

# Knowledge and Attitude Regarding Eye Donation and Corneal Transplantation among Medical Students of Taibah University in Medina, Saudi Arabia 2015

Nojood Hameed<sup>1</sup>, Esraa Jadidy<sup>2</sup>

<sup>1,2</sup> MBBS, College of medicine, Taibah University, University Road, Madinah, Saudi Arabia

## Abstract:

**Background and objectives:** Eye donation after death is used successively to treat many corneal diseases. This study aims to assess knowledge and willingness of Taibah medical students on eye donation.

**Design and Setting:** During March to April of 2015, this cross-sectional study analyzed data from 408 students at College of Medicine Taibah University, Madinah, Saudi Arabia.

**Subjects and Methods:** The data were collected through a self-administered validated structured questionnaire. The questionnaire included socio-demographic data, and data about students' awareness and knowledge on eye donation. The collected data were analyzed and compared between male and female students using appropriate statistical tests with the level of statistical significance was defined as  $P \leq 0.05$ .

**Results:** The mean age of the studied 408 students was 21.8 (1.7) years. Their awareness on eye donation was 35.8% (146 out of 408). Less than one fourth of the students were willing to donate their eyes (21.1%), and their close relative's eyes (22.1%). Most of the students (398, 97.5%) did not know about any eye bank in Saudi Arabia. About one third (29.7%) of the students were aware that the cornea can be removed separately from the donor and 54 (13.9%) were aware that the whole eye can be removed. The majority of the students (82.6%) did not know that the donor eye could be removed before transplant. The most important reasons for unwilling of eye donation were lack of awareness (22.6%) and fear of unknown (20.1%)

**Conclusions:** The study revealed a relatively low level of awareness and knowledge on eye donation among the studied students which addresses the need to educate and increase awareness of medical students on eye donation after death so that they can spread awareness among their families and community.

**Keywords:** Awareness, Corneal transplantation, Eye donation, Knowledge, Students, Saudi Arabia.

## I. INTRODUCTION

The cornea is the clear tissue at the front of the eye that lets in light and helps focus it on the retina. The only substitute for a human cornea when diseased is another human cornea donated at death by someone who leaves a living legacy [1]. Corneal transplants are successful sight-saving operations, More than 90 percent of corneal transplant operations are successful, the first successful one was performed in Olomouc, Moravia, on 7 December 1905 [2].

There is no upper age limit to eye donation, people of all ages can donate eyes. The eye banks match recipients with corneas from similar aged donors. Eye donation normally occurs within six hours of death, a cornea is usually transplanted within three to seven days of donation [2].

The most common reason for corneal transplantation in younger people is a condition called keratoconus where the cornea becomes misshapen and cone-shaped. In older people, age-related or inherited conditions may lead to cloudiness of the cornea [3].

There is a huge need for the availability of transplantable donor corneas worldwide to reduce the burden of corneal blindness due to corneal opacity, organ donors who provide the eye tissue that makes these sight-restoring operations possible will become even more important [4].

This study aimed to assess the awareness level and willingness regarding eye donation among medical students in Medina, Saudi Arabia and to spread the awareness of corneal transplantation among them and the community as well which may increase the eye donation percentage.

## **II. METHODS**

During March to April of 2015, this cross-sectional survey was conducted to determine the level of knowledge and attitude toward eye donation and corneal transplantation among medical students (both males and females) of Taibah University. The study targeted all medical students in Taibah University but 408 students of them agreed to participate, they were drawn by non-random convenient technique. After Clarification of the research objectives and assurance of the confidentiality and privacy of the information conducted by the participants, their responses were reported using English self-administered questionnaires in electronic form, it was sent to them through patch leaders, it includes the following sections: Sociodemographic data, Eye donation characteristics, Knowledge of eye donation and Knowledge of corneal transplantation.

A pilot study of 20 students was conducted to modify the questionnaire. These participants were not involved in the original survey. Questionnaire reliability was determined using Cronbach's alpha (0.879). Approval of the Ethical Committee of the Faculty of Medicine was obtained. The collected data were entered and analyzed using SPSS version 22.0. Data were presented using frequencies, mean and standard deviation as appropriate. The students' knowledge and awareness on eye donation were assessed, analyzed and compared by students' sex using chi square and Fischer Exact tests as appropriate. P value  $\leq 0.05$  was used as a level of statistical significance.

## **III. RESULTS**

Out of 408 students, 166 (40.7%) were males and 242 (59.3%) were females. The mean age of the studied students was 21.8 (1.7) years, and age varied from 18 to 26 years old. About 30% of the studied students were from the third study year, 34% and 36% were from the fourth and fifth years respectively. The percent of married students in the studied sample was 6.9% (table 1).

Table 2 presented students' awareness about eye donation. Of the studied 408 students, 146 (35.8%) were aware of eye donation after death (52, 31.3% were males and 94, 38.8% were females, with no detected statistical significant difference). About one-fifth of the studied students were willing to donate their eyes or their close relative's eyes and the higher percent was among female students with statistical significant difference between male and female regarding these items. Of the studied 408 students, only one male student (0.6%) and 4 female students (1.7%) reported to have organ donor card with statistically significant difference ( $p=0.03$ ). Most of the studied students (398, 97.5%) were not aware about the existence of eye bank in Saudi Arabia. Two hundreds and fifty-nine students (63.5%) knew about eye donation for the first time through the used questionnaire. Other reported sources of information on eye donation were mass media (15%), lectures

(4.9%), friend and relatives (3.1%), faculty doctors (2.7%) and eye donation bank (1.5%), with no major difference by students' sex was observed.

Table 3 displayed the students' knowledge on eye donation. Two hundred and thirty-six students (57.8%) were aware that the consent on eye donation could be given while a person is alive. About one third (29.7%) of the students were aware that the cornea can be removed separately from the donor and 54 (13.9%) were aware that the whole eye can be removed. However, most of students (78.7%) knew that eye should be removed at hospital and 45% did know that eye removal should be done by ophthalmologist. Two hundred and fifty-nine students (63.5%) did know within how much time after death the eyes should be removed. On the other hand, however, 337 students (82.6%) did not know that the donor eye can be stored before transplantation.

Table 4 presented the distribution of perceived reasons for not donating eyes by donors. No reasons were reported by 186 students (45.6%). However, the most important reasons reported by the studied students were lack of awareness on eye donation (22.6%), fear of unknown (20.1%), religious reasons (5.4%), objection of family members (2.9%), and unsuitability of eyes due to ill health (2.5%).

### **Tables of the study:**

**Table 1. Characteristics of studied students**

<b>Characteristics*</b>	<b>N= 408</b>
<b>Age in years, mean ±SD (range)</b>	21.8 ± 1.7 (18-26)
<b>Student sex</b>	
Male	166 (40.7)
Female	242 (59.3)
<b>Study year</b>	
1 <sup>st</sup>	59 (14.5)
2 <sup>nd</sup>	105 (25.7)
3 <sup>rd</sup>	69 (16.9)
4 <sup>th</sup>	86 (21.1)
5 <sup>th</sup>	89 (21.8)
<b>Marital status</b>	
Single	381 (93.4)
Married	27 (6.6)

\*Data are presented by mean ± SD or by n (%).

**Table 2. Response to awareness questions about eye donation among the studied students by their sex**

	<b>Total n= 408 No. (%)</b>	<b>Male n= 166 No. (%)</b>	<b>Female n= 242 No. (%)</b>	<b>P value</b>
<b>1. Are you aware of eye donation?</b>				
Yes	146 (35.8)	52 (31.3)	94 (38.8)	0.14
No	262 (64.2)	114 (68.7)	148 (61.2)	
<b>2. Are you willing to donate your eyes?*</b>				
Yes	86 (21.1)	22 (13.2)	64 (26.5)	0.004*
No	152 (37.3)	71 (42.8)	81 (33.5)	
Don't know	170 (41.7)	73 (44.0)	97 (40.0)	
<b>3. Are you willingness to donate your close relatives' eyes?</b>				
Yes	90 (22.1)	28 (16.8)	62 (25.6)	0.01*
No	121 (29.7)	62 (37.5)	59 (24.4)	
Don't know	197 (48.2)	76 (45.7)	121 (50.0)	
<b>4. Do you have organ donor card?</b>				
Yes	5 (1.2)	1 (0.6)	4 (1.7)	0.03*
No	329 (80.6)	125 (75.3)	204 (84.3)	
Never heard about it	74 (18.2)	40 (24.1)	34 (14.0)	
<b>5. Are you aware of any eye bank in Saudi Arabia?</b>				
Yes	10 (2.5)	4 (2.4)	6 (2.5)	0.96
No	398 (97.5)	162 (97.6)	236 (97.5)	
<b>6. What are the sources of your information on eye donation?</b>				
Through this questionnaire form	259 (63.5)	114 (68.6)	145 (59.9)	0.23
Eye donation campaign	6 (1.5)	0 (0)	6 (2.5)	
Mass media	61 (15.0)	21 (12.6)	40 (16.5)	
Lecture	20 (4.9)	7 (4.2)	13 (5.4)	
Hospital contact	2 (0.5)	0 (0)	2 (0.8)	
Friends/relatives	13 (3.1)	7 (4.2)	6 (2.5)	
Faculty doctors	11 (2.7)	4 (2.4)	7 (2.9)	
Cannot remember	36 (8.8)	13 (7.8)	23(9.5)	

\*Significant

**Table 3. Response to knowledge questions of eye donation among the studied students by their sex**

	<b>Total n= 408 No. (%)</b>	<b>Male n= 166 No. (%)</b>	<b>Female n= 242 No. (%)</b>	<b>P value</b>
<b>1. What is removed from the donor eye for transplant?</b>				
Whole eye globe				
Cornea	54 (13.2)	23 (13.9)	31 (12.8)	
Sclera and Retina	121 (29.7)	41 (24.7)	80 (33.0)	
Don't know	11 (2.7)	6 (3.6)	5 (2.1)	
	222 (54.4)	96 (57.8)	126 (33.1)	0.30
<b>2. Within how much time after death should the eyes be removed?</b>				
As soon as possible	72 (17.7)	18 (10.8)	54 (22.3)	
Within 6 hours	66 (16.2)	30 (18.2)	36 (14.9)	
Within 24 hours/week	11 (2.7)	7 (4.2)	4 (1.7)	
Don't know	259 (63.5)	111 (66.8)	148 (61.2)	0.02*
<b>3. Who should remove eyes from the donor?</b>				
Ophthalmologist	184 (45.1)	84 (50.5)	100 (41.4)	
Optometrist	24 (5.9)	10 (6.2)	14 (5.7)	
Any doctor	6 (1.5)	4 (2.4)	2 (0.9)	
Don't know	194 (47.5)	68 (49.9)	126 (52.0)	0.15
<b>4. The site at which eyes could be removed for donation?</b>				
Hospital				
Home	321 (78.7)	130 (78.3)	191 (78.9)	
Anywhere	2 (0.5)	1 (0.5)	1 (0.4)	
Don't know	3 (0.7)	2 (1.2)	1 (0.4)	
	82 (20.1)	33 (20.0)	49 (20.3)	0.83
<b>5. Donated eye is preserved/stored in:</b>				
Eye bank	222 (54.5)	80 (48.2)	142 (58.7)	
Laboratory	12 (2.9)	9 (5.4)	3 (1.2)	
Refrigerator	14 (3.4)	7 (4.2)	7 (2.9)	
Don't know	160 (39.2)	70 (42.2)	90 (37.2)	0.03*
<b>6. How long can the donor eye be kept/stored before transplant?</b>				
Up to 6 hours	19 (4.2)	8 (4.8)	11 (4.7)	
7-12 hours	15 (3.7)	5 (3.0)	10 (4.0)	
24 hours	7 (1.7)	2 (1.2)	5 (2.0)	
Few day/few weeks	22 (5.3)	11 (6.6)	11 (4.7)	
Fe months/few years	8 (1.9)	3 (1.8)	5 (2.0)	
Don't know	337 (82.6)	137 (82.5)	200 (82.6)	0.80

<b>7. Who gives the donation consent?</b>				
Donor while alive	236 (57.8)	84 (50.6)	152 (62.8)	0.02*
Donor's friends	2 (0.5)	2 (1.2)	0 (0)	
Donor's relatives	25 (6.1)	14 (8.4)	11 (4.5)	
Don't know	145 (35.6)	66 (39.7)	79 (32.7)	
<b>8. Is there any age limit for donor?</b>				
Yes	78 (19.1)	34 (20.5)	49 (18.2)	0.81
No	75 (18.4)	29 (17.5)	46 (19.0)	
Don't know	255 (62.5)	103 (62.0)	152 (62.8)	
<b>9. Is blood group represented a barrier to eye donation?</b>				
Yes	91 (22.3)	36 (21.7)	55 (22.7)	0.46
No	93 (22.8)	43 (25.9)	50 (20.6)	
Don't know	224 (54.9)	87 (52.4)	137 (56.6)	

\*Significant

**Table 4. Distribution of perceived reasons for not donating eyes by donors**

Reason	Total n= 408 No. (%)	Male n= 166 No. (%)	Female n= 242 No. (%)	P value
Lack of awareness	92 (22.6)	44 (26.5)	48 (19.8)	0.45
Fear of unknown	82 (20.1)	32 (19.3)	50 (20.7)	
Religious reasons	22 (5.4)	10 (6.0)	12 (5.0)	
Objection of family members	12 (2.9)	2 (1.2)	10 (4.1)	
Unsuitability due to ill health	10 (2.5)	4 (2.4)	6 (2.5)	
Cultural reasons	4 (1.0)	2 (1.2)	2 (0.8)	
No reasons	186 (45.6)	72 (43.4)	114 (47.1)	

#### IV. DISCUSSION

The study findings revealed a relatively low level of knowledge and awareness on eye donation among the studied Taibah medical students with the overall prevalence was 35.8%. The prevalence of knowledge and awareness was higher among female students (38.9%) compared to male students (31.3%). Also, only one-fifth

of the studied students were willing to donate their eyes or their close relative's eyes and the higher percent was among female students with statistical significant difference between male and female regarding these items.

The awareness and knowledge on eye donation and the willingness to become eye donors appears to be much less than reported in other studies. The prevalence of awareness of eye donation has been reported to be 73.8% in urban population in India [5] and 80.7% in Singaporean adults [6]. In study including university students, the prevalence of awareness on eye donation among the studied students was 86% .<sup>7</sup> In another study among hospital staff, 97% of them had good to excellent knowledge about transplantation of various human organs[8, 9] These differences could be attributed to high social engagement of the studied subjects, in studies reported high rate of students' awareness, because of their professional relationships i.e. affiliation to a nongovernmental organization or school, or family member who had donated eyes.

In this study, a large number of students (321, 78.7%) knew that eye should be removed at hospital and 45% of them did know that eye removal should be done by ophthalmologist. Two hundred and fifty-nine students (63.5%) did also know within how much time after death the eyes should be removed. A study on medical and nonmedical students in New Delhi India also observed that 79.6% of medical students knew that eyes can be donated after death and 63.3% knew that it should be done within 6 hours [10]. On the other hand, however, a cross sectional study in nursing college of Bangalore, India, even through the awareness level was 83%, the study reported that only 62 (32.9%) out of 188 studied students knew about the appropriate place for an eye donation [11]. The place to approach potential donors and how to enroll them as donors remained a major challenge [12].

The majority of students in this study (82.6%), however, did not know that the donor eye can be stored before transplantation. Also, only 175 students knew that either the whole eye (29%) or cornea is removed (13.2%) from the donor. These levels of knowledge are far from that reported in other similar studies. [11, 12] About one-fifth of the studied students have reported that there are age limits of eye donors (19.1%), and that blood grouping represents a barrier for donation (22.3%). According to a recent study, even though the study reported high awareness rate of 93% and the willing to donate eyes was 83%, the respondents have reported the age and the place of eye removal as major limitations of eye donation, [12] as students are more frequently believed that age and spectacle use could impact ability to donate.

The study revealed that 263 students (57.8%) were aware that the consent on eye donation could be given while a person is alive. Mandatory consent for donation expressed before the death of the donor should ideally form the basis for eye donation. However, in the case of unavailability of such consent, consent from adult family members of the deceased donor should be obtained for eye donation. In a study done on the responses of relatives of post-mortem cases, it was revealed that out of the potential post-mortem donors, only 44.3% of relatives of such cases gave consent for donation after intensive counseling [13].

Although, about two thirds of the students did know about eye donation for the first time through this study questionnaire, mass media and lectures were the most important sources of information on eye donation reported by the students. Other studies also found that Mass media in the form of television, newspapers, magazines, and posters as well as publicity campaigns to be the major sources of information on this issue [13, 15].

The reasons for not donating eyes reported by the studied students included lack of awareness on eye donation, fear of unknown, religious reasons, objection of family members, unsuitability of eyes due to ill health, and the cultural constraints. Similar reasons were also reported in other studies, [11, 13, 15] where lack of awareness was cited as the most important reason for people not donating their eyes [11].

The present study appeared to have a number of strengths. The study questionnaire was comprehensive and addressed almost all items related to eye donation knowledge. Also, the study questionnaire has been

validated by an ophthalmologist and a medical research expert. To the best of our knowledge, this study is the first to study the knowledge and awareness on eye donation among medical students in Saudi Arabia. Moreover, and unlike other similar studies, this study has reported the knowledge and awareness according to students' sex. Dissemination of these findings at the College level is as important as to encourage the students to know more about the eye donation and corneal transplant regimen in Saudi Arabia.

### **Conclusion and recommendations:**

The study revealed a relatively low level of awareness and knowledge on eye donation among the studied students. This finding addresses the need to increase the awareness of university students, particularly those in health sciences faculties, on eye donation. Previous reports suggest increasing level of awareness of medical students regarding eye donation is of great value, as these students represent the future health care providers and can encourage their family and community members to donate their eyes after death. This can be achieved by applying educating programs and lectures on the importance of eye donation and benefits of corneal transplantation, and training final year medical students to motivate the families of ill patients to pledge for eye donation.

### **Study Limitations:**

As a limitation of this study, the study included students from only one medical college and a modest sample size that future researches will need to include multi-college design to assess the extent to which the results of this study are generalizable.

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### **Conflict of interest:**

The authors declare that there have no competing interests regarding the publication of this research.

## **REFERENCES**

- [1] NHS blood and transplant [Internet]. News room. Fact sheets. Available from:[http://www.organdonation.nhs.uk/newsroom/fact\\_sheets/cornea\\_transplantation\\_fact\\_sheet.asp](http://www.organdonation.nhs.uk/newsroom/fact_sheets/cornea_transplantation_fact_sheet.asp). Accessed 11/3/2015.
- [2] Waziri-Erameh. Joseph M, Afekhide O. Ernest ,Omolabake T. Edema. Knowledge And Attitude Of Nigerian Ophthalmologists Towards Cornea Donation And Corneal Graft. Journal of Medicine and Biomedical Research. December 2007.
- [3] The foundation for prevention of blindness [Internet]. News. Available from : <http://www.eyecharity.com/news/archives/06-2014>. Accessed 11/3/2015.
- [4] Eye Bank Association of America [Internet]. Frequently Asked Questions. Available from : <http://www.restore sight.org/about-us/frequently-asked-questions/>. Accessed 11/3/2015.
- [5] American Academy of Ophthalmology, The Eye M.D. Association. Ophthalmologists Encourage Organ Donation to Help Restore Sight for Thousands [Internet]. Available from: <http://www.aao.org/newsroom/release/ophthalmologists-encourage-organ-donation-to-restore-sight.cfm>. Published 11/3/2015. Accessed 21/3/2015.
- [6] Venkata Ramana Ronanki, SethuSheeladevi, Brinda P Ramachandran and Isabelle Jalbert. Awareness regarding eye donation among stakeholders in Srikakulam district in South India. BMC Ophthalmology. 2014.
- [7] Dandona R, Dandona L, Naduvilath TJ, McCarty CA, Rao GN. Awareness of eye donation in an urban population in India. Aust N Z J Ophthalmol 1997; 27: 166-169.
- [8] Yew YW, Saw SM, Pan JC, Shen HM, Lwin M, Yew MS, Heng WJ. Knowledge and beliefs on corneal donation in Singapore adults. Br J Ophthalmol 2005; 89: 835-840.



- [9] BhartiMK, Reddy SC, Tajunisah I, Ali N. Awareness and Knowledge on Eye Donation Among University Students. *Med J Malaysia* 2009;64(1)41-45.
- [10] Singh P, Kumar A, Pandey CM, Chandra H. Level of awareness about transplantation, brain death and cadaveric organ donation in hospital staff in India. *Prog Transplant*. 2002;12:289-292.
- [11] Golchet G, Carr J, Harris MG. Why don't we have enough cornea donors? A literature review and survey. *Optometry*. 2000;71:318-328.
- [12] Dhaliwal U. Enhancing eye donation rates. Training students to be motivators. *Indian J Ophthalmol*.2002;50:209-212.
- [13] Gupta A, Jain S, Jain T,GuptaK. Awareness and Perception Regarding Eye Donation in Students of a Nursing College in Bangalore. *Indian J Community Med*. 2009; 34(2): 122-125.
- [14] Ronanki VR,SheeladeviS, RamachandranBP, Jalbert I. Awareness regarding eye donation among stakeholders in Srikakulam district in South India. *BMCO phthalmology* 2014, 14:25.
- [15] Phadke KD, Anandh U. Ethics of paid organ donation. *PediatrNephrol*. 2002;17:309-311.
- [16] Tandon R, Verma K, Vanathi M, Pandey RM, Vajpayee RB. Factors affecting eye donation from post-mortem cases in a tertiary care hospital. *Cornea*. 2004;23:597-601.
- [17] Krishnaiah S, Kovai V, Nutheti R, Shamanna BR, Thomas R, Rao GN. Awareness of eye donation in the rural population of India. *Indian J Ophthalmol*. 2004;52:73-78.