

**Original Article**

# AWARENESS AND KNOWLEDGE ON EYE DONATION AMONG STUDENTS AT BHOPAL

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## ABSTRACT

**Background:** Visual rehabilitation by corneal transplantation remains the only treatment option for restoring sight in those who have corneal blindness. The requirement of donated corneas per year is 20 times the current procurement. As future health care providers the medical, paramedical and nursing students can significantly enhance the rate of eye donation by motivating patients and relatives for this noble cause.**Objectives:** To study the awareness and knowledge of medical, paramedical and nursing students towards eye donation.**Materials and Methods:** A cross-sectional study was conducted using a pre-structured, pre-tested questionnaire to solicit information from medical, nursing and paramedical students of People's University at Bhopal.**Results:** Out of 400 students who participated in this study, 98% were aware about eye donation but less than half of them (46.75%) were willing to donate their eyes. Most of the students (94%) did not know about any eye bank in India and only 39.7% of students knew that eye should removed within 6 hours of death. Knowledge of the fact that cornea is removed and grafted was found in 48.5% of them. A remarkable number of students (68.5%) felt it necessary to obtain the consent of family members before pledging eyes. The medical, paramedical and nursing students differed significantly in their knowledge.**Conclusion:** The results of this study indicate that although awareness regarding eye donation is high, there is lack of knowledge and motivation related to eye donation.**Keywords:** eye donation, students, medical, paramedical, nursing, awareness, knowledge, corneal transplantation

## INTRODUCTION

Corneal diseases constitute significant causes of visual impairment and blindness worldwide, especially in developing countries.<sup>1,2</sup> Corneal blindness accounts for 0.9% of the blindness in India.<sup>3</sup> Corneal transplantation offers the potential for sight restoration to those who are blind from corneal diseases. The number of patients waiting for corneal transplantation is growing due to insufficient number of eye

donations in India. Sri Lanka and USA are major donors of cornea for many countries including India because procurement of local corneas is low.<sup>4</sup> India is home to 23.5% of the world's blind population out of which 0.9% is due to corneal blindness.<sup>3,5</sup> There is a large gap between demand and supply because there is such a low awareness about how easy and noble eye donations are.<sup>6</sup>

Eye donations are dependent on people willing to pledge their eyes for donation and on the relatives to honor that pledge upon death of the person. This study therefore has assessed the awareness of the respondents regarding the importance of the consent of family members before pledging one's eyes, which has not been done in other studies.<sup>7,8,9,10</sup>

There is a paucity of such studies on the subject in Bhopal region which has a number of students pursuing various professional courses. The previous studies were conducted on students of medical and nursing courses separately on a relatively lesser number of students.<sup>7,8,9</sup> This study was therefore undertaken to assess the awareness, knowledge and attitude of four hundred students studying degree courses in Medicine, Nursing, Laboratory Technology and Physiotherapy on eye donation in People's University at Bhopal. The students of medical, nursing and paramedical streams were chosen because they are the future health care providers and hence can make a difference to the rate of eye donations by counselling the patients and their relatives.

## MATERIALS AND METHODS

Out of 400 undergraduate students who participated in the study, 132 were in the 7<sup>th</sup> semester of MBBS, 190 female students in the

first year of Nursing and 76 in the first year of Lab Technology and Physiotherapy (BMLT & BPT) courses in the People's University at Bhopal. All of them were more than 17 years of age. They were assessed on their awareness and knowledge regarding eye donation using a standard predesigned and pretested closed ended questionnaire. Students pursuing BMLT and BPT courses were grouped as paramedical. This study was conducted by the Department of Community Medicine in consultation with the department of Ophthalmology over a period of three months from January to March 2011. The purpose of this study was explained to all the students present in the class before obtaining their verbal consent. The questionnaire was administered to the students after finishing the teaching session. Students were told to write and tick the options for the questions mentioned in the questionnaire. All the students present in the class at the time of distribution of questionnaire responded. No response, more than one response, and wrong response to the name of eye bank was considered as "don't know". The students' responses to the questions were analyzed using SPSS version 17.0.

## RESULTS

Table 1 shows the awareness about eye donation whereas Table 2 reflects the knowledge regarding eye donation.

**Table 1: Awareness on eye donation**

| Responses  | Medical<br>n = 132 | Paramedical<br>n = 78 | Nursing<br>n = 190 | Total<br>n = 400 |
|--|--------------------|-----------------------|--------------------|------------------|
| Eyes can be donated                              | 132 (100)          | 76 (97)               | 185 (97)           | 393 (98)         |
| Willing to donate eyes                           | 65 (49.2)          | 34 (43.5)             | 88 (46.31)         | 187 (46.7)       |
| Consent of family members required               | 96 (72)            | 45 (59.2)             | 133 (70)           | 274 (68.5)       |
| Willing to donate close relative's eyes          | 42 (31.8)          | 17 (21.79)            | 29 (15.26)         | 88 (22)          |
| Eye hospital/bank is approached for eye donation | 83 (62.8)          | 45 (57.6)             | 128 (67.3)         | 256 (64)         |
| Specialist removes the eye from the donor        | 90 (68.1)          | 40 (51.2)             | 83 (43.6)          | 213 (53.2)       |
| Name of an eye bank in MP/India                  | 16 (12.1)          | 3 (3.8)               | 5 (2.6)            | 24 (6)           |

**Table 2: Knowledge about eye donation**

| Responses  | Medical<br>n = 132 | Paramedical<br>n = 78 | Nursing<br>n = 190 | Total<br>n = 400 |
|--|--------------------|-----------------------|--------------------|------------------|
| Living person cannot donate his eyes                   | 76 (57.7)          | 35 (44.8)             | 91 (47.8)          | 202(50.5)        |
| Eyes should be removed within 6 hours after death      | 83 (62.8)          | 17(21.7)              | 9(31)              | 159(39.7)        |
| Eyeball is removed from the donor                      | 27 (20.4)          | 28(35.8)              | 26(13.6)           | 81(20)           |
| Cornea is removed from the donor                       | 102(77.2)          | 16 (20.5)             | 80 (42)            | 198 (49.5)       |
| Cornea is transplanted from the donor's eyes           | 102 (77.2)         | 20 (26)               | 72 (37.8)          | 194 (48.5)       |
| Eyes can be stored for 24 hours before transplantation | 4 (3)              | 4 (5.1)               | 26(13.6)           | 34 (8.5)         |

Overall the awareness about the existence of practice of eye donation was high (98%) among the students. But not even half of them (46.75%) were willing to donate their eyes and only 22% of them were willing to donate their close relative's eyes. The consent of family members is necessary before pledging eyes was known to 68.5 % of the students. Only 53% knew that eye is removed by an eye surgeon. Majority of them (64%) knew whom to approach for donating eyes. Almost half of the students didn't know that eyes cannot be donated by a living person.

Only 40% knew that eyeball should be removed within six hours after death. Cornea is removed separately and is used for grafting was known to only half of them. Most of them (94%) didn't know the name of any eye bank while only 3% knew how long the donated eyes can be stored before transplantation. Overall, the awareness and knowledge of medical students was better than nursing and paramedical students. The difference of knowledge and awareness between three groups of students was statistically significant. (Table 3)

**Table 3: Comparison of awareness and knowledge between students**

| Response  |         | Medical V/S<br>Paramedical | Medical V/S<br>Nursing | Paramedical V/S<br>Nursing |
|---|---------|----------------------------|------------------------|----------------------------|
| Willing to donate close close relatives' eyes             | Z Value | 1.625                      | 3.433                  | 1.2130                     |
|   | P Value | 0.104                      | <b>0.0006*</b>         | 0.2251                     |
| Specialist removes the eye from the donor                 | Z Value | 2.413                      | 4.503                  | 1.127                      |
|   | P Value | <b>0.0150*</b>             | <b>&lt; 0.0001*</b>    | 0.2597                     |
| Name of eye bank  | Z Value | 2.2912                     | 3.189                  | 0.486                      |
|   | P Value | <b>0.022*</b>              | <b>0.0014*</b>         | 0.6267                     |
| Willing to donate close relative's eyes                   | Z Value | 1.6251                     | 3.4334                 | 1.2131                     |
|   | P Value | 0.1041                     | <b>0.0006*</b>         | 0.2251                     |
| Specialist removes the eye from the donor                 | Z Value | 2.4134                     | 4.5036                 | 1.1271                     |
|   | P Value | <b>0.0158*</b>             | <b>0.0001*</b>         | 0.2597                     |
| Eyes should be removed within 6 hours                     | Z Value | 6.5066                     | 5.8898                 | 1.6095                     |
|   | P Value | <b>&lt; 0.0001*</b>        | <b>&lt; 0.0001*</b>    | 0.1075                     |
| Eyeball is removed from the donor                         | Z Value | 2.3693                     | 1.5761                 | 3.6966                     |
|   | P Value | <b>0.0178*</b>             | 0.1150                 | <b>0.0002*</b>             |
| Cornea is removed from the donor                          | Z Value | 9.6390                     | 6.8605                 | 3.6842                     |
|   | P Value | <b>&lt; 0.0001*</b>        | <b>&lt; 0.0001*</b>    | <b>0.0002*</b>             |
| Cornea is transplanted from the donor's eyes              | Z Value | 8.2598                     | 7.7454                 | 1.9288                     |
|   | P Value | <b>&lt; 0.0001*</b>        | <b>&lt; 0.0001*</b>    | 0.0538                     |
| Eyes can be stored for 24 hours<br>before transplantation | Z Value | 0.7199                     | 3.6489                 | 2.4039                     |
|   | P Value | 0.4715                     | <b>0.0003*</b>         | <b>0.0162*</b>             |

**Table 4: Comparison of awareness and knowledge on eye donation between Indian and Malaysian Medical Students**

| Responses                                       | Present study<br>(n = 132) | MK Bharty <sup>4</sup><br>(n = 103) | Singh <sup>9</sup><br>(n = 180) | Dhaliwal <sup>7</sup><br>(n = 49) |
|---|----------------------------|-------------------------------------|---------------------------------|-----------------------------------|
| Living person cannot donate his eyes            | 76(57.5)                   | 34(33)                              | 179 (99.4)                      | 39 (79.6)                         |
| Willing to donate own eyes                      | 65(49.2)                   | 34(33)                              | 157(87.2)                       | 43 (87.8)                         |
| Willing to donate close relative's eye          | 42(31.8)                   | 38(36.9)                            | --                              | 37 (75.5)                         |
| Do not know about any eye bank                  | 116(87.8)                  | 98(95.1)                            | 16(32.6)                        | --                                |
| Whole eyeball/ cornea is removed from the donor | 129(97.7)                  | 69(67)                              | --                              | 42 (85.7)                         |
| Cornea is used for transplantation              | 102(77.7)                  | 32(31.1)                            | 155(86.1)                       | 49 (100)                          |
| Donor eye can be stored upto 24 hours           | 4(3)                       | 13(12.6)                            | --                              | 31 (63.3)                         |

## DISCUSSION

Ocular trauma and corneal ulceration are significant causes of corneal blindness that is often underreported but may be responsible for 1.5-2.0 million new cases of monocular blindness every year.<sup>11</sup> India is now home to the world's largest number of blind people.<sup>6</sup> Of the 37 million people across the globe who are

blind, over 15 million are from India. What's worse, 75% of these are cases of avoidable blindness, thanks to the country's acute shortage of transplant surgeons and donated eyes for the treatment of corneal blindness. While India needs 2.5 lakhs donated eyes every year, the country's 109 eye banks (five in Delhi) manage to collect a maximum of just 25,000 eyes, 30% of

which can't be used.<sup>12</sup> Cost for donor cornea is prohibitive due to the lack of local donors which can be attributed to the lack of national awareness on corneal transplantation and eye donation.

Although 98% of the total students in our study had heard about eye donation previously, only 46% of them were willing to pledge their eyes for donation, and merely 22% of them were willing to donate their relatives' eyes which is less than the previous studies which were done on a lesser number of students.<sup>7,8,9</sup> The willingness to donate eyes is much less (46.31%) among nursing students as compared to that (85%) at Bangalore.<sup>8</sup> One of the reasons why students were more willing to donate their eyes than their close relative's eyes could be that they felt they don't have the right to pledge their relative's eyes without their consent. Cornea is transplanted from the donor eye was known to 48.5% which is higher than Malaysian University students.<sup>4</sup> In a study by Manjunath S Nekar et al., 62.2% thought that whole eyeball is transplanted to restore vision.<sup>10</sup> The whole eye removed from the donor can be stored in the refrigerator (moist chamber technique) upto 48 hours before transplantation, while the corneo-scleral button taken from the donor eye and preserved in Optisol medium can be stored upto 14 days before transplantation.<sup>4</sup> In this study only 8.5% of them knew that the donor eye can be stored upto 24 hours before transplantation which is less as compared to 11.5% in the study of MK Bharty.<sup>4</sup>

Knowledge regarding the number of hours after death within which eye should be removed for donation was poor (39.7% )in this study as compared to college students at Hubli.<sup>10</sup> Among nursing students, 31% knew correctly the ideal time for donation as compared to 38% in the study by Gupta A.<sup>5</sup> Knowledge on this issue was much better (62%) among medical students in this study than medical students in a Malaysian University (31%).<sup>4</sup> The prevalence of awareness on eye donation(98%) is much higher than that (73.8%) reported in an urban population in India, as expected.<sup>13</sup> The awareness and knowledge on eye donation and the willingness to become eye donors appears to be much better among medical students in India than medical students in Malaysia.(Table 3) Only 57.5% of medical students knew that eye can be donated only after death which is much less than 99% and 79% reported by Singh<sup>9</sup> and Dhaliwal<sup>7</sup> among the medical students at Delhi,

96.8% among nursing students at Bangalore<sup>8</sup> and 94% among the college students at Hubli.<sup>10</sup> In Nigeria 95 out of 183 ( 72.2% ) graduating (final year) medical students didn't know that eyes can be removed only from a dead donor.<sup>14</sup> Similarly the knowledge that cornea is used for transplantation is much higher among Indian medical students than Malaysian medical students.(Table 3)

The name of an eye bank nearby was known to only 12% of medical students and 6% of the total number of students in this study which is contradictory to the study of Manjunath et al who have reported that 74% of the college students at Hubli knew about eye banks in their surrounding.<sup>10</sup> The functions of eye banks are the collection, processing, storage and distribution of donor eyes. The general public is aware that living people are donating kidney and liver to their relatives who are in need of them. In this context, the students were asked to respond to the question "Can eyes be removed from a living person for donation?" Surprisingly, many of the students (152, 38%) answered 'yes'. To the best of our knowledge, there is no law in any country which permits the removal of an eye from a living person (relative or other person) for donation even with the person's consent. The laws in most countries including India state that even if the person has pledged, while alive, the eyes or corneas cannot be removed from the dead body unless the next of kin or relative gives consent for the donation of eyes. The knowledge of Indian medical students is better (58%) in this regard in comparison to Nigerian medical students, 72% of whom didn't know that eyes can be donated only after death<sup>14</sup>. Eye cannot be donated by a living person is known to only 48% of the nursing students in this study which is much less than that (96%) among their counterparts at Bangalore.<sup>8</sup>

A majority of the students in this study (68%) feel that consent of the family members is necessary before pledging eyes. The previous studies have not assessed the awareness in this regard.<sup>7,8,9,10</sup>

## CONCLUSION

The awareness and knowledge of medical, nursing and paramedical students is poor at Bhopal. This indicates a higher level ignorance on eye donation in other sections of the society.

Further studies are needed to elicit the factors which prohibit people from eye donation in this area so that behaviour change communication is effective in this respect.

## RECOMMENDATION

To increase the level of awareness and knowledge of people on eye donation, more health education about eye diseases, eye donation and corneal transplantation is needed. This can be achieved by educating practicing doctors as well as the students who are the future health care providers on the importance of eye donation and benefits of corneal transplantation coupled with their training to counsel and motivate the relatives of patients for eye donation. In addition to this, enhanced utilization of the mass media to increase the coverage of education on eye care and eye donation alongwith eye donation campaigns will a help to increase the frequency of eye donation.

Education pertaining to eye donation should also be given to the students during their secondary school education.

## ACKNOWLEDGEMENT

The authors express their sincere thanks to all the students for sparing their time to participate in this study

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