Original Article

Awareness Regarding Eye Donation among Doctors, Students, and Paramedics at a Tertiary Care Teaching Hospital

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ABSTRACT

Introduction: In the sub-continent, there is a huge discrepancy between the cornea collected and the ever-increasing demand. Lack of awareness, faulty perceptions, and unwillingness to donate corneas are the major hurdles.

Objectives: To assess the level of awareness among doctors, students, and paramedics in a teaching hospital.

Materials and methods: An analytical cross-sectional, pre-tested, study design assessed the awareness, knowledge, and attitude among health care workers (medical students, nurses, doctors, and paramedics) in the context of eye donation through a administered self-administered semi-structured questionnaire.

Results: In our study, 692 (57.7%) of the respondents were aware that the ideal time for donation was within six hours of death. Our study revealed that 875 (72.9) of the respondents were willing to donate their eyes; out of these 305 (25.4%) were MBBS students and 223 (18.6%) were nursing students, (Chi-square tests, $p < 0.001$). Six-hundred and twenty-five (52.1%) respondents knew that the nearest eye bank should be contacted if they or any of their family members wished to donate their eyes. However, only 90 (7.5%) of the respondents' family/ relatives had donated his/her eyes. A significant association between knowledge of eye donation and the age, gender, religion, or marital status and knowledge of eye donation of participants was observed.

Conclusion: The study highlights the need for creating awareness about eye donation among doctors, medical students, and paramedics, who can be an effective channel for planning, educating, and motivating the public to pledge for eye donation.

Key words: Awareness; corneal blindness; eye donation; knowledge; perception.

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INTRODUCTION

Blindness is one of the major public health problems in developing countries like India. Cataract and corneal diseases account for the majority of cases of blindness in the subcontinent (Steinmetz, 2021).

According to the World Health Organization (WHO), there are about 1.2 million corneal blinds in India; to this blindness pool, about 25000–30000 patients are added each year (Gupta et al., 2018). A population-based study in North India reported that the burden of corneal blindness was 0.12% (Mukhija et al., 2020). It has been reported that nearly 90% of the global cases of ocular trauma and corneal ulceration leading to corneal blindness are in developing countries(Dandona and Dandona, 2003).

An epidemiological study conducted in rural India (CORE study)reported that the main causes of corneal opacities and resulting visual impairment were post-surgical bullous keratopathy (46.2%), corneal dystrophies, degeneration (23.1%), and trachoma (15.4%), respectively (Mukhija et al., 2020).

In the year 2018-19, about 68406 corneas were collected in India despite having a million blind people awaiting corneal transplantation (survey, 2015-2019). So, there is a huge scarcity of donor corneas in the subcontinent and the waiting list of those seeking transplantation is huge.

Several factors can potentially influence eye donation like the availability of eye banks in vicinity, potential donors, and the cooperativeness of family members in retrieving eyes after the death of the donor (Rao and Gopinathan, 2009).

In certain regions in developing and economically weaker countries, relational ties, religious beliefs, cultural influences, family influences, body integrity, and previous interactions with the healthcare system are other potential factors influencing organ donation (Irving et al., 2012). Thus, there is an ardent need to create awareness about eye donation in our country. Undoubtedly, healthcare professionals, medical students, and paramedics can be an effective channel for planning, educating, and motivating the public to pledge for eye donation.

Our work aimed to assess the knowledge and attitude toward eye donation among doctors, students, and paramedics at a tertiary care teaching hospital. The idea behind the study was to use this information to create awareness among all those involved in healthcare so that they can further motivate the public for eye donation and help devise strategies to meet the needs of the community.

MATERIALS AND METHODS

This analytical cross-sectional study was done from 2020 September to 2020 December at a teaching hospital of Institute of Ophthalmology, Jawaharlal Nehru Medical College, Aligarh Medical University, Aligarh, Uttar Pradesh, India in the northern part of the Indian subcontinent. The study was approved by the institutional review board and the local Ethics committee (Ref. GSMCH/2021/IEC/Approval/051). A written informed consent was obtained from all participants based on the tenets of the declaration of Helsinki.

The study was conducted among the faculty, residents, MBBS students, nursing students,

and paramedics of our institute. Socio-demographic profile, awareness, knowledge, and attitude of all those involved in health care (medical students, nurses, doctors, and paramedics) in context of eye donation was evaluated through a self-administered semi-structured questionnaire. Participants were invited by e-mail to answer the questionnaire; this included questions regarding their beliefs of eye donation, their willingness to donate and general awareness of the donation procedure. A maximum of three e-mail reminders were sent. The participants were requested to answer all questions without revealing their identity. The queries of the participants (if any) were noted and clarified by an independent investigator, who was not a study investigator.

The aim was to estimate the prevalence of unknown parameter(s) from the target population using a random sample. Sample size was calculated using formula, $n = Z^2 * P (1-P)/d^2$.

In this formula, n is the sample size, Z is the statistic corresponding to level of confidence (standard normal variate), P is expected prevalence (that was obtained from previous study conducted by the researchers in our region/ country) and d is precision (corresponding to effect size).

According to a study conducted in Goa India, prevalence of willingness of donating eye was 27% (Lal et al., 2018). We preferred willingness over awareness for sample size calculation because the study was conducted in a medical school; it was presumed that most participants had some knowledge about eye donation. Considering precision error of 1.5%, the level of confidence aimed was 95%, the normal standard variate, Z=1.96, the estimated sample size was calculated to be 1200.

The inclusion criteria were doctors, medical students (allopathic and ayurvedic), nursing students, and paramedical staff at our teaching hospital. The exclusion criteria were age less than 18 years and those who refused to sign an informed consent.

Self-administered Questionnaire:

1. Which organs can be donated?
2. What is your source of information about eye donation?
3. What can be transplanted?
4. Within how much time eye should be removed for transplantation?
5. Are you willing to donate your eyes?
6. If not, then give reasons!
7. Have your kith or kin ever donated?
8. Whom will you contact in case you or any of your family members wish to donate eye(s) or want to register for it?
9. Has anyone in your family/ relatives donated his/her eyes?
10. Do you know about 'HOTA?'

To determine the practicability of the questionnaire, a pilot study was first done by administering the instruments on 50 health care workers. These participants were excluded from the main study.

Statistical analysis was performed using IBM SPSS Statistics for Windows, version 27 (IBM Corp., Armonk, N.Y., USA). Normally distributed data was expressed as mean ±SD. The data was expressed as median [25th -75th, IQR] when the assumption of normality was violated (Shapiro-Wilk test <0.05). Outliers were identified on visual inspection of the box plots. Association between two categorical variables was evaluated with Chi-square tests. A one- way analysis of variance (ANOVA) was used to determine whether there were any statistically significant differences between the means of two or more independent groups. All expected cell frequencies were greater than five. A p-value less than 0.05 was considered statistically significant.

RESULTS

Out of 1200 participants, 58 (4.8%) were faculty members, 141 (11.8%) senior residents, 419 (34.9%) MBBS students, 280 (23.3%) nursing students, and 302 (25.2%) para-medical staff, respectively (Table 1). The response rate was 85% among the medical students, 74% among the nursing students, 95% among the physicians and 65% among paramedical staff respectively.

The mean age of study participants was 29.3±2.1 (range, 24-46) years. The mean age of males did not significantly differ from females (independent t-test, p = 0.076). The mean age of health care providers (40±4.6 versus 29.3±2.5 years) was significantly higher (ANOVA, p = 0.001) than students and graduates, respectively.

Table 1: Demographic profile of the participants.

Parameters		n (%)
Age groups (in years)	20-30	1035 (86.2)
	30-40	156 (13)
	>40	9 (0.8)
Gender	Male	683 (56.9)
	Female	517 (43.1)
Type of residence	Urban	679 (56.6)
	Rural	521 (43.3)
Religion	Hindu	1044 (87)
	Muslims	156 (13)
Category of respondents	Faculty	58 (4.8)
	Medical students	419 (34.9)
	Nursing students	280 (23.3)
	Paramedics	302 (25.2)
	Senior residents	141 (11.8)

Table 2: What can be donated?

Organ	n (%)
Eyes after death	307 (25.6)
Blood before death	119 (9.9)
Blood before death, eyes after death	706 (58.8)
Blood before death, eyes before death	15 (1.3)
Blood before death, after death, eyes after death	20 (1.7)
Blood after death	21 (1.8)
Eyes before death	12 (1)
Total	1200 (100)

Table 3: What is your source of information about eye donation?

Source	n (%)
Health care professionals	407 (33.9)
Relatives/friends	278 (23.2)
Media	403 (33.6)
Awareness sheet	112 (9.3)
Total	1200 (100)

Table 4: What can be transplanted?

Organ	n (%)
Part of eye	567 (47.3)
Whole eye	245 (20.4)
Don't know	388 (32.3)
Total	1200 (100)

Table 5: Within how much time eye should be removed for transplantation?

Time	n (%)
0-6 hours after death	692 (57.7)
6-24 hours after death	167 (13.9)
Don't know	341 (28.4)
Total	1200 (100)

Table 6: Are you willing to donate your eyes?

Response	n (%)
Yes	873 (72.7)
No	327 (27.3)
Total	1200 (100)

Table 7: If no, then give reasons!

Reason	n (%)
Religious	65 (19.8)
Family problem	186 (57)
No reason	43 (13.1)
Disfigurement	8 (2.4)
Lack of knowledge	11 (3.3)
Eye problems	14 (4.3)
Total	327 (100)

Table 8: Have your kith or kin ever donated?

Answer	n (%)
Never	1054(87.8)
Blood	81 (6.8)
Eyes	14 (1.2)
Blood, eyes	19 (1.6)
Any other organ	18 (1.5)
Eyes, any other organ	14 (1.2)
Total	1200 (100)

Table 9: Whom will you contact in case you or any of your family member wishes to donate eye or want to register for it?

Answer	n (%)
Nearest eye bank	625 (52.1)
Nearest ophthalmologist	94 (7.8)
Nearest hospital	271 (22.6)
Don't know	210 (17.5)
Total	1200 (100)

Table 10: Has anyone in your family/ relatives donated his/her eyes?

Response	n(%)
Yes	90 (7.5)
No	1110 (92.5)
Total	1200 (100)

DISCUSSION

The present analytical, cross-sectional questionnaire-based study evaluated the level of awareness, knowledge, and perception regarding eye donation at a tertiary care teaching (allopathic, ayurvedic, and nursing) hospital in the northern part of the Indian subcontinent.

In this study, the mean age of study participants was 29.3±2.1 (range, 24-46 years). The mean age of males did not significantly differ from females (independent t-test, p = 0.076). The mean age of faculty members (40±4.6 versus 29.3±2.5 years) was significantly higher (ANOVA, p = 0.001) than students and graduates, respectively.

In the present study, 692 (57.7%) of the respondents were aware that the ideal time for donation was within six hours of death. A study by Priyadarshini et al. observed that only 4.34% participants were aware that eyes had to be donated within six hours of death. In contrast to the present study, that study was conducted in the rural population of south India and hence the difference in observation and the need for awareness regarding eye donation (Krishnaiah et al., 2004).

A study among first year medical students in Delhi observed that although 99.4% of students knew that eyes can be donated after death, but only 41.1% knew that the ideal time of donation was within six hours of death (Singh et al., 2007). Compared to the study among medical students where 50% knew the ideal time of eye donation and 32.8% of the nursing students the same (Schaeffner et al., 2004). Another study observed that 79.6% of the students knew that eyes can be donated after death and 63.3% knew about the ideal time of donation (Singh et al., 2012).

Current study observed that 875 (72.9%) of the respondents were willing to donate their eyes; out of these 305 (25.4%) were MBBS students and 223 (18.6%) were nursing students, (Chi-square tests, p <0.001). In contrast, 94.4% of the medical students in Delhi and 85.1% of the nursing students in Bangalore were willing for eye donation (Singh et al., 2007, Gupta et al., 2009). Comparing this data to the eye donation awareness among the general population will be relevant: a study conducted in a rural population of Andhra Pradesh observed that only 11.5% had knowledge about eye donation and only 32.9% of the subjects were willing for eye donation (Krishnaiah et al., 2004).

In the present study, 625 (52.1%) of the respondents knew that the nearest eye bank should be contacted in case they or any of their family members wishes to donate their eyes or want to register for it. However, only 90 (7.5%) of the respondents' family/ relatives have donated his/her eyes.

A significant association was found between knowledge of eye donation and age, gender, religion, or marital status of the participants. A study done in Singapore reported poor knowledge among youth regarding corneal donation and transplantation (Paraz et al., 2016).

In a study among medical students, 96% of students were aware of eye donation/corneal donation and only 67% of students were willing to donate his/her eyes (Singh et al., 2012). In another study among medical students in Delhi, 87.2% participants were willing for eye donation (Singh et al., 2007). In yet another study among the students of nursing showed that 85.1% were willing or had guaranteed to donate their eyes (Gupta et al., 2009).

Among studies on knowledge and perception of the youth on corneal donation, most of the studies we reviewed focused on medical and nursing students, which may give a skewed representation of knowledge among the youth (Gupta et al., 2009; Singh et al., 2007; Cantwell and Clifford, 2000 Dhaliwal, 2002).In 2002, Dhaliwal et al. reported that 79.6% of surveyed medical students were well aware of corneal donation from deceased donors and 87.8% were willing to donate corneas (Dhaliwal, 2002). Gupta and colleagues found a high percentage of nursing students in Bangalore (85.1%) who were willing to donate their eyes or were registered eye donors. These students also generally had fair knowledge of the corneal donation process, with more than three quarter of them being able to answer two knowledge questions correctly (Gupta et al., 2009). Similarly, a study done in 2007 by Singh and colleagues found that 87.2% of surveyed medical students reported their willingness to donate eyes in Delhi. However, less than half of those respondents were aware that eye donation should be done ideally within six hours of post death certification (Singh et al., 2007). Medical students are the future doctors and potential candidates to influence the masses. If they themselves lack knowledge or have misconceptions about eye donation, it is justifiable to conduct such studies in a medical college setting before reaching out to the general population.

According to the present study, 69.4% respondents were aware regarding storage of eyeballs prior to transplantation. A study by Bharti et al. observed that about 57.7% students were not aware regarding storage of donor eyes prior to transplantation (Bharti et al., 2009). Another study by Kumari (2016) showed that 40% of students knew where donated eyes were stored.

The attitude of medical professionals and nursing staff towards eye donation can also be expected to influence the donation rate. Hospital deaths are a good source of fresh tissue for treating corneal blindness, but hospitals fail to adequately exploit this resource.

This study had several limitations. It had a self-administered questionnaires-based study; self-administered surveys have low response rates as few people may be interested in responding to a mail without any incentive. The response rate among paramedics was only 65%. Second, it is difficult for a researcher to account for validity of the responses from self-administered surveys as respondents may not be 100% truthful with their answers.

CONCLUSION

We need to raise the eye donation awareness of the medical care providers simply because these are the people who can most effectively motivate the masses for eye donation activities. With the correct knowledge and attitude, health care professionals can contribute by creating awareness and motivating the public for eye donation while carrying out their routine hospital duty.

Awareness and knowledge and willingness to donate eyes among the doctors, medical students and paramedics regarding eye donation was not satisfactory and that needs to be resolved to improve donation rates. There is still scope for improvement since they still have some shortcomings in both knowledge and attitude such as confidentiality, the process of eye donation, distinction between pledging and actual donation, contraindications to eye donation and scepticism about the outcomes.

There is a need to encourage students and paramedics to pledge for eye donation so that we can bridge the gap between eye bank and donors. Therefore, developing strategies to increase specific areas of knowledge to overcome the obstacles is necessary to enhance donation rates.

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