3.5	10	5.8	P<0.05
	Incorrect	167	96.5	162	94.2	

Table 3: Source of awareness about eye donation among rural and urban participants.

Variables	Rural		Urban		P-value
	N (173)	%	N (172)	%	
Willingness to donate eyes-					P<0.05
Yes	18	10.4	12	7.0	
No	31	17.9	18	10.5	
May be	69	39.9	74	43.0	
Don't know	12	6.9	5	2.9	
Need time	43	24.9	63	36.6	

Table 4: Willingness about eye donation among rural and urban participants.

Variables	Rural		Urban		P-value
	N (173)	%	N (172)	%	
Willingness to donate your close relative's eyes-					
Yes	1	0.6	2	1.2	P<0.05
No	12	6.9	9	5.2	
May be	14	8.1	19	11.1	
Don't know	129	74.6	133	77.3	
Need time	17	9.8	9	5.2	

Table 5: Willingness about their close relative's eye donation among rural and urban participants.

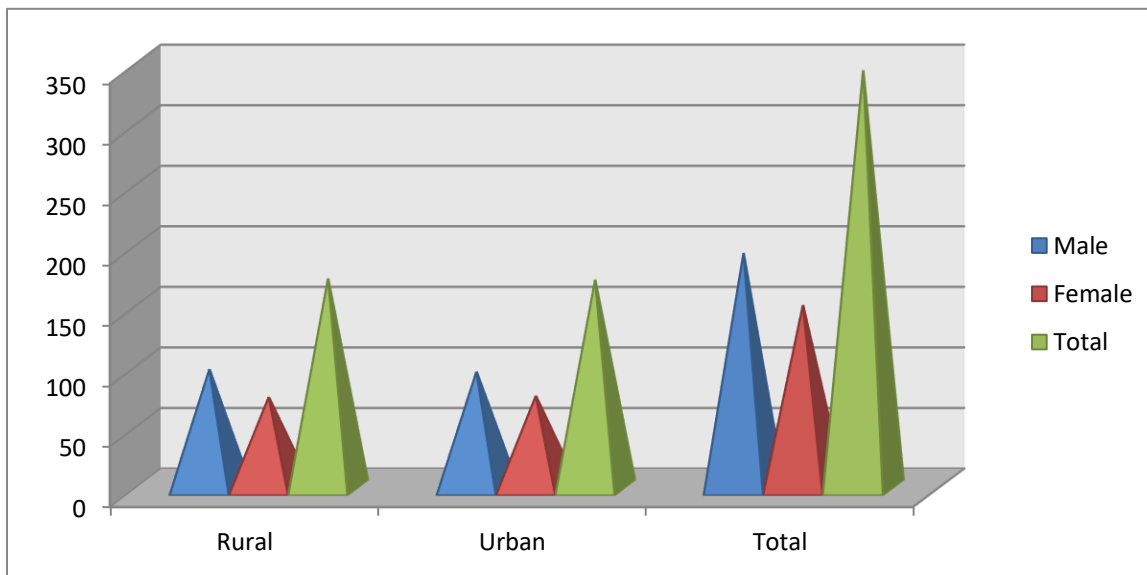


Figure 1: Gender Frequency distribution.

4. Discussion

This study reports the knowledge and awareness about eye donation among rural and urban population in Kolkata (Eastern India). In this study willingness to donate eyes is lesser than previous study.

Table 6: Discussion.

Present study	B. Lal et al.³⁰	Gaunekar A. et al.³¹
1. Study conducted in Kolkata, Eastern India.	1. Study conducted in Goa, South-western India.	1. Study conducted in Goa, South-western India.
2. Cross-sectional survey based study (May-August, 2021).	2. Cross-sectional survey based study (Jan-May, 2017).	2. Cross-sectional descriptive study (March-May, 2017)
3. 345 participants responded to the questionnaire.	3. 340 participants responded to the questionnaire.	3. 300 participants responded to the questionnaire.
4. 10.4% (rural) & 6.9% (urban) participants were willing to donate their eyes.	4. 42.6% participants were willing to donate their eyes.	4. 32% participants were willing to donate their eyes.
5. This study conducted among rural and urban populations.	5. This study conducted among AHS, medical and nursing students.	5. This study conducted among patients attending ophthalmology OPD.
6. Data analysis was performed using Chi square test by SPSS version 21.0	6. Data analysis was performed using Chi square and Fisher exact test by SPSS version 20.0	6. Data analysis was performed using Chi square test by SPSS version 20.0
7. A 'p' value of < 0.05 was considered as significant.	7. A 'p' value of < 0.05 was considered as significant.	7. A 'p' value of < 0.05 was considered as significant.

Various studies reports the knowledge, awareness and willingness score about eye donation among Allied health sciences, medical, nursing as well as engineering students in various location in India.

Barsha Lalet al.³⁰ found that awareness and knowledge of Allied health sciences, medical and nursing students was statistically better in Goa. 42.6% participants were willing to donate their eyes. Jenifaet al.³⁴ found that the level of awareness and attitude regarding eye donation was higher among paramedical than nursing students. Only 35% participants were willing to donate their eyes. Gaunekar A et al.³¹ found that awareness was maximum through mass media and hospital. Only about 32% participants were willing to donate their eyes. Muthukrishnan et al.³² found that awareness about eye donation among medical students were higher on various parameters over engineering students. However, Rajesh et al.³³ were using structured questionnaire for interview of subjects who accompanied patients attending four ophthalmic clinics. It was found that nobility and pleasure was the main motivational force stated for willingness to donate eyes. About 62% participants were willing to donate their eyes.

Table 7: Willingness to donate eyes 2016-21.

Study name	Year of study	Location	Willingness to donate eyes (%)
Present study	2021	Kolkata	17.3
B. Lal et al. ³⁰	2017	Goa	42.6
Gaunekar A. et al. ³¹	2017	Goa	32
Muthukrishnan et al. ³²	2017	Puducherry	87.4
Rajesh et al. ³³	2016	Bhopal	61.9
Jenifa et al. ³⁴	2016	Bhopal	35

In recent times, many more people aware of eye donation sufficiently, but they won't donate their eyes. There are many barriers or myths behind unwillingness like Feeling that one is too old or unhealthy to donate,³⁵⁻³⁸ Religious objections,³⁷⁻⁴² Desire to maintain body integrity after death,⁴³⁻⁴⁶ Concerns about family's support of the decision to donate,⁴⁵⁻⁴⁷ Lack of awareness about eye donation or need for more information,⁴⁸⁻⁵⁰ etc. So there is a high need to conduct research which encourages and spread exact facts about donation, surely after encouragement and myths busting, peoples will willing to donate their eyes and close relatives eyes too.

5. Conclusion

The major source of awareness information was received through mass media followed by eye hospitals and so on. There are a lot of misconceptions among the populations regarding eye donation. Only half of them were aware that the current spectacles users can donate eyes however only one-third were aware that people with chronic diseases can donate eyes. This is an important issue that can be targeted in future campaigns meant to create awareness.

There is also a high need for governments and NGOs (involved in eye care health activities) to ensure that the necessary action plans and policy measures to encourage the rural as well as urban communities towards eye donation after death by various activities like mass media, doctors counseling, eye donation campaign, etc.

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Declarations

Author contributions:

All authors contributed in data collection, analysis and drafting the manuscript, reviewed and edited the manuscript, study design, gathering relevant research papers, conceptualisations, read and approved the final manuscript.

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References

- Neilsen D'Souza et al; The role of optometrists in India: An integral part of an eye health team; Indian J Ophthalmol. 2012 Sep-Oct; 60(5): 401–405.
- Mariot SP. Global data on visual impairment 2010. Bull World Health Organization. 2012. WHO/NMH/PBD/12.01.
- Pascolini D, Mariotti SP. Global estimates of visual impairment: 2010. Br J Ophthalmol 2012; 96; 614-18.
- <https://www.tradingeconomics.com/india/rural-population-percent-of-total-population-wb-data.html>
- Bourne RRA, Jonas JB, Bron AM, et al. Prevalence and causes of vision loss in high-income countries and in eastern and central Europe in 2015: magnitude, temporal trends and projections. Br J Ophthalmol 2018; 102; 575–85.
- Pascolini D, Mariotti SP. Global estimates of visual impairment. Br J Ophthalmol. 2012;96 (5):614–618.
- Gupta N, Tandon R et al. Burden of corneal blindness in India. Indian J Community Med Off Pub Indian Assoc Prev Soc Med. 2013; 38(4):198-206.
- Taylor KI, Taylor HR: Distribution of azithromycin for the treatment of trachoma. Br J Ophthalmol 1999, 83(2):134–135.
- Thylefors B: Epidemiological patterns of ocular trauma. Aust N Z J Ophthalmol 1992, 20(2):95–98.

- Whitcher JP, Srinivasan M: Corneal ulceration in the developing world—a silent epidemic. *Br J Ophthalmol* 1997, 81(8):622–623.
- Chirambo MC, Benezra D: Causes of blindness among students in blind school institutions in a developing country. *Br J Ophthalmol* 1976, 60(9):665–668.
- Yorston D, Foster A: Traditional eye medicines and corneal ulceration in Tanzania. *J Trop Med Hyg* 1994, 97(4):211–214.
- Dandona R, Dandona L, Naduvilath TJ, McCarty CA, Rao GN: Awareness of eye donation in an urban population in India. *Aust N Z J Ophthalmol* 1999, 27(3–4):166–169.
- Saini JS: Realistic targets and strategies in eye banking. *Indian J Ophthalmol* 1997, 45(3):141–142.
- National Blindness Control Program. Statewise Targets and Achievements for Various Eye Diseases during 2015-2016. New Delhi, India: National Blindness Control Program; 2016.
- Saini JS. Realistic targets and strategies in eye banking. *Indian J Ophthalmol* 1997; 45:141-2.
- Ramayamma International Eye Bank: Celebrating 25 years. Hyderabad, India: Department of Communications L V Prasad Eye Institute; 2014.
- National Programme for Control of Blindness. Available from: <http://pbhealth.gov.in/pdf/Blindness.pdf>
- Gupta PC, Duggal M, Jamir L, Sharma D, Kankaria A, Sathyanath S, et al. Knowledge and Attitude toward corneal donation among high school children in Northern India. *Cornea* 2017;36:611-6.
- Krishnaiah S, Kovai V, Nutheti R, Shamanna BR, Thomas R, Rao GN. Awareness of eye donation in the rural population of India. *Indian J Ophthalmol* 2004; 52:73-8.
- Tandon R, Verma K, Vanathi M, Pandey RM, Vajpayee RB. Factors affecting eye donation from postmortem cases in a tertiary care hospital. *Cornea* 2004;23:597-601.
- Yew YW, Saw SM, Pan JC, Shen HM, Lwin M, Yew MS, et al. Knowledge and beliefs on corneal donation in Singapore adults. *Br J Ophthalmol* 2005; 89:835-40.
- Gupta N, Tandon R, Gupta SK, Sreenivas V, Vashist P. Burden of corneal blindness in India. *Indian J Community Med* 2013; 38:198-206.
- Bhandary S, Khanna R, Rao KA, Rao LG, Lingam KD, Binu V. Eye donation- Awareness and willingness among attendants of patients at various clinics in Melaka, Malaysia. *Indian J Ophthalmol* 2011;59:41-5.
- Ronanki VR, Sheeladevi S, Ramachandran BP, Jalbert I. Awareness regarding eye donation among stakeholders in Srikulam district in South India. *BMC Ophthalmology* 2014;14:25.
- National health portal: National eye donation fortnight 2019; https://www.nhp.gov.in/national-eye-donation-fortnight-2019_pg, Accessed on 31 Oct. 2021.

- Hong J, Shi W, Liu Z, et al. Limitations of keratoplasty in China: a survey analysis. *PLoS One*. 2015;10(7):e0132268.
- L.F Alanazi et al. Attitude, beliefs and awareness towards corneal donation in Saudi Arabia; *Saudi Journal of Ophthalmology* (2019) 33, 121-129.
- Bharti MK, Reddy SC, Tajunisah I, Ali NA. Awareness and knowledge on eye donation among university students. *Med J Malaysia*. 2009;64(1)41-45.
- B. Lal et al. Awareness and knowledge on eye donation among Allied Health Sciences, medical, and nursing students in Goa; *J of Current Ophthalmol* 30 (2018) 255-262.
- Gaunekar A. Eye donation awareness and willingness among patients attending ophthalmology OPD at Goa medical college and hospital. *Trop J Ophthalmol Otolaryngol*. 2020;5 (8):243-249.
- Vallinayagam M, Kumar PS, Krishnamoorthy J, Arumugam R. A study on eye donation awareness among medical and engineering students in Puducherry. *Delhi J Ophthalmol*. 2017; 28 (1):20-24.
- Ahirwar RK, Shidhaye PR, Ekka IJ, Saxena DM. Study of knowledge and willingness regarding eye donation among medical students of a tertiary care teaching hospital of central India. *Int J Community Med Public Health*. 2016;3(9):2363-2368.
- Tigga MJ, Agarwal PC, Gupta S, Singh H, Khan N, Laad S. Level of awareness and attitude regarding eye donation among nursing and paramedical staff working in tertiary care centre. *J Evid Based Med Health*. 2016;3(44):2189-2193.
- Gupta A, Jain S, Jain T, Gupta K. Awareness and perception regarding eye donation in students of a nursing college in Bangalore. *Indian J Community Med*. 2009;34(2):122–125.
- Singh MM, Rahi M, Pagare D, Ingle GK. Medical students' perception on eye donation in Delhi. *Indian J Ophthalmol*. 2007;55(1):49–53.
- Eze BI, Okoye O, Eze JN. Knowledge and attitudes regarding eye donation and corneal transplant: medical versus nonmedical university students in a developing country in Africa. *Exp Clin Transplant*. 2014; 12(5):454–461.
- Williams AM, Allingham RR, Beckwith HS, Liu PJ, Santiago-Turla C, Muir KW. Patient and family attitudes about an eye donation registry for research. *Curr Eye Res*. 2013;38 (9):945–951.
- Hussen MS, Gebreselassie KL, Woredikal AT, Adimassu NF. Willingness to donate eyes and its associated factors among adults in Gondar town, North West Ethiopia. *BMC Ophthalmol*. 2017; 17 (1):178.