

## Knowledge and Attitudes about Organ Donation among Medical Students in Egypt: A Questionnaire

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### Abstract

**Introduction:** Organ transplantation (OT) is life-saving for patients with failing organs. Shortage of donor organs can be solved by raising the willingness of the population to donate organs. Health-care professionals have a fundamental role in raising the public awareness.

**Methods:** This is a cross sectional descriptive study in which a specially designed self-administered questionnaire to assess knowledge and attitude towards organ donation (OD) was used to perform a survey on a representative sample of pre-medical students in a local high school whose major is biology science and medical students in Faculty of Medicine, Mansoura University, Egypt.

**Results:** A total of 359 students completed the questionnaire. 36% of the students had good knowledge about OD; however, 11.7% of them had good knowledge about brainstem death. 66.3% of students found their information resources insufficient. 77.7% of participants didn't know about the law regulating OD in Egypt. 37% of the students had positive attitude towards organ donation. The most frequent cause for organ donation refusal was lack of confidence in the health care system (31%). There is a significant relation between student knowledge and positive attitude towards OD ( $P=0.003$ ). Students' knowledge was significantly associated with seniority ( $P = 0.0001$ ) and Christian religion ( $P=0.04$ ).

**Conclusion:** There is lack of sufficient knowledge about the legal aspect criteria and details of organ donation process which directly contributing in reducing the positive attitude among Egyptian medical students. In a religiously and culturally accepted background, educational curriculum must focus on the importance of OD in modern surgical practice. Awareness of regulating law and the concept of brainstem death is crucial for positive attitude from OD.

**Keywords:** Organ donation; Medical awareness; Transplantation; Health education; Attitude; Medical knowledge; Egypt

### Introduction

Organ donation (OD) is the cornerstone in the process of transplantation. There is a worldwide shortage of donor organs in comparison to the need for transplantation [1]. There is a significant relation between public attitude towards OD and availability of such organs [2,3]. Thus the main concern of most transplant surgeons is to increase the donor pool and spread the willingness of donation among healthy individuals. Evaluation of public knowledge and attitude towards OD is of crucial importance to evaluate and develop educational programs to raise the public commitment to OD [4,5]. Knowledge and attitude of health care providers towards OD plays a major role in promoting the concept among population [6]. Furthermore, it is of great importance to understand the impact of the educational process among other cultural factors on medical students' attitude towards OD [7].

Many studies have evaluated knowledge and attitude towards OD from various countries but there are few reports from the Middle East area and especially Egypt [4-19]. Egypt is an Arab country with a Muslim majority in its population. In Egypt, organization for deceased OD is still awaited and that makes living donor organ transplantation the only hope for patients with failing organs. Living donor organ transplantation was legalized by a full stand-alone law since the 1970s. Renal transplantation has been performed in Egypt since 1978 and living donor liver transplantation has been performed in Mansoura Gastrointestinal Surgical center since 2004. The aim of this study was to assess and study factors affecting knowledge and attitude towards OD among students before medical school and medical students in the first and last years of their study.

### Methods

This is a cross sectional descriptive study that was designed to

evaluate knowledge and attitude towards organs donation among students at a local high school whose major is science and biology, first and last year students (who are studying basic science level of organs and who are almost finishing surgery and medicine curriculum respectively) at Faculty of Medicine, Mansoura University, Egypt. Fisher's formula was used to calculate the minimal sample size assuming prevalence of positive knowledge and attitude to be 50%, 95% confidence interval and a sample error of 5%. The calculated sample size was 361. The minimal sample size was then inflated by 10% to 397 for compensating non-response. Simple random probability sampling was performed to achieve this survey. First year students in their classrooms, final year students in their clinical rounds and students in two of the biggest high schools were made aware of the purpose of the questionnaire and the efficacy of their participation by face-to-face communication.

A self-administered Arabic questionnaire was used to perform this survey in April, May and June 2014. The Questionnaire include 20 questions either yes or no inventories or multiple choose ones in addition to students' demographics (Supplementary 1). The first sector was about age, sex, religion and residence of the participant. Seven items evaluated the knowledge of the participant about OD. Knowledge score

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ranged from 6 to 16 with higher score indicating higher knowledge. According to the score, the participants were stratified into poor knowledge (score: 6-11) and good knowledge (score: 12-16). The three items had evaluated knowledge of the national legislative law regulating OD. The nine items had evaluated students' attitude toward OD. Attitude score ranged from 9 to 23 with higher score indicating better attitude. Participants were stratified into a group with negative attitude (score: 9-16) and positive attitude (score: 17-23). The last question was about justification of the negative attitude of the participant. To ensure high compliance, the questionnaire consisted of one page that could be filled in less than 10 minutes.

Ethical approval was granted by the local ethical committee of Faculty of Medicine, Mansoura University. All collected data were anonymous and confidential. The participants were informed of the purpose of the survey and they were also informed that the participation in the study was voluntary.

Statistical analysis of the data in this study was performed using SPSS v. 20. Normality of data was assessed by Shapiro-Wilk test. Numerical data were presented as means and standard deviations or medians with ranges. Categorical variables were described using frequency distributions. *P* value < 0.05 was considered significant. Difference between groups was done by independent student *t*- test and Chi-square test.

## Results

A total of 400 students were asked to participate in the survey. Three hundred and fifty nine students (114 (31.8%) students in high school, 125 (34.8%) students in first year of medical school, and 120 (33.4%) students in sixth year of medical school) accepted to participate in the survey with a response rate of 89.7%. The median age of the participants was 19.6 years (ranging from 16 to 29 years). Among responders, 158 were males (44%) and 201 were females (56%) with male to female ratio of 1:1.3. Regarding religion, 342 (95.3%) were Muslims while 17 (4.7%) were Christians. One hundred and forty four participants (40%) were from rural residence while 215 participants were from urban residence (60%).

Stratifying the responders according to their knowledge, 230 responders (64%) had poor knowledge while 129 responders (36%) had good knowledge about OD. Moreover, the percentage of poor knowledge increased (81.3%, n=317) in comparison to good knowledge (11.7%, n=42) concerning brainstem death. The majority of the participants (77.7%, n=279) didn't hear nor read about the law regulating organ transplantation, 19 responders (5.3%) heard about this law, 41 responders (11.4%) read the law while 20 responders (5.6%) stated that was no law regulating OD in Egypt.

Concerning knowledge resources, 231 students (64.3%) had single resource while 128 students (35.7%) had multiple resources for their knowledge about OD information and they also enumerated their resources. Regarding 238 students (66.3%) thought that their information resources were not sufficient in comparison to 121 students (33.7%) who thought they had sufficient information resources. Answering a question about the benefit of OD to the recipient, 51 responders (14.2%) didn't know if it was really beneficial, 18 responders (5%) thought it was not beneficial while 137 (38.2%) and 153 (42.6%) responders thought it was beneficial or very beneficial respectively.

Although 163 students (45%) rated themselves to have a positive attitude in comparison to 226 students (63%) with negative self-rated attitude towards OD, the estimated attitude according to their answers on items assessing attitude was positive in only 133 students (37%) in

comparison to 226 students (63%) with negative estimated attitude. Among those with estimated positive attitude, 77 students (57.9%) were willing to donate to any recipient while 56 students (42.1%) were selective in their desire to donate either to their family or friends. The causes of refusal to donate among those with negative estimated attitude were familial refusal (13%, n=30), religious prohibition (19%, n=43), fear of commercialism (27%, n=61), fear from surgery (10%, n=23) and lack of confidence in the health care system (31%, n=69).

Univariate analysis of various factors supposed to affect students' knowledge and attitude is summarized in Tables 1 and 2. There is a significant association between student knowledge and positive attitude towards OD (*P* = 0.003). Students' knowledge was significantly associated with seniority (*P* = 0.0001) and Christian religion (*P*= 0.04). Attitude towards OD was not significantly associated with seniority (*P*= 0.1) while it was significantly associated with religion (*P* = 0.01). Good

	Good Knowledge	Poor Knowledge	P value
Mean Age	20.3	19.3	0.5
<b>Sex</b>			
Male	52	106	0.3
Female	77	124	
<b>Seniority</b>			
High school student	29	85	
Medical student: 1 <sup>st</sup> year	38	87	0.0001
Medical student: 6 <sup>th</sup> year	68	58	
<b>Religion</b>			
Muslims	119	223	0.04
Christian	10	7	
<b>Residency</b>			
Rural	47	97	0.3
Urban	82	133	
<b>Attitude</b>			
Positive	61	72	0.003
Negative	68	158	

Table 1: Univariate analysis of variables supposed to affect students' knowledge of organ donation.

	Positive attitude	Negative Attitude	P value
Mean Age	19.7	19.6	0.2
<b>Sex</b>			
Male	53	105	0.2
Female	80	121	
<b>Seniority</b>			
High school student	44	70	
Medical student: 1 <sup>st</sup> year	38	87	0.1
Medical student: 6 <sup>th</sup> year	51	96	
<b>Religion</b>			
Muslims	122	220	0.01
Christian	11	6	
<b>Residency</b>			
Rural	60	84	0.1
Urban	73	142	
<b>Knowledge</b>			
Good	61	68	0.003
Poor	72	158	

Table 2: Univariate analysis of variables thought to affect students' attitude towards organ donation

knowledge about brainstem death was only significantly associated with seniority ( $P=0.0001$ ) and overall knowledge score ( $P=0.0001$ ).

## Discussion

Donated organs represent the last resort for millions of patients with failing organs worldwide [20]. There is a global shortage of donor organs in comparison to patients awaiting transplantation [21]. Public knowledge and attitude affects commitment for OD [1,2]. It is a challenge to persuade healthy people to be hospitalized, suppose their bodies to mutilation and take the risk of death [22]. Attitude of medical students towards OD is crucial to overcome the shortage of donor organs [6,23]. Future physicians will spread the knowledge, propagate the concept, and highlight the benefits of OD in the public. This study aims to explore and assess various factors affecting the knowledge and attitude of medical students towards OD. To our knowledge, this is the first report from Egypt which is one of the largest Arab, Middle Eastern and African populations.

In this study, the overall positive attitude was only present in 37% of the students. This is extremely low in comparison to reports from other countries: Italy (91%) [24], Brazil (69%) [25], Germany (55-70%) [26], Pakistan (62%) [12], Turkey (59%) [13] and China (50%) [27]. Adequate knowledge about OD was present in only 36% of medical student which is also low in comparison to other countries: Pakistan (65%) [12,28] and Nigeria (60%) [29]. This indicates a suitable situation to explore various factors contributing to the negative attitude and poor knowledge among medical students. There was no significant improvement in the attitude towards OD in senior medical students although the knowledge significantly improved with seniority and the knowledge was significantly associated with better attitude. This indicates that there are other psychosocial and demographic variables that affect the attitude towards organ donation.

The legal framework is of paramount importance to increase OD rate [30]. In addition to its role in facilitating and regulating the process of OD, it enroots public trust in the health care system and thus improves the public attitude towards OD [17]. In this study, about 83% of the participants thought there was no law regulating OD or didn't hear or read about this law. This finding justifies that the most frequent cause of refusal to donate organs among students with negative attitude was the lack of confidence in the health care system (31%) followed by the fear from commercialism (27%). Knowledge of legislative law was reported to be as high as 84% among ICU nurses and patients in Austria, 60% among non-health science students in Austria [17], 44% among Swiss first-year medical students [31], and 51% among first-year medical students in France [32]. Even the lowest reported rate of knowledge of legislative law among medical students was from Poland (23%) was higher than the knowledge of our study population [33].

The effect of religion on the attitude from OD is controversial. Belief in God and after-life was reported to be associated with negative attitude towards OD [34,35]. On the other hand, a survey conducted on Swiss-Italian young adults reported positive impact of belief in God on their attitude to OD [36]. A report from United Kingdom (UK) stated no significant association between religion and attitude for OD [19]. Some authors reported differential effects among different religious beliefs on the attitude from OD [18]. Belief in resurrection or reincarnation necessitating the importance of body integrity after death as in Confucian and Buddhist values has a negative impact on organ donation [37,38]. There are no available studies on the effect of agnosticism, secularism and atheism on attitude from OD.

With the exception of Jehovah's Witness, no religion prohibits donation or receipt of organs from deceased or living donors [39]. Many

Islamic scholars and organizations had issued Fatwas in favor of organ donation [40,41]. Deceased and living donor organ donation is allowed and practiced in many Islamic countries as Saudi Arabia and Pakistan [40]. Despite that, Muslim students had an increased likelihood of negative attitude from OD. Also, refusal of OD among students with negative attitude in our study was justified by religious prohibition in 19% of the students. This is concordant with a study from Pakistan, a large Islamic population, which stated that the most frequent cause of refusal of OD was due to religious forbiddance [12].

Inadequate knowledge and vague conception of brainstem death always had a negative effect on OD [24]. A substantial proportion (up to 40%) of refusal of OD in European students was due to lack of confidence of doctors' reliability to diagnose brainstem death [31,35-37]. A survey on Sweden ICU nurses highlighted that they didn't trust brain death diagnosis [42]. Although the overall adequate knowledge was in 36% of medical students, it decreased to 11.7% when estimating the percentage of students with adequate knowledge on brainstem death. This indicates vagueness and mistakes in the conception of brainstem death among medical students and hence the general population.

Many reports concluded that female gender was significantly associated with positive attitude towards OD [13,24, 43]. On the contrary, Boulware et al. reported that young males with higher education showed better attitude towards OD [44]. In this survey, there was no significant association between knowledge and attitude towards OD and student gender or residence. This was also demonstrated by previous reports [12,29].

One of the limitations of this study is its confinement to a single university which mandates studies from other universities to generalize the results. Another limitation was the low percentage (4.7%) of Christian students in the study population which rendered it difficult to draw a definitive conclusion regarding the effect of religion on the knowledge and attitude from OD. The last limitation was computation of a score for student knowledge and attitude based on the answers to a set of questions, but the objective nature of the questions renders this score a fairly plausible estimate in absence of standardized questionnaire to assess the knowledge and attitude of medical students towards OD.

## Conclusion

Many strategies can help improve knowledge and attitude towards OD among Egyptian medical students. These strategies can be generalized to other countries. The medical curriculum must highlight and focus on the importance of OT, the value of OD for the patients and the concept of brainstem death [6]. Others educational tools including lectures, campaigns, advertisements and exhibitions will raise awareness and improve attitude towards OD among the medical students [10]. Maximum effect from educational program requires its presentation in a religiously and culturally accepted background [45]. Exposure of medical students to patients suffering from the shortage of donor organs will improve their attitude [5]. Transplantation experts can play a major role in addressing the problem and clarifying the need and the benefit of OD for the patients [23]. Lastly, Mass media must explain and broadcast the legislative laws controlling the process of OD in the state.

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