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Knowledge and attitudes regarding eye donation and corneal transplants in Saudi Arabia: A cross-sectional study

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Abstract
Background: Corneal transplantation is a method of choice for treating corneal blindness, a condition that leads to total vision loss. Saudi Arabia faces key challenges because a large number of people are waiting for corneal transplantation. The purpose of our study is to assess the knowledge and attitudes of the Saudi population regarding eye donation and corneal transplants.
Methods: A cross-sectional study was conducted among 681 male and female in western region of Saudi Arabia (Makkah, Jeddah, and AL-Madinah cities) during July-October 2016. A pre-designed questionnaire was translated into Arabic and data were collected via structured interviews. We selected population consecutively. The data were analyzed using software SPSS ver. 23. Chi-square test of significance and t were used, where appropriate. P value (<0.05) was considered statistically significant.
Results: Out of total participants, 241 (64.4%) were females, and 133 (35.6%) were males. According to level of awareness only 11(2.9%) had good awareness. Mean score of knowledge was 7.23. About religion 360(96.3%) knew that eye donation is not against the religious beliefs. Only 26(7%) were aware that Saudi Arabia maintains eye banks. About 230(61.5%) agreed to donate their eyes and 87(23.3%) agreed to donate the eyes of their relatives after their deaths.
Conclusion: The knowledge, attitudes and practice of the study population was poor about corneal transplantation and community should be better educated about the importance of eye donation.

Keywords: attitudes, knowledge, cornea, transplant, Saudi Arabia

Introduction

Blindness is a major issue in various part of the world. The corneal damage is considered as one of the important causes, which require corneal transplantation [1] corneal transplantation is a preferred method to treat corneal blindness, a condition that leads to total vision loss. [2] The importance of corneal transplantation is further highlighted by statistics from the World Health Organization (WHO), which reveal that approximately 39 million people suffer from blindness; another 285 million people suffer from low vision. Statistics further show that out of the reported 45 million cases of total blindness, corneal blindness comprises 6-8 million. [3,4] Corneal blindness is caused by different factors including trachoma, ulceration of the cornea as a result of vitamin-A deficiency, traditional eye medicine, neonatorum ophthalmic and many others.[5] The statistics noted above are clear testaments to the growing need for treatment options for eye problems. Among the health challenges that are treated with transplantation, corneal transportation is the most requested. However, corneas are the least donated organ, based on statistics from the Saudi Center for Organ Transplantation. [6] Therefore, a key challenge facing Saudi Arabia is the large number of people waiting for corneal transplant and a small number of corneas donated, despite there are many specialized eye hospitals in major cities of the country, where transplantation can be performed.[7] There are many factors that contribute to the low level of awareness and willingness to donate eyes, including education, employment and cultural practices such as beliefs and others.[8]One of the major factors, is a low level of public awareness about eye donation. A study by *Krishnaiah S* confirmed that 2177(28.0%) of subjects were aware about eye donation and only 2488(32.9%) were willing to donate their own organs and 39(0.5%) were already register for eye donation after death.[9] Up till now there have been no study, about corneal donation willingness, among the general population in Saudi Arabia. So we designed this study to find out donation knowledge and attitude of the surrounding population.

Objectives

1. To assess the knowledge of the Saudi population regarding eye donation and corneal transplants.
2. To determine the level of willingness to donate eyes among the Saudi population.

Material and Methods

It is a descriptive cross-sectional study, and conducted in Western region of Saudi Arabia (Makkah, Jeddah, and AL-Madinah cities) during period from July to October 2016. The data were collected via a structured questionnaire translated into Arabic language and pre-tested among a small group of people in a mall which was not included in the study at Makkah city, socio-demographic information (age, gender, education, occupation) were taken with 12 questions about knowledge and 2 questions about attitudes. We assess the level of awareness for each participant by scoring those 14 questions by giving 1 score point to each question, so the total points were14 points. The participant were divided into 3 groups which were poor (0-7 points), satisfactory (8-10 points) and good (11-14 points). The participant were

interviewed with the questionnaire after informed consent was taken. We register all the malls in the above mentions cities and found 10 in Makkah and al-Madinah and 50 in Jeddah as we have to select five from each city, so we selected every 2nd in Makkah and al-Madinah and every tenth in Jeddah. The sample size were 374 participants, 133 of them were males and 241 were female. Distribution was 130 samples from Jeddah, 114 from AL- Madinah and 130 from Makkah cities. The study population were consecutively selected, included participants who were adult (>15 year old), Saudi nationality and who answered the question (Have you ever heard about eye donation) by (yes). Participants who disagree to participate in the study were excluded. Ethical approval was obtained from institutional ethical committee of Umm-Al-Qura University, reference number was HAPO-02-K-012-2017-03-187.

Statistical analysis

The data was entered and analyzed with the help of SPSS ver23 software. Percentage or proportion of correct answer was calculated. Mean, median, mode, range and standard deviation of individual and total score of knowledge factors was calculated. Cross table was done between demographics (Age groups, education, gender and occupation) and other variables. T-test, mean ± standard deviation and Chi-square test was used. P value which was less than 0.05 considered statistically significant.

Results

This cross-sectional study was conducted among of 374 Saudi participants, 241 (64.4%) were females and 133 (35.6%) were males. Some of the participants 109 (29.1%) possessed a Bachelor's degree. Mean age was 28.95 ± 10.63 years. The largest category of occupation 102 (27.3%) was teachers (Table 1). About 208 (54.9%) participants were aware that eye donation is done after death. Regarding which part of the eye should be used in transplantation, female 80 (33.2%) had more awareness than male 33 (24.8%). (Table 2). Out of 109 bachelor degree participants 21(19.3%) were aware that hospital is the proper place to go if you want to donate eyes. Regarding storage of donated eyes in eye bank, similar results were found between bachelor degree 51 (46.8%) and under bachelor degree 128 (48.3%) (Table 3). It was observed that 230 (61.5 %) of the participants were willing to donate their eyes and 87 (23.3%) of them were willing to donate their relatives eyes (Table 4). This study found that 11(2.9%) had good, 153 (40.9%) had satisfactory and 210 (56.1%) had poor level of awareness. The mean score of knowledge was 7.23 (Table 5). Regarding the source of information about eye donation, the Internet was the most common source111 (29.7%), followed by other resources 104(27.8 %) then (social media, TV then newspapers) 62(16.8%).

Table 1: Sociodemographic factors frequency

Parameter	Category	Frequency (N=374)	Percentage (%)
Age	≤ 20	70	18.7
	21–29	170	45.5
	30–39	72	19.3
	≥40	62	16.6
Gender	Male	133	35.6
	Female	241	64.4
Occupation	Medical branch	89	23.8
	Military	4	1.1
	Teaching	102	27.3
	Private company	29	7.8
	Not working	77	20.6
	Other	73	19.5
Education	Bachelor's degree	109	29.1
	Below Bachelor's degree	265	70.9

Table 2: Gender distribution and awareness about eye donation.

Parameter	Male (N=133) (%)	Female (N=241) (%)	Total (N= 374) (%)	Mean ± SD	T-test	P-value
Eye donation is done after death	79(59.4)	129(53.5)	208(55.6)	0.6 ± 0.50	1.09	0.274
The best time to do eye donation is within 6 hours of death	48(36.1)	94(39)	142(38)	0.36±0.50	-0.55	0.578
First-degree relatives have the right to decide to do eye donation for a dead person	94(70.7)	159(66)	253(67.6)	0.71±0.45	0.92	0.352
A person who had a contagious disease cannot donate an eye	118(88.7)	209(86.7)	272(87.4)	0.90 ± 0.31	0.55	0.576
A donated eye can be stored in an eye bank	59(44.4)	120(49.8)	179(47.9)	0.44 ± 0.50	-1.00	0.314
Eye donation will not cause facial deformity	71(53.4)	142(58.9)	213(57)	0.53 ± 0.50	-1.03	0.300
Eye donation cannot be performed at home	125(94)	233(96.7)	358(95.7)	0.94± 0.23	-1.23	0.218
The part of eye that will be donated is the cornea	33(24.8)	80(33.2)	113(30.2)	0.25 ± 0.43	-1.70	0.091
The identity of the donor and receiver will not be revealed	57(42.9)	98(40.7)	155(41.4)	0.43 ± 0.50	0.41	0.680
Eye donation is not against religious beliefs	127(95.5)	233(96.7)	360(96.3)	0.95 ± 0.20	-0.58	0.561
Awareness of eyes banks in KSA	5(3.8)	21(8.7)	26(7)	0.04 ± 0.20	-1.80	0.071
Awareness of going to hospital to donate an eye	25(18.8)	37(15.4)	62(16.6)	0.19± 0.40	0.85	0.391

Table 3: Educational level and awareness about eye donation.

Parameter	Bachelor's degree (N= 109) (%)	Below Bachelor's degree (N= 265) (%)	Total (N= 374) (%)	Mean ± SD	T-test	P-value
Eye donation is done after death	59 (54.1)	149(56.2)	208(55.6)	0.54±0.50	-0.37	0.711
The best time to do eye donation is within 6 hours after death	32(29.4)	110(41.5)	142(38)	0.29±0.45	-2.20	0.028*
The first-degree relatives have the right to decide to do eye donation for a dead person	75(68.8)	178(67.2)	253(67.6)	0.70±0.50	0.30	0.758
The person who had contagious disease cannot donate his eye	90(82.6)	237(89.4)	327(87.4)	0.83±0.40	-1.82	0.069
The donated eye can be stored in eyes bank	51(46.8)	128(48.3)	179(47.9)	0.47±0.50	0.26	0.790
Eye donation will not cause deformity to face	49(45)	164(61)	213(57)	0.45±0.50	-0.03	0.003*
Eye donation cannot be performed at home	102(93.6)	256(96.6)	358(95.7)	0.94±0.24	-1.31	0.189
The part of eye that will be donated is the cornea	23(21.1)	90(34)	113(30.2)	0.21 ± 0.41	-2.47	0.014*
The identity of the donor and receiver not be revealed	40(36.7)	115(43.4)	155(41.4)	0.37 ± 0.50	-1.19	0.232
Eye donation is not against the religious beliefs	105 (96.3)	255(95.2)	360(96.3)	0.96 ± 0.18	0.08	0.962
Awareness of eyes banks in KSA	8(7.3)	18(6.8)	26(7)	0.07 ± 0.26	0.19	0.850
Awareness of going to hospital to donate their eye	21(19.3)	41(15.5)	62(16.6)	0.19± 0.40	0. 90	0. 370

*Statistically significant result (P<0.05); statistical test use; independent t-test.

Table 4: Gender distribution and attitudes about eye donation.

Parameter	Male (N=133) (%)	Female (N=241) (%)	Total (N= 374) (%)	Mean ± SD	T-test	P-value
Agree to donate their relative's eyes	28(21.1)	59(24.5)	87(23.3)	1.80 ± 0.40	0.75	0.452
Agree to donate their eyes	90(67.7)	140(58.1)	230(61.5)	1.23 ± 0.50	- 1.82	0.068

Table 5: Level of awareness by scoring system.

Category Points (N= 14)		Frequency (N= 374)	Percentage (%)
Poor	(0-7)	210	56.1
Satisfy	(8-10)	153	40.9
Good	(11-14)	11	2.9

Discussion

Public awareness about eye donation is facing precisely the same challenges and obstacles as kidney donation did a couple of decades ago [6]. A critically important issue that has to be highlighted to eye donors is the Islamic standpoint of organ donation. One of the key issues regarding organ donation is, the permission to donate with different degree of variability in different parts of world. From this point of view, 360 (96.3%) of our participants were aware that religion allows organ donation and that it was not against religious beliefs. Our results similar to studies reported by Ronanki *et al.,* [11] from South India 353 (99.4%) and Krishnaiah *et al.,* [9] from India 1555 (99.6%), while it was less in study reported by Ali *et al.,* [10] from Pakistan 77(48.7%).The reason behind these disparate results is the significant difference in religion and culture between different countries

Two hundred thirteen (57%) of our participants were aware that eye donation would not cause deformity to the face, these results partially consistent with those of Ronanki *et al.,* [11] 248(70%), while it was more in study reported by Krishnaiah *et al.,* [9] 1552(99.4%) and less in studies reported by Eze *et al.,* [12] from Africa 60(33%), Yadav *et al.,* [13] from India 98(24.5%) and Ali *et al.,* [10] 21(13.9%). Therefore Lack of awareness about eye donation procedure consider to be one of the barrier to eye donation.

Our study showed that 170 (47.9%) of participants were aware of eye banks in KSA. This finding is similar to that of Ronanki *et al.,* [11] 204 (57.5%) and Gupta *et al.,* [14] from Bangalore 62 (32.9%) while it was less in study reported by Bharti *et al.,* [15] from Malaysia 9 (2.25%). The majority of our participants 358 (95.7%) were aware that the eye donation could not be performed at home, similar to the findings of Bhandary *et al.,* [16] 397 (90.3%) from Malaysia, while it was less in studies reported by Eze *et al.,* [12] 138(76%) and Bharti *et al.,* [15] 100(25%).

About 230(61.5%) of participants agreed to donate, their eyes after their death, our results are similar to studies reported by Y-W Yew *et al.,* [17] in Singapore 440(67%) and Yadav *et al.,* 256(64.25%) [13], while it was more in study reported by Gupta *et al.,* [14] 160(85.1%) and Ronanki *et al.,* [11] 538(82%). Regarding the source of information about eye donation, the Internet was the most common source111 (29.7%) similar results reported by Rajkumar *et al.,* [18] 186(95%) of resources were electronic and print media different results reported by Gupta et al., [14] 144(77.1%) of participants consider TV as the most common source of information.

For the generalization representative samples should have been taken from all regions (North, South, East and Centre) but we limited our study to only Western region because of limitation of resources.

Conclusions

The knowledge, and attitudes of the study population was satisfactory in general, even though there were some variables reported poor awareness about corneal transplantation including eye banks and organization who is responsible to do

corneal transplantation. The community should be better educated about the importance of eye donation and corneal transplantation, so that they will pledge their own eyes for donation and motivate their relatives to do the same.

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