

Knowledge, awareness and attitude of eye donation among non-clinical staff of a tertiary eye hospital in South India

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Purpose: This study aimed to evaluate the knowledge, awareness and attitude of eye donation among non-clinical staff of tertiary eye hospitals and to convey a positive attitude toward eye donation by enhancing their awareness and knowledge. **Methods:** An online cross-sectional study was conducted among the non-clinical staff from all centers of a tertiary eye care hospital across Tamil Nadu. Quiz link was emailed to non-clinical staff of all the centers. On completion of the quiz, the participants viewed their respective scores and the correct answers to all questions. This activity was presumed to subsequently improve their knowledge and clear up the myths on eye donation. **Results:** Two hundred twenty-eight non-clinical staff from 11 hospitals participated in the quiz. Mean age was 35.3 ± 9.8 years and 130 were female staff (57.05%). One hundred eighty-one participants (79.39%) scored over 50% of the total 17 queries. One hundred eighty-six (81.58%) and 142 (62.28%) participants scored over 50% in the awareness section and knowledge section, respectively. Eye bank volunteers (73, 32.02%) were the main source of information. Twenty-four (10.53%) had already taken pledge for eye donation and 175 (76.75%) were willing to pledge, 29 (12.72%) were not willing to pledge. Twenty-two out of these 29 (75.86%) had no specific reason for not pledging. Family, religious reasons, lack of clarity and fear were least cited reasons (13.79%). **Conclusion:** Non-clinical staff of an eye hospital are easily approachable and are expected to be more knowledgeable by the general public around them. They might act as primary motivators in raising awareness within their family, friends, relatives and neighbors.

Key words: Attitude, awareness, corneal transplantation, eye donation, knowledge, nonclinical staff

Corneal disease is one of the leading causes of blindness in developing countries like India. Nearly 6.8 million people in India are blind in at least one eye, and about one million are bilaterally blind.^[1,2] Corneal transplantation is the only solution to reduce corneal blindness. The source of the corneal transplant is obtained from voluntary or motivated public. But corneal donation depends on the willingness of people to pledge eyes for donation and also depends on the family member's consent to donate the pledged eyes. The current cornea procurement rate in India is a dismal 22,000 per year. Based on existing cornea utilization rates, it is estimated that 2.7 lakh donor eyes are required to perform 1 lakh corneal transplants per year—a 20-fold increase over existing eyes.^[3]

According to the Eye Bank Association of India, there has been approximately a 52% drop in corneal transplant due to the COVID-19 pandemic.^[4] India requires a minimum of two lakh eye donations annually against the average number of 45,000 per year. To create awareness and importance of eye donation and to encourage pledging among the common public, the government has introduced various programs. Hospital Cornea Recovery Program (HCRP) is one such program, aimed at the retrieval of corneal tissues from eligible and willing donors after death in hospital.

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Many observational and cross-sectional studies have been published to assess knowledge, awareness and attitude of medical students, nursing students, patients and caregivers.^[5-11] Many population-based cross-sectional studies among rural and urban adults have also been published to assess the knowledge and attitude toward eye donation.^[12-20] One study from Australia specifically reported the unwillingness of adults to donate eyes who visited the RTA office to renew their driving license,^[21] while another study from Ghana reported on the awareness and attitude of drivers and staff of the Driver-Vehicle and Licensing Authority.^[22] There is only one recently published article which documented the Awareness, knowledge and perception of non-clinical staff of an eye hospital in Amritsar regarding eye donation.^[23] Our study aimed to determine the knowledge and awareness of and attitude toward eye donation among non-clinical staff of a tertiary eye hospital in South India, and also impart to them the knowledge about eye donation through an online quiz.

Non-clinical staff were selected specifically for the reason that though they work in an eye hospital, the nature of their work, most of the time, did not directly relate to the care of eye disease or management. Therefore, it can be assumed that the level of understanding of eye donation awareness among

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the clinical and non-clinical staff of eye hospital may differ significantly. Educating non-clinical staff about eye donation will have a significant impact as this is a perfect subgroup and represents the public with diverse lifestyles and different socioeconomic backgrounds.

Methods

A prospective, hospital-based, online cross-sectional survey was conducted from 1 December 2021 to 3 December 2021. A questionnaire was prepared with the help of the manager of the eye bank and was validated by the director of the apex hospital. The study received approval from the Institutional Human Ethics Committee. Queries were developed in quiz format using Google Form. The questionnaire comprised of six sections: Section one consisted of queries on personal demographic details like age, sex, department, designation, work experience with the eye hospital, whether the hospital had an in-house eye bank; section 2 had queries on awareness on eye donation; section 3 on knowledge; section 4 on attitude; and section 5 and 6 had a single question each on the reason for not willing to take the pledge and recommendations for pledging. Knowledge and awareness questions carried a score of 1 each for correct answer and 0 for wrong answer [Annexure: Questionnaire].

Inclusion criteria

All non-clinical staff of various departments of the hospital including administration, lab, camp, marketing, management, etc. having email ids were included in the study.

Exclusion criteria

All clinical staff (including ophthalmologists, MLOP nurses, optometrists, eye bank managers, etc.), investigators and co-investigators of this study, those who were not willing to attempt the quiz and those who did not have email IDs (like sweepers, drivers, security guards, lift operators etc.) were excluded.

The link to the Google Form questionnaire was shared to all non-clinical staff through the official email group of administrators and managers of all hospitals. The quiz was closed for response after five days with two repeated reminders for those who had not answered and were considered as not willing to participate. After submitting, the respondents could view their scores and the correct the answers as well. This would make them learn the correct information about eye donation. Entry and exit time were also recorded.

Statistical analysis

The data collected in Excel format were analyzed using Stata version 14.2 (StataCorp, Texas, USA). Continuous data were presented with mean, standard deviation, minimum and maximum, while categorical data were presented as count and percentage. Comparison of categorical variables were done using Pearson’s Chi-squared test. A binary logistic regression was used to test the association between various demographic factors and the total score. Statistical significance was decided based on the *P* value less than 0.05.

Results

A total of 228 employees from eleven hospitals took part in the online survey. The mean age of the participants was 35.3 ± 9.8 years (range: 20–75) with 130 female (57.02%) and 98 male (42.98%) employees. Almost a third of the staff (70, 30.70%) had been with the hospital for more than ten years,

51 (22.37%) had been with the hospital for five to ten years, and 107 (46.93%) had been with the hospital for less than five years. Of the eleven hospitals, four had their own eye banks, 4 had only eye collection centers and three had neither eye banks nor collection centers. The departments reported by the participants were divided into two broad categories, namely “direct patient care” and “indirect patient care”. Departments such as the camp section, counselling, feedback, patient care, pediatric, pharmacy, etc., that work directly for patient care management were classified under direct patient care and departments such as sales, marketing, human resources, personal department, library, information technology, biostatistics, logistics, etc., that functions for administration of hospital staff were classified under indirect patient care. There were the same number of departments in both categories with 114 (50%). Similarly, the designation of staff was classified under five main headings, namely, administrative, managerial, professional/technical, support and maintenance staff. The distribution of staff across departments is shown in Fig. 1.

Table 1 describes the prevalence of awareness and knowledge of eye donation among non-clinical staff. Column (c) results from multiplying the participants’ score with the number of participants who answered correctly.

A large number of staff, say 198 participants (86.84%) were aware that eye donation did not mean replacing the entire eyeball, while 190 (83.33%) were aware that the eye could be enucleated at the donor’s house itself. One hundred eighty-four (80.7%) replied that people with cataracts could also donate their eyes. A total of 154 (67.54%) did not know that children’s eyes could also be donated. More than half of the respondents (144, 63.16%) were not aware that it was not possible to source or sell cornea via social media.

Knowledge of the ideal time for corneal removal after death was accurately reported to be within 6 hours by a maximum of 192 (84.21%) participants. 105 of the 192 (54.69%) direct patient service staff answered correctly and 87 of the 192 (45.31%) were indirect patient service staff. Additionally, more than five years of experience with this hospital was another factor influencing this ideal time knowledge compared to less than five years of experience.

In the knowledge section, the question “Steps to follow after informing eye bank staff for corneal procurement” has four

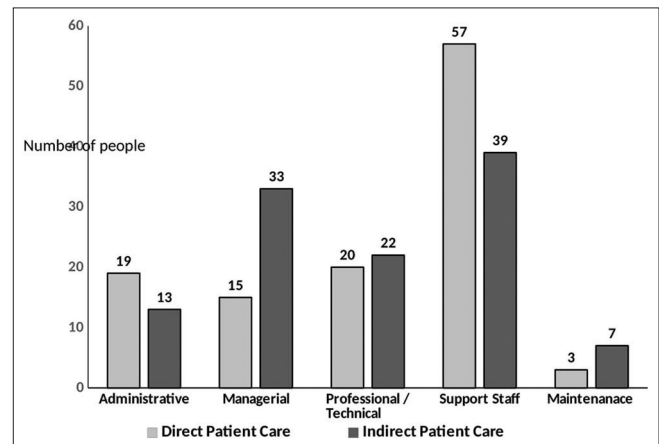


Figure 1: Distribution of non-clinical staff based on their designation across two departments (direct patient care and indirect patient care)

Table 1: Score Percentage

	No. of participants (a)	No. of questions (b)	Score obtained (c)	Maximum possible score (d) = (a)*(b)	Score percentage [(c)/(d)] *100
Awareness	228	8	1396	1824	76.53%
Knowledge	228	9	1196	2052	58.28%
Total	228	17	2592	3876	66.87%

options: (1) Turn off the fan; (2) Turn on the AC, if available; (3) Close the deceased's eyelids; and (4) Raise the deceased's head slightly with a pillow. One must tick all four options to answer correctly and to get a total score of 4. But only 62 participants (27.19%) were able to tick all options, while others chose to tick either one or a combination of two or three options.

"Which country is the world's leading eye donor?" was the knowledge question with the least number of right answers. India is the leading eye donor, according to over half of the employees (107, 46.93%). Only 89 employees (39.04%) identified Sri Lanka as the correct answer, and half of them were from direct patient service departments. Ten out of 228 participants (4.39%) thought that removing the eye caused facial disfigurement, 11 (4.82%) were worried that it would create ceremonial hindrances for the deceased, and a third (29.39%) thought that donating an eye would leave the eye socket hollow.

Eye bank volunteers were the primary source of information for 73 participants (32.02%), followed by friends, relatives or neighbors for 53 participants (23.25%). When asked if they would be willing to take an eye donation pledge, 175 employees (76.75%) replied yes, while 24 (10.53%) had already done and 29 (12.72%) said no. Twenty-two (75.86%) of the 29 employees who refused to accept the pledge said they had "no reason, no idea or [were] not interested", while the remaining 7 (24.14%) said they had family objection, were unaware of the process, were wearing power glasses or were religious.

The awareness section had eight questions and the knowledge section had nine questions. Each right answer received a score of 1 in both sections. The overall score was calculated by summing the scores of awareness and knowledge. The maximum achievable score for both sections was 17. The average of awareness section score was 6.12 ± 1.71 (range: 1–8). The average score in the knowledge section was 5.24 ± 1.97 (range: 1–9), and the total mean score for all 17 questions was 11.37 ± 3.19 (range: 3–17). The percentage of the scores so obtained in each section were then converted into percentages and categorized as "less than 50%" and "more than 50%" [Table 2].

A Chi-squared test to identify the association between categorized total score (<50%, >50%) and certain demographic variables such as age group, gender, duration of work, department, designation and the presence of an eye bank or collecting center on the premises was used. Significantly higher scores ($P = 0.001$) were observed in the middle-aged group (31–50 years) than the younger and older age groups. Gender had no significant effect on the score ($P = 0.69$). Those who worked in the eye hospital for fewer than five years scored lower than those who had worked for five to ten years or more, and the difference was statistically significant ($P = 0.000$). Those in direct patient service departments significantly outperformed than the staff of indirect patient service departments ($P = 0.005$). There was

Table 2: Scores categorized

(n=228)	Score ^a		Score <50%		Score >50% ^b	
	Mean±SD	Range	n	%	n	%
Awareness (Max score=8)	6.12±1.7	(1, 8)	42	18.42	186	81.58
Knowledge (Max score=9)	5.24±1.9	(1, 9)	86	37.72	142	62.28
Total (Max score=17)	11.37±3.2	(3, 17)	47	20.61	181	79.38

no statistically significant association between designation and total score category ($P = 0.620$). Presence of eye bank or collection center on site had a significant impact on the total score category ($P = 0.001$). The staff who worked in a hospital that had its own eye bank or collection center scored higher.

A multivariate logistic regression analysis between relevant demographic variables and the better score was done [Table 3]. Over five years of working experience in an eye hospital had an impact on eye donation awareness. Employees in direct patient service departments had 4.35 times more knowledge (95%CI 1.97–9.61) than employees of indirect patient service department. Furthermore, having an eye bank or collection center in the hospital campus had a significant impact of 6 times higher knowledge scores (95%CI 1.65–21.79) than those hospital staff who did not have an eye bank or collection center on campus.

Discussion

Corneal transplantation, also known as corneal grafting, is a surgical replacement of a portion or the entire cornea with donated tissue. In our study, 195 employees (85.53%) were aware that donated eyes could be used to replace a blind person's cornea. The presence of an eye bank on campus, and experience of more than five years had a significant association with this knowledge. This percentage was comparatively higher than in the studies conducted among medical, paramedical, nursing and allied health services students throughout India.^[5,16,24] A study conducted in Australia among individuals entering the RTA branch yielded a similar result of 86%, whereas the one conducted in rural areas of Andhra Pradesh recorded a low of 2.90%.^[14,21] Studies done among medical and environmental students in Nigeria and Malaysia revealed a lower percentage of 20.90% and 25.25%, respectively.^[25,26] A study conducted by Milan Rai *et al.*^[23] among non-clinical staff at Amritsar recorded 37.56%.

In our study, awareness was 76.53% and knowledge was 58.28%. In comparison to previous published studies, this percentage is a little lower. The reason may be due to the difference in definitions, tools used to assess awareness and

Table 3: Multivariate logistic regression analysis

	51% + (n=181)	Total	P	OR (95% C.I)
Age:				
<30 years	53 (66.2)	80		1.0
31-50 years	115 (85.8)	134	0.08	2.1 (0.91-5.0)
51 + years	13 (92.9)	14	0.1	7.5 (0.66-85.7)
Duration of Work				
<5 years	71 (66.3)	107		1.0
5-10 years	47 (92.2)	51	0.008	5.1 (1.54-16.9)
10 + years	63 (90.0)	70	0.024	3.3 (1.17-9.4)
Department				
Indirect Patient Service	82 (71.9)	114		1.0
Direct Patient service	99 (86.8)	114	0.000	4.3 (1.97-9.61)
Eye bank/Collection Centre				
Not present	5 (38.5)	13		1.0
Present	176 (81.8)	215	0.006	6.0 (1.65-21.79)
Total	181 (79.4)	228		

knowledge, different population and set-up. All of the studies that revealed high awareness (greater than 80%) were done among health care students or professionals in India.^[5,6,27,28] A few population based studies, stake holders, health workers, trained students, and patient attendants-based studies showed a high awareness percentage (80.6%–95.6%).^[9,11,16] Studies conducted in Singapore and Malaysia had reported similar awareness percentages.^[26,29]

Timely procurement of corneas proves its utmost usage. The ideal time for corneal procurement is a maximum of six hours from the time of death. This time duration of procurement was correctly answered by 192 participants (84.21%). Only 34.37% of the participants in Milan Rai *et al.*'s^[23] study were aware of the ideal time of corneal procurement. Studies conducted among medical, paramedical and nursing college students revealed that more than 50% were aware of the time to donate,^[5,24,27] whereas studies conducted among the general public in rural Pondicherry, urban slum of New Delhi and participants of a community outreach revealed lower percentages,^[9,13,18] with the exception of Ronanki *et al.*'s^[16] study that revealed 64.8% were aware of the right time of corneal procurement and the participants were teachers, trained students, health professionals which could also be a reason for the higher percentage.

Children's eyes could also be donated, according to 154 employees (67.54%) of our study. The presence of eye bank or collection center on campus, as well as increasing years of experience in the eye hospital contribute significantly to this awareness.

In our study, 190 participants (83.33%) were aware that eyes could be retrieved at the donor's residence, and this awareness percentage increased with increase in age of the participants. This was the highest percentage compared to the studies that reported 32.9% and 52.9%, conducted among adults visiting the RHTC of rural Pondicherry and adult residents of West Bengal, respectively.^[9,28]

Facial disfigurement is one among the myths that most people mention as a cause for not pledging for eye donation. In our study, over one-third of the staff (88, 38.60%) believed

that removal of eyes caused facial disfigurement, hollow eye sockets and difficulty in performing rituals, etc.,. Some Indian studies, especially from North India, reported fear of facial disfigurement as a reason for not donating eyes.^[5,16,19,24] Studies from outside India also reported the identical cause.^[15,17,21,25] Saudi Arabia had the highest percentage of 82% that reported deformity as the cause for not pledging eye donation, although the study group comprised of medical and non-medical professionals.^[20]

The source of information about eye donation in our study was mainly the eye bank volunteers (32.02%) followed by friends, relatives, or neighbors (23.25%) among others. However, in the majority of Indian and international studies, the main source of information was the mass media (TV, radio, newspaper, social media).^[9,11,14,16–18,22-24,27,28,30-32] Only Priyadarshini *et al.*^[13] cited publicity campaign (40.86%) as the primary source. Similarly Acharya *et al.*^[19] identified health care facility (34.96%) as the primary source of information on eye donation.

Among the 228 non-clinical staff, 175 (76.75%) were ready to take pledge for eye donation. Only 29 (12.72%) were not willing and there was no definite reason. Reasons like family problems, religion, and lack of clarity were least cited. If properly motivated, the unwilling 12.72% can be turned to have a positive attitude toward donation. Half of those who were unwilling were between the ages 31 and 50 years. Nineteen out of 29 participants (65.52%) were under indirect patient service and 10/29 (34.48%) were support staff with nearly half of them having been working for less than five years with the hospital. Those who had already pledged (24, 10.53%) were working in a hospital that had either an eye bank or eye collection center. And of those who did not want to donate, 28/29 (96.55%) were working in a hospital where neither an eye bank nor collection center was present. Newly hired employees at this hospital went through an introductory induction program that involved an eye bank visit. This could possibly be the reason for the disparity in eye bank and non-eye bank annexed hospital staff's knowledge and awareness. Twenty-two out of 29 (75.86%) who refused to donate were in the category of above 50% total score, indicating that, in addition to knowledge and awareness,

sufficient motivation is required for more corneal procurements to occur in the future.^[33,34]

Time duration to complete the quiz was also accounted in this study. The average time taken by the participants of the study to complete the form was 8.22 ± 7.98 minutes ranging from 1 minute to 53 minutes. 80.70% employees completed the quiz in less than 10 minutes, while 19.30% took more than 10 minutes. No significant difference was found between <10 minutes and >10 minutes with respect to total score. Those who took more than 10 minutes to finish the quiz were female (27.69%), supportstaff (34.38%) and maintenance employees (30%).

A drawback of the study is the sample size. Among 596 non-clinical staff working at various centers of the hospital, the modest response may be due to limited time set for data collection to avoid discussion or dissemination of queries. According to our findings, more eye banks or collection centers are needed to raise awareness about eye donation.

Conclusion

Non-clinical staff of an eye hospital are easily approachable and are expected to be more knowledgeable by the general public around them. They might act as primary motivators in raising awareness within their family, friends, relatives and neighbors.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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