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Original Research Article

A study to evaluate understanding, beliefs and behaviour pattern regarding eye donation among medical students at a tertiary teaching hospital in Western India

Hetaj Sheth[1]*, Kshama Popat[2], Satyam Kumar[1], Sejal Jain[1], Amit Shah[1]

[1]Dept. of Ophthalmology, Smt. B. K. Shah Medical College, Vadodara, Gujarat, India
[2]Dr. Thakorbhai V Patel Eye Institute, Vadodara, Gujarat, India

Abstract

Background: 0.9% of the total blindness in India is attributable to corneal causes which can be treated by keratoplasty. Lower rates of eye donation are the major hurdle for doing keratoplasty. Gujarat is one of the leading states in India for eye donation and keratoplasty yet rates of eye donation are low and it needs to escalate. Discerning medical students will spread knowledge in society and can augment the eye donation rates not only in Gujarat but also in India. Keeping this in mind, this study was designed to evaluate eye donation knowledge among medical students.
Aim and Objective: To evaluate the level of understanding, beliefs and behaviour pattern i.e. overall awareness about eye donation among medical students.
Materials and Methods: This was a cross-sectional, descriptive study conducted on medical students at a tertiary institute. A questionnaire containing 20 questions based on understanding, beliefs and behaviour pattern - mainly willingness to donate eyes after death, was given to all the students and the responses were recorded and analysed.
Results: All 301 students who participated had understanding that eyes can be donated after death, but only 21.9% had proper knowledge of the ideal time of donation i.e. within 6 hours of death. Just 29.9% knew that eye bank is the correct place to contact for eye donation. About 34.9% students believed that eyes can be donated by near relative's consent without prior pledging. 59.1% of the students had an idea that cornea is the part which is transplanted after eye donation. The main reason observed by the students for lower rates of eye donation was lack of awareness (38.9%). Educational institutes, medical personnel and television were the important sources of information about eye donation according to the students.
Conclusion: Understanding level appears to be less, and more efforts are required for imparting it to medical students, who in turn will transfer it to the mass population, resulting in increased eye donation.

Keywords: Eye donation, Keratoplasty, Awareness, Medical Students.

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1. Introduction

Vision is one of the 5 special senses and is very important for human beings and its impairment has got serious psychological consequences. As per the meta-analysis by K Pseudovs et al, "There are about 40-45 million blind people worldwide out of which about 15 million blind people are in India".[1] Corneal causes are one of the significant shareholders of blindness in India - account for 0.9-1% of them. Moreover, some blindness causing corneal etiologies like scars are cosmetically unwelcome and other like bullous keratopathy are painful and need prompt treatment. Transplantation of the cornea (Keratoplasty) is their treatment. According to the data gap analysis between transplantable corneal blindness and current status of transplantation done by Dr. Samar Basak, "In India, around 0.42 million people are corneal blind and they are increasing with every passing year".[2,3] Various strategies implemented by National Programme for Control of Blindness (NPCB) to decrease blindness includes corneal transplantation also.[4] According to the statistics of Eye Bank Association of India (EBAI), "The current eye donation rate in India is 22,000 eyes/year of which many are unsuitable or unsafe to use for transplantation.[5] Depending on our current availability of safe donor tissues, we will need ~ 2,77,000 donor eyes to perform ~100,000 corneal transplants in a year in India".[6] So,

*Corresponding author: Hetaj Sheth
Email: hetaj85@gmail.com

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we require eye donation to increase by 12 times in India. The most common hinderance to corneal transplantation is non-availability of donor eyes thus causing a large difference between number of recipients and donor eyes.[7] Various studies have described that even though there is an inclination towards eye donation after death but the actual scenario is different because of lack of knowledge about the eye donation as in whom to contact or when to call and this results in reduced eye donation and in turn corneal transplants in the society.[5,8,9] Among Indian states, regarding numbers of eye donation, Karnataka, Tamil Nadu, Telangana and Andhra Pradesh are topping the list whereas states like Gujarat, Uttar Pradesh come in middle order and states like Goa, Jammu-Kashmir and some North-East states have poor facilities and rates of eye donation. To increase the eye donation rates, raising the level of mass education on eye donation is important. Medical students are the future healthcare providers of the country. Medical students i.e. future doctors with good understanding will positively motivate people and will hopefully increase the eye donation rates in India. Considering Gujarat as a middle order state i.e. average representing state of all India, we planned this study so as to get idea about level of knowledge in Gujarat's medical students. While studying existing literature on eye donation awareness, two articles by Chowdhury et al. in Odisha and Lal B. et al. in Goa inspired us to do study on similar lines in Gujarat.[10,11] On researching eye donation awareness studies done in Gujarat, to the best of our knowledge, study done by Dodia et al. is the only one.[12] Considering this, the study was designed to assess eye donation related understanding, beliefs and behaviour patterns among medical students in Gujarat.

2. Materials and Methods

A cross-sectional descriptive study was done on the 1st and 2nd year M.B.B.S. students of Smt. B. K. Shah Medical College, Vadodara, Gujarat after obtaining approval of Ethical Committee. It was done from 25th August to 8th September. The consent for conducting the study was taken from all the participating students.

2.1. Inclusion criteria

All the students of 1st and 2nd MBBS were included in the study.

2.2. Exclusion criteria

3rd MBBS students were excluded from our study as ophthalmology is already there in their syllabus and it can be a confounding factor which can skew the results with bias. Since we want to assess baseline level trend of knowledge in MBBS students, they have been excluded.

A total number of 336 students are there in 1st and 2nd MBBS in the institute. Hard copy of below mentioned questionnaire was given to 20 students for pilot testing. On receiving their responses, no ambiguities were found so we proceeded with the study.

A questionnaire in the form of Google form was e-mailed to each student. It contained questions on participant's age and gender related details, their understanding and beliefs about eye donation, their cited reasons for opting for eye donation / not opting for eye donation and their sources of information for eye donation, etc. 301 out of 336 students responded to the questionnaire. So, our sample size is 301. The responses given by the students were analysed and expressed as percentage.

Questionnaire:

1. Age
2. Education
   a. 1st MBBS student
   b. 2nd MBBS student
3. Sex
   a. Male
   b. Female
4. Email address:
5. Are you aware that donated eyes can give eyesight to the blind?
   a. Yes
   b. No
6. From where did you get awareness about eye donation?
   a. I am not aware about eye donation
   b. Doctors / Hospitals
   c. Educational Institutes
   d. Conventional media: TV/Newspapers
   e. Friends/Family
   f. Other sources
7. Can a blood relative or a spouse opt to donate eyes of a deceased without prior pledging?
   a. Yes
   b. No
   c. Don't know
8. Do you know where to contact to opt for eye donation?
   a. Yes
   b. No
9. Most appropriate place to approach for eye donation?
   a. Any hospital
   b. Eye hospital
   c. Eye Bank
   d. Any of the above
   e. I don't know
10. Ideal time within which eyes of the deceased have to be enucleated for eye donation
    a. Immediately within 30 minutes
    b. Within 2 hours
    c. Within 6 hours
    d. Within 12 hours
    e. Within 24 hours
    f. Don't know

11. Appropriate place for the procedure of enucleation for eye donation?
    a. Hospital where the death took place
    b. Home of the deceased
    c. Both
    d. Eye bank
    e. Don't know
12. Is eye donation acceptable from deceased of any age?
    a. Yes
    b. No
    c. Don't know
13. Is eye donation acceptable from deceased with refractive errors?
    a. Yes
    b. No
14. Is eye donation acceptable from deceased who have undergone cataract surgery?
    a. Yes
    b. No
    c. Don't know
15. Who can benefit from eyes received from eye donation?
    a. Patients with poor vision due to corneal disease
    b. Patients with poor vision due to glasses
    c. Patients with poor vision due to retinal disease
    d. Patients with poor vision due to cataract
16. Which part of donated eye is transplanted?
    a. Cornea
    b. Retina and Optic nerve
    c. Whole eye
    d. Don't know
17. Is the identity of the donor revealed to the recipient at the time of corneal transplantation?
    a. Yes
    b. No
    c. Don't know
18. What do you think – Why people don't donate eyes?
    a. People are not aware of the concept of eye donation
    b. People are not aware of whom to contact for eye donation
    c. People believe that deceased eyes are unsuitable for donation due to health conditions
    d. Disfigurement of the face of the deceased
    e. Procedure causes a delay in funeral process
    f. Religious restrictions
    g. Others
19. Will you opt for eye donation of your eyes?
    a. Yes
    b. No
    c. Not sure
20. What can be done to improve awareness regarding eye donation?
    a. Increase campaigns in conventional media
    b. Increase campaigns in social media
    c. Eye donation topic to be included in school curriculum
    d. Eye donation pledge card to be introduced at college level

3. Results and Analysis

Out of 301 students, who participated in the study, 142 (47.1%) were females and 159 (52.9%) were males. 158 were 1st MBBS students and 143 were 2nd MBBS students. All students were of age group 18-22 years. 286 (95%) out of 301 students were aware that eye donation can give vision to the blind.

Their sources of information / understanding about eye donation are listed in **Figure 1**. Most common source of information was from educational institutes - 93(31%) participants got information about eye donation from their school/college.

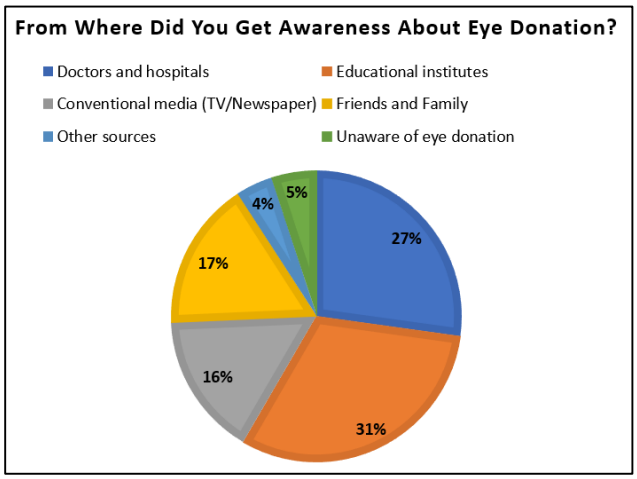

Figure 1: Source of awareness about eye donation

105 (34.9%) students correctly knew that a blood relative or a spouse can donate eyes of a deceased with their consent without prior pledging, 81 (26.9%) believed that they cannot donate eyes of a deceased without prior pledging and 115 (38.2%) were not aware.

Only 90 (29.9%) students knew that eye bank is the correct place to approach for eye donation, and only 66 (21.9%) students knew that ideal time to enucleate the eyeballs after death is within 6 hours. So, the awareness about the correct place for eye donation and ideal timing for eye donation is low.

162 (54%) students knew correctly that ideal place for enucleation can be both - the home of the deceased or the hospital where death took place.

Table 1 enlists responses of students to some understanding-based questions.

Table 1: Responses to understanding-based questions

Understanding Based Questions	Responses		
	Yes (N = No. of students)	No (N = No. of students)	Don't Know (N = No. of students)
Is eye donation acceptable from deceased of any age?	126 (41.9%)	69 (22.9%)	106 (35.2%)
Is eye donation acceptable from deceased with refractive errors?	94 (31.2%)	89 (29.6%)	118 (39.2%)
Is eye donation acceptable from deceased who have undergone cataract surgery?	70 (23.3%)	100 (33.2%)	131 (43.5%)
Is the identity of the donor revealed to the recipient at the time of corneal transplantation?	54 (17.9%)	135 (44.9%)	112 (37.2%)

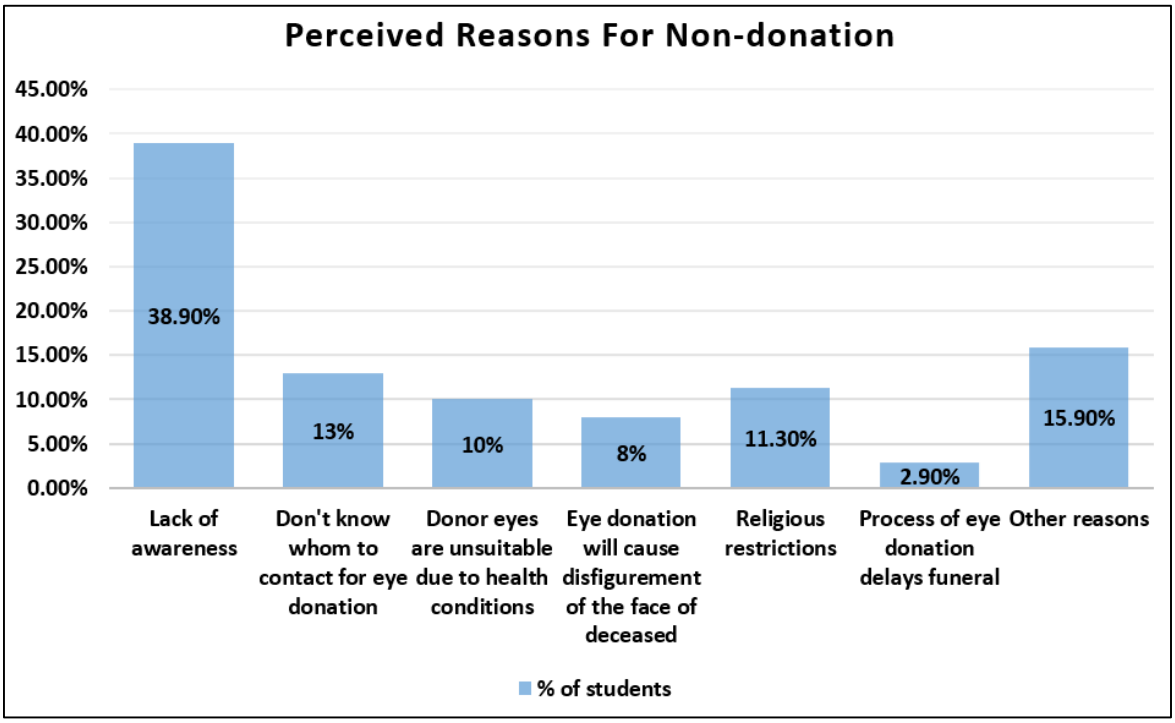

Figure 2: Perceived reasons for non-donation

126 (41.9%) students correctly knew that eye donation is acceptable from deceased of any age, 94 (31.2%) students correctly understood that eye donation is acceptable from deceased with refractive errors, 70 (23.3%) students correctly acknowledged that eye donation is acceptable from deceased who has undergone cataract surgery and 135 (44.9%) students correctly knew that identity of donor is not revealed to recipient at the time of corneal transplantation.

Only 120 (39.9%) students correctly acknowledged that patients with poor vision due to corneal diseases can benefit from eyes received from eye donation, however 178 (59.1%) students knew that only cornea and not the entire eye ball is transplanted to the recipient.

Figure 2 depicts the reasons felt by the students as to why people don't have inclination to donate eyes. Lack of awareness is the major reason perceived by maximum 117 (38.9%) students.

45.8% participants were ready to go for i.e. pledge their eyes after death, 12.6% participants were not ready to go for eye donation and 41.5% were not sure about going for eye donation.

Figure 3 depicts as to what students feel should be done to increase eye donation. Majority of them felt increase in campaigning in conventional and social media will encourage more people to do eye donation.

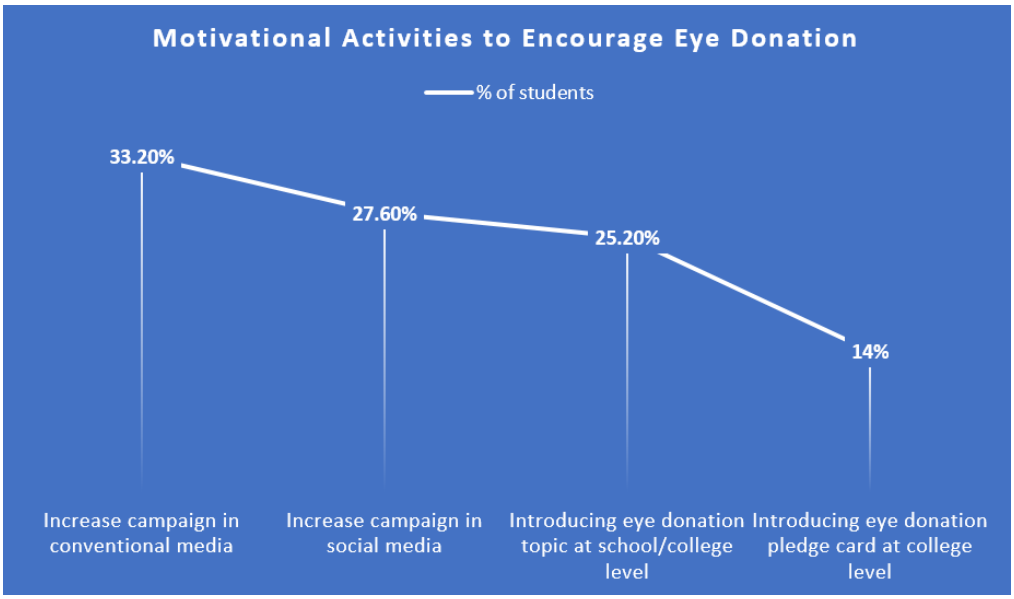

Figure 3: Motivational activities to encourage eye donation

There was no difference in responses given be males and females and both 1st and 2nd year students don't have ophthalmology in their curriculum, their patterns of knowledge and behaviour were similar.

Table 2: Comparison of results of our study with various similar published articles

	Current study	Gupta et al.[9]	Chowdhury et al[10]	Lal et al.[11]	Dodia et al.[12]	Sharma et al.[17]	Sadana et al.[18]	Singh et al.[19]	Dhaliwal et al.[20]
Awareness about eye donation (%)	95%	96.8%	95.6%	97.9%	-	99.3%	-	-	-
Understanding that eyes can be donated with near relative's consent (%)	34.9%	-	-	-	46%	-	-	-	-
Knew eye bank as the correct contact place for eye donation (%)	29.9%	-	-	-	-	-	26%	27.2%	-
Knew the ideal time of </= 6 hours of death for eye donation (%)	21.9%	-	69%	-	-	-	-	-	-
Aware about confidentiality of donor identity to recipient (%)	44.9%	-	-	-	64%	-	-	-	-
Knew that cornea is the part transplanted (%)	59.1%	-	70%	-	47%	-	-	-	-
Perceived lack of awareness as the most common reason for less donation (%)	38.9%	-	-	87.5%	-	-	-	-	-
Behavioural inclination to donate eyes (%)	45.8%	-	42.6%	-	-	-	-	-	87.8%

4. Discussion

Corneal blindness can be curbed by doing corneal transplantation which depends on eye donation and corneal collection. So, to augment eye donation rates, there is a need to assess the understanding, beliefs, and behaviour pattern of the public towards eye donation and then to frame an action plan on how to amplify the rates of eye donation. Well-informed doctors can motivate the families for eye donation of deceased.

Our study showed that almost all students were aware of eye donation (95%), and these results are in sync with other Indian studies as shown in second row of **Table 2**. Comparison of analysis of answers to other questions are shown in subsequent rows in **Table 2**.

Knowledge about ideal time of eye donation is significantly higher in study done by Chowdhury et al compared to our study and willingness to donate eyes was much higher in study done by Dhaliwal et al. These are two results of our study which are contradicting with other studies whereas other results are in sync as shown in **Table 2**.

Since the study done by Dhaliwal et al. was done in 2002, over a period of 22 years, beliefs of next generation of students would have changed leading to difference i.e. reduction in their willingness to donate eyes.[20] However, this reduction is of concern to us as more awareness is what is required to amplify rates of eye donation and keratoplasty.

According to this study, increased campaigning in social media, introducing eye donation as topic in school/college syllabus and introducing pledge card at school/college level can increase eye donation. So, the requirement for the use of mass media to create eye donation awareness in society must be optimized. Other actionable recommendations can be integrating eye donation topic into community medicine subject of medical curriculum from 1st MBBS itself and conducting awareness workshops by ophthalmology teachers in medical colleges can be useful to increase awareness about eye donation. Also, targeted awareness campaigns addressing some commonly prevailing misconceptions like eyes can be donated even if one has undergone cataract surgery can be effective.

Also, relatives can add that a deceased person is an eye donor or organ donor in their obituary which will help in increasing knowledge about eye donation in general public. According to the study done by Parija S. et al, “There can be an integrated chapter on organ and eye donation integrated into the tertiary education curriculum as is done in Germany. Another approach was to train medical students to give lectures to high schools and colleges about organ and tissue donation as is done in Hungary.”[3] According to the study done by Nemivant et al, the reasons for unwillingness to donate eyes can be culture specific issues and beliefs and also the fear of illegal trade in organs.[16] Positive reinforcement such as government or private initiatives will drive behaviours that will help to foster an organ donation culture.[14]

In the year 2013-14, Gujarat and Tamil Nadu were the only states who surpassed their eye donation targets and Tamil Nadu still continues to be among top leading states in India as far as number of eye donations are concerned however, Gujarat is in middle order in the ranking list for eye donation. Still, it is doing better than many other Indian states but to achieve better targets and to augment eye donation and keratoplasty numbers further in Gujarat, awareness and understanding of mass population should be increased for which medicos can be helpful. Hence, this study was done and results were analysed and discussed. In addition, if we are successful in raising awareness and increasing eye donation numbers in Gujarat, such models can be implemented in other states of India also. So, this study is our small, humble effort to assess awareness among medicos and if we can help increase eye donation and corneal transplants, we will be obliged and feel privileged.

5. Limitations

This study was done in only one medical college of Gujarat. Moreover, 3rd MBBS students were excluded from the study, so generalizability of this study is limited. We need survey of medical students from multiple medical colleges to have better understanding about their beliefs and behaviour patterns regarding eye donation. In addition, this data is self-reported so there can be a potential response bias though we have tried to report data as unbiased as possible.

6. Take Home Message

What we already knew was that eye donation awareness is inadequate among medical students, what we are adding by this study is how much inadequate it is and the reasons for inadequateness. Also, some measures like incorporating eye donation as a chapter in medical curriculum is already being implemented, but other suggestions like including it in high school curriculum, including that a person is an eye donor in obituary note are the new ones which can be emphasized upon.

7. Conclusion

The study demonstrates significant gaps in knowledge about eye donation procedures and resources, even among medicos, and more efforts are required for imparting knowledge to our medical students, who in turn will then transfer it to the population, resulting in change in their behavioural pattern leading to increased eye donation and a greater number of keratoplasties and thus reduction in corneal blindness.

8. Source of Funding

None.

9. Conflict of Interest

None.

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