



Original Research

## Organ transplantation and donation from the point of view of medical students in Iran: Ethical aspects and knowledge

Mahmoud Abbasi<sup>1</sup>, Mehrzad Kiani<sup>2</sup>, Mehdi Ahmadi<sup>3</sup>, Bahare Salehi<sup>1\*</sup>

<sup>1</sup> Medical Ethics and Law Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup> Department of Medical Ethics, Faculty of Traditional Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>3</sup> Razi Vaccine and Serum Research Institute (RVSRI), Agricultural Research, Education and Extension Organization (AREEO), Karaj, Iran

Correspondence to: [bahar.salehi007@gamil.com](mailto:bahar.salehi007@gamil.com)

Received January 6, 2018; Accepted January 25, 2018; Published January 31, 2018

Doi: <http://dx.doi.org/10.14715/cmb/2018.64.1.16>

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**Abstract:** Organ transplantation is an effective process that prolongs the lives of individuals suffering from incapacitating conditions. The aim of this study was to evaluate the view point of medical students in Iran regarding ethical aspects and knowledge on organ transplantation and donation. The participants included 165 medical students from different faculties of Shahid Beheshti University of Medical Sciences, Tehran, Iran. They were assessed using a reliable questionnaire that examined their ethical aspects and knowledge regarding organ transplantation and donation. All data analyses were performed using *Chi*-square and analysis of variance tests with SPSS software. Results showed that main sources of respondents' knowledge on organ transplantation and donation were TV, 51.52% ( $n = 85$ ) and Internet, 19.39% ( $n = 32$ ). 91.51% ( $n = 151$ ) of the respondents understand and 8.48% ( $n = 14$ ) do not understand the concept of brain death. 49.69% ( $n = 82$ ) of the respondents were willing to donate their organs. A brain death donor was selected by respondents as the best option for organs transplantation (72.12%;  $n = 119$ ). The respondents selected young patients as the preferred recipients of an organ (69.69%;  $n = 115$ ). There was no correlation between gender, age, educational level, marital status and attitude towards organ transplantation. From the results, there is need for an organized educational planning for medical students in ethical issue and knowledge on organ and tissue transplantation.

**Key words:** Ethical issue; Brain death; Willingness to donate; Education planning.

### Introduction

Medical knowledge has provided valuable and particularly critical services in its advancement (1), such as organs transplantation. Thousands of people owe their health to this part of medical science. Currently, organ transplant is one of the newest sciences and is certainly a revolution in medical science. Many issues including legal, religious and ethical issues have been raised (2, 3), following the advent of this new science. Organ transplantation is a medical procedure in which there is transfer of cells, tissues or organs in the body of a recipient in such a way that it maintains its biological functions (4). If the transplanted tissue is in its natural anatomical position, it is called "orthopedic," and if it placed in a non-natural anatomical position, it is called "heterotopic." Organ failure is one of the critical health problems worldwide. Organ transplantation is a helpful treatment strategy against irreversible vital organ failures and donated organs transplanted from a cadaver, or living individuals, provide a second life chance for patients with organ failure (5-8). Recently, the number of patients waiting for organ or tissue transplantation increased; there has been no significant number of organ donations in Iran and throughout the world (9). Many ethical, moral and social issues on the supply and use of cadaveric and living donations has led to severe shortage of donated organs (10). Studies showed that pro-

found knowledge on organ donations is one of the most important reasons and it can influence high refusal rate of consent for donation (11).

The ethical and conceptual aspects related to organ transplantation are changeable, controversial and are predicated on personal approaches' and other factors such as religious, geographical, socio-cultural, economic and emotional (12). The ethical aspects are essential when trying to comprehend the complexity of conditions that permeate the main topic of organ transplantation (12).

The shortage or lack of knowledge on legal and ethical issues of organ transplantation and donation among health care providers, who should be the most knowledgeable, is recognized as one of the factors that could limit the availability of donor organs (13). Therefore, healthcare professional's perspective on organ transplantation and donation is an essential factor that promotes the positive effect and increases the donation rate (14, 15).

The point of view of medical students is more likely to promote organ transplantation and donation, and help to significantly increase awareness and thus, enhance the attitudes of others towards organ transplantation and donation.

No or few studies have already been conducted on the attitude towards ethical issues on organ transplantation and donation among university students in Iran.

The purpose of the present study was to explore the knowledge and ethical issues on organ transplantation and donation among third-grade students in different faculties of Shahid Beheshti University of Medical Sciences University, Tehran, Iran.

## Materials and Methods

In this descriptive study, third-grade students in faculties of medicine, pharmacy and nursing-midwifery in Shahid Beheshti University of Medical Sciences, Tehran, Iran, were evaluated in the year, 2017. The study was performed using a self-administered questionnaire on students in different faculties. The questionnaire was composed of questions on socio-demography, knowledge, willingness to donate an organ and ethical beliefs regarding organ transplantation and donation. All the questionnaires were in printed format and the survey was self-administered.

A total of 250 third-grade students in the faculties of medicine, pharmacy and nursing-midwifery were surveyed, and the research was carried out on 165 students who accepted to participate in the study. The participants were informed about the aim of the study and its performers. They were assured of confidentiality with regards to their personal information, and their approvals were obtained.

## Statistical analysis

The data generated from the questionnaires were entered into Statistical Packages for the Social Sciences (SPSS; IBM SPSS Statistics for Windows, version 11.5; IBM, Armonk, New York) for analysis. All qualitative variables were illustrated through frequencies and percentages and all quantitative variables were illustrated through mean and standard deviation. *Chi-square* test was applied and  $P < 0.05$  was considered significant.

## Results

### Participants' socio-demographic characteristics

Socio-demographic characteristics of the respondents are shown in Table 1. Out of the 165 students participated in the study, 60.6 ( $n = 100$ ) and 39.4% ( $n =$

**Table 1.** Participants' socio-demographic characteristics.

Factors	N (%)
<b>Gender</b>	
Women	100 (60.6)
Men	65 (39.4)
<b>Age (years)</b>	
Under 20	21 (12.73)
21-29	134 (81.21)
30 and above	10 (6.06)
<b>Faculty</b>	
Medicine	55 (33.33)
Pharmacy	42 (25.46)
Nursing-Midwifery	68 (41.21)
<b>Level of education</b>	
Undergraduate	42 (25.45)
Masters, Medicine Doctor and Doctor of Pharmacy	98 (59.4)
Ph.D.	25 (15.15)
<b>Marital status</b>	
Single	142 (86.06)
Married	23 (13.94)
<b>Religion</b>	
Muslim	165 (100)
Other	0 (0.0)
<b>Total</b>	165 (100)

65) were women and men, respectively. Distribution of participants in relation to faculties was 33.33 ( $n = 55$ ), 25.46 ( $n = 42$ ) and 41.21% ( $n = 68$ ) for medicine, pharmacy and nursing-midwifery, respectively. The educational level of the respondents was categorized into three groups including Undergraduate, Masters, Medicine Doctor and Doctor of Pharmacy and Ph.D., and frequency distribution of these groups were 25.45 ( $n = 42$ ), 59.4 ( $n = 98$ ) and 15.15% ( $n = 25$ ), respectively. In this study, all the respondents were Muslim.

### Knowledge and awareness of organ transplantation and donation

In the current study, results obtained from assessment of medical student's knowledge regarding important issues related to organ transplantation and donation are

**Table 2.** Knowledge of students on essential aspects of organ transplantation and organ donation.

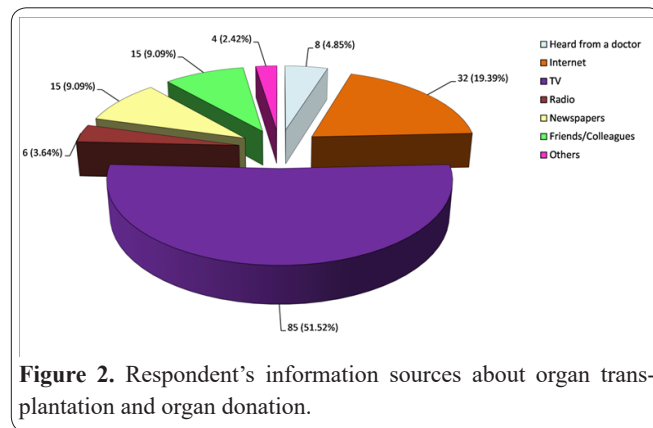
	Faculty			All, n (%)	P-value
	Medicine, n (%)	Pharmacy, n (%)	Nursing-Midwifery, n (%)		
Do you understand the concept of brain death?					
Yes	50 (30.3)	41 (22.84)	60 (36.36)	151 (91.51)	0.02
No	5 (3.03)	1 (0.6)	8 (4.48)	14 (8.48)	
Does your religion allow you to donate an organ?					
Yes	54 (32.73)	42 (25.45)	64 (38.79)	160 (96.97)	0.01
No/unsure	1 (0.61)	-	4 (2.42)	5 (3.03)	
Know somebody who had organ transplantation					
Yes	2 (1.21)	1 (0.61)	4 (2.42)	7 (4.24)	0.41
No	53 (32.12)	41 (24.84)	64 (38.79)	158 (95.75)	
Know somebody waiting for transplantation					
Yes	-	2 (1.21)	1 (0.61)	3 (1.82)	0.23
No	55 (33.33)	40 (24.24)	67 (40.61)	162 (98.18)	

**Table 3.** Respondents point of view regarding an ideal candidate of organ recipient. Respondents selected more than one choice.

	Faculty			
	Medicine, n (%)	Pharmacy, n (%)	Nursing-Midwifery, n (%)	All, n (%)
Parents	39 (23.64)	29 (17.57)	30 (18.18)	98 (59.39)
Spouse	5 (3.03)	18 (10.91)	22 (13.33)	45 (27.27)
Children	1 (0.6)	1 (0.6)	1 (0.6)	3 (1.81)
Friends	20 (12.12)	14 (8.48)	20 (12.12)	54 (32.72)
Other	5 (3.03)	5 (3.03)	15 (9.09)	25 (15.15)

shown in Tables 2 and 3. Results showed that 91.51% ( $n = 151$ ) of the respondents understand and 8.48% ( $n = 14$ ) do not understand the concept of brain death. 30.3% ( $n = 50$ ) of the medical students, 22.84% ( $n = 41$ ) of the pharmacy students and 36.36% ( $n = 60$ ) of the nursing-midwifery students have knowledge on brain death.

Most of the students, 96.97% ( $n = 160$ ) believed that their religion allowed them to donate their organs when a person needs them ( $P = 0.01$ ). A total of 4.24% ( $n = 7$ ) of the students know someone who has undergone organ transplantation and 1.82% ( $n = 3$ ) know someone who is waiting for organ transplantation. In all the faculties, most of the students selected parents as the most ideal candidate for organ transplantation (59.39%;  $n = 98$ ) (Table 3). The results of assessment of respondent's awareness on the transplantable human organs showed that highest knowledge was related to heart, lung, kidney, liver and blood donation when compared with other tissues and organs (Figure 1). The skin was selected by all the students in the three faculties as lowest organ that can be donated. The respondent's information sources with regards to organ transplantation and donation are shown in Figure 2. The results show that the primary sources of their knowledge on organ transplantation and donation were TV (51.52%;  $n = 85$ ), internet (19.39%;  $n = 32$ ), newspapers (9.09%;  $n = 15$ ), friends/colleagues



**Figure 2.** Respondent's information sources about organ transplantation and organ donation.

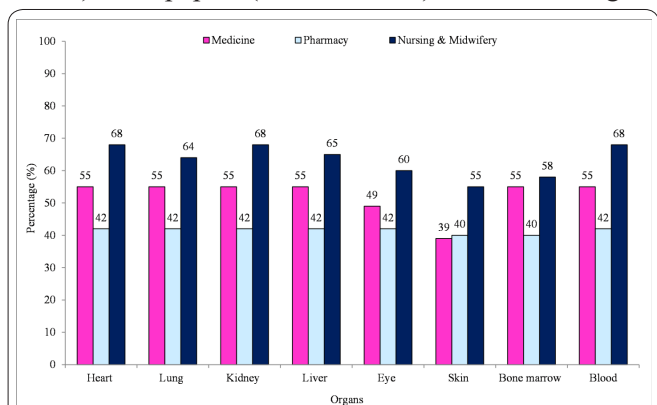
(9.09%;  $n = 15$ ), from a doctor (4.85%;  $n = 8$ ), radio (3.64%;  $n = 6$ ) and others (2.42%;  $n = 4$ ).

**Willingness to donate by respondents**

Evaluation of the willingness to donate among the respondents showed that 49.69% ( $n = 82$ ) were willing to donate their organs. Also, 61.21% ( $n = 101$ ) agreed to donate organs to their relatives that need organs in a particular situation. The response of the participants regarding consent showed that 96.96% ( $n = 160$ ) reported that for transplantation, it is necessary to obtain informed consent from donor or donor's family. There is a significant difference between knowledge on allowing organ donation in religion and willingness to donate ( $P = 0.01$ ).

**Ethics and knowledge of transplantation and donation**

Ideal candidate characteristics for organ donation are shown in Table 4. The distribution of best choice option in organ transplantation among respondents was 72.12% ( $n = 119$ ), 20% ( $n = 33$ ), 6.66% ( $n = 11$ ) and 1.21% ( $n = 2$ ) for brain death, cadaver, healthy living donor and paralyzed person, respectively. The results showed that brain death donors is the best option in organ transplantation ( $P = 0.03$ ) and the paralyzed person is a less option among other sources for organ transplantation from respondents' point of view ( $P = 0.01$ ). Regarding



**Figure 1.** Transplantable human organs from the point of view of the respondents. Anyone has permission to select more than one choice.

**Table 4.** Ideal candidate characteristics for organ donation. Respondents selected one choice.

	Faculty			
	Medicine, n (%)	Pharmacy, n (%)	Nursing-Midwifery, n (%)	All, n (%)
Brain death	50 (30.3)	40 (24.24)	29 (17.57)	119 (72.12)
Paralyzed person	0 (0.0)	0 (0.0)	2 (1.21)	2 (1.21)
Healthy living donor	3 (1.81)	0 (0.0)	8 (4.84)	11 (6.66)
Cadaver	2 (1.21)	2 (1.21)	29 (17.57)	33 (20)

**Table 5.** Preference for the recipient of an organ from the point of view respondents. Respondents selected one choice.

	Faculty			All, n (%)
	Medicine, n (%)	Pharmacy, n (%)	Nursing-Midwifery, n (%)	
Priority in organ transplants with those who have not already had organ transplants	10 (6.06)	5 (3.03)	3 (1.81)	63 (38.18)
Priority in organ transplant with young patients	35 (21.21)	30 (18.18)	50 (30.30)	115 (69.69)
Low-income patients	5 (3.03)	3 (1.81)	6 (3.63)	14 (8.48)
Those who disabled their organs due to illness	0 (0.0)	2 (1.21)	3 (1.81)	5 (3.03)
Priority when those who are long time waiting for organ transplants	5 (3.03)	2 (1.21)	6 (3.63)	13 (7.87)

their views on persons preferred for the recipient of an organ, most of the respondents selected young patients (69.69%;  $n = 115$ ), and few chose persons with disabled organs due to illness (3.03%,  $n = 5$ ) (Table 5).

## Discussion

This study aimed to assess the knowledge and ethical issues related to organ transplantation and donation among third-grade students in different faculties in one of the largest universities in Iran. Brain death is vital for retrieval of organs because it ensures organ removal from bodies that have circulation and respiration, thus avoiding ischemic injury to the organs (16). Brain death is very problematic to families with regards to dealing with a tragic loss. In this study, 91.51% ( $n = 151$ ) of the respondents understood the concept of brain death. The results of this study showed a good level of awareness on brain death among the students in this university. Najafzadeh *et al.* (2009) reported that 95.1% of medical students know about brain death in Tehran, Iran (17). Orkideh *et al.* (2012) conducted a study on pre-clinical medical students with regards to brain death and donation in Tehran-Iran, 10 years after legislation. They reported that 93.7% were aware of brain dead donation concept but 24.4% still believed in the chance of recovery after brain death (18). With comparison of their study to the present study, the results are similar.

Religion plays an important role in organ transplantation and donation. In the current study, all the students were Muslim and 96.97% of them believed that their religion allows donating their organs when a person needs them. Al-Faqih (1991) studied the influence of Islamic views on public attitudes towards kidney transplant donation in a Saudi Arabian community. The results of the study showed that Islamic view on concepts of transplantation had the strongest positive influence on organ donation (19). Even though no religion officially forbids organ transplantation from living or cadaver donors, some of the religions are against it (20).

Uncertainty of a difference among religious proclamations on organ donation is invalidated by the fact that several religious institutions around the world identify organ donation as a worthy act (21, 22). The achievement of transplantation activities in Islamic countries is related to factors such as economic situation, religious fatwa, public outlooks and views, medical expertise and motivation available, and the existing systems and laws (23).

In the current study, the respondents stated heart,

lung, kidney, liver and blood as the most transplantable organs. The result of this study is similar to that of several studies performed on organs that can be donated (7, 24, 25) and shows that majority of the patients waiting for organ transplantation are those with mentioned organs failure, and this subject creates alertness as commonly mentioned in the media.

In this study, television (51.52%) is the main source of information for respondents on organ transplantation and donation. Orkideh *et al.* (2012) reported that the main source of information among pre-clinical medical students was media (37.2%) (18). Ghafari *et al.* (2017) illustrated that among Iranian university students, television was found to be the main source of information (26). Kose *et al.* (2015) reported that the most important information source for the participants was television (5). The result of the current study is in parallel with those of these studies. Nowadays, media and especially, television are the most important information sources with regards to health care. Television is used generally by the people; it is shown as the utmost imperative information source for the people. It has been specified that the media, specifically television, should be used actively in order to inform and direct people on organ donation and transplantation (27).

As a recommendation, it has been stated that organ donation and transplantation authorities and organizations should be in close relationships with the media, and non-scientific, misinformative announcements and news should be prohibited in this system (28).

Sanavi *et al.* (2009) performed a survey on medical students of Shahed University in Iran on attitude and willingness towards organ transplantation. They reported that the medical students declared that they were willing to donate various organs: 85% ( $n = 223$ ) after death and 51.1% ( $n = 134$ ) both after and before death (29).

Najafzadeh *et al.* (2009) illustrated that thirty-four (82.9%) medical students in a hospital of Tehran agreed on organ donation after brain death (17). In the current research, 49.69% of the respondents are willing to donate their organs to a person that needs them. The willingness to donate increased to 61.21% when asked if they would donate if a close relative is in need. This increase in willingness to donate was parallel to a study performed by Sönmez *et al.* (2010) among Turkish university students (7). It may be related to the unique structure of the Iranian culture, which places family as the corner stone in a personality's life. In the current study, the main negative reasons with regards to organ transplan-



tation and donation were identified as personal selection, never thinking about organ transplantation, lack of trust in physicians and fear. The unfavorable attitudes of respondents may be related to lack of knowledge on organ transplantation. Growing awareness on organ transplantation is a must in order to make people believe donation and transplantations, and also, the most critical way to inform people is through educational planning. It is necessity to address knowledge on organ transplantation at institutional level and also to develop an ethos regarding ethical principles that informs medical practitioner's decision on organ transplantation. Physician's commitment towards organ donation can unquestionably influence the opinions and decisions of their patients, leading to higher success rates for organ procurement (30, 31).

In the current study, the respondents selected brain death donors as the best option for organ transplantation. At present, most transplants follow multiple organ retrieval from heart beating brain-dead organ donors (32) who have suffered overall and irreversible loss of all brain function and are clinically and legally dead. Mechanical ventilation and medications keeps their heart beating and blood flow to their organs. In spite of the increasing importance of organ transplantation, the number of organs from brain-dead donors is decreasing (33). In this study, most of the respondents selected young patients (69.69%) as preference for the recipient of an organ in transplantation. It may be due to the fact that these people can live longer and benefit from the organs donated to them.

The field of the present study is rarely studied in Iran. It initiates some ground studies on issues medical students face regarding organ transplantation and donation. The main aim of this research was to obtain a general view of medical students on organ transplantation and donation. The sample size was small and highlights attitudes regarding only one private medical institute; more researches need to be conducted in other medical faculties in all universities for a comprehensive viewpoint on organ transplantation and donation in Iran.

Concurrent with the advancement of science, organ transplantation has become one of the new achievements of medical science community. Organ transplantation in the field of medical science has made much progress, and nowadays, vital organs such as the heart, liver, lung and others are implanted. With the advancement and achievement of medical success in transplantation, patients who have no hope of cure and are expected to gradually die in hospitals, now have hope of recovery. The results of this research show inconsistencies between attitude and action. Organ transplantation is a significant problem in Iran, as is the case all over the world. Though, the number of people waiting for organ transplantation is increasing day by day, the number of donated organs is inadequate.

Increase in the awareness of Iranian medical students on ethical aspects and knowledge related to organ transplantation and donation can help in the prospect of transplantation in Iran. Therefore, it seems necessary to make effort to increase the knowledge of these students.

### Conflicts of interest

There is no conflict of interest.

### Acknowledgments

This paper has been extracted from the Ph.D. thesis of Dr. Bahare Salehi and was supported by Vice-chancellor for Research Affairs of Shahid Beheshti University of Medical Sciences, Tehran, Iran.

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