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# Changing Attitudes of Medical Students Regarding Organ Donation from a University Medical School in Turkey

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**Background:** Doctors have an important role in increasing the number of organ donors. This study aimed to investigate the changing attitudes of medical students regarding organ donation, from first-year medical students (FYMS) to sixth-year medical students (SYMS) at a university medical school in Turkey.





**Material/Methods:** One hundred first-year medical students and 100 sixth-year medical students participated in the study. A four-part questionnaire was designed for the study, with a response rate of 66.8%.

**Results:** Completed study questionnaires showed that organ donation was considered by 46% of first-year medical students and 60% of sixth-year medical students, but an organ donor card was signed by only 8% and 10%, respectively. Information about organ donation had been sought, mainly from social media, by 72% of first-year medical students, and 55% of sixth-year medical students. Regarding their views on organ donation of their relatives, 78% of first-year medical students and 86% of sixth-year medical students were influenced by the opinions of their families and community. When asked about brain death, 50% of first-year medical students and 12% of sixth-year medical students believed it to be a potentially reversible condition, or were uncertain of the definition.

**Conclusions:** During six years of training in a university medical school in Turkey, there was only a slight increase in the number of students who were willing to become organ donors and there was a lack of formal education regarding organ donation. Therefore, urgent improvements are required in the education of doctors and society regarding organ donation.

**MeSH Keywords:** **Directed Tissue Donation • Education, Medical, Undergraduate • Students, Medical**

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## Background

Organ transplantation has become a life-saving and life-enhancing treatment modality for patients with end-stage organ failure. However, although the rate of organ transplantations has been increasing worldwide, the demand for organs for transplantation remains unmet [1,2]. Worldwide, due to the lack of organ donors, expanded donor criteria are now being implemented, and potential donors with underlying or past conditions that were previously considered to be contraindications are now being used included as organ donors [3,4]. However, there is an increasing demand for available organs for transplantation that is still not being met. Therefore, further improvements are urgently needed so that more people are encouraged to donate their organs.

The opt-in system is used for organ donation in Turkey. A person must declare their willingness to donate their organs in order to become an organ donor. The law on tissue and organ donation in Turkey was established in 1979, which was one of the first countries to formalize its laws on the subject of organ donation, with amendments being made in 1982 and 2014 [5]. The Ministry of Health in Turkey established the National Coordination Center and related Science Boards in 2001, and there are now nine national tissue and organ coordination centers organized according to geographic region, with organ delivery organized by the Ministry of Health. The first successful living organ transplant was performed in 1975 and the first cadaveric organ transplant was performed in 1979 at the university hospital where the present study was conducted. Turkey is currently the country with the most live organ donors in the world, with the donor rate per million population being 47.5 in 2017 [6]. However, the cadaveric organ donation rate per million population was low at only 7 [6]. Although the number of live organ donations has increased in recent years, there remains a shortage of cadaveric organ donation in Turkey where, according to 2018 national health statistics, more than 25,000 patients are waiting for an organ transplant [7].

In the past, most healthcare initiatives have been successful due to a combination of the strong support of physicians and the provision of health information to the public. The medical profession could be role models to society by demonstrating their willingness to donate their organs for transplantation and to carry organ donor cards, and they should be expected to be able to clearly and precisely inform patients and their family members about organ donation. The reasons for negative opinions and attitudes of doctors regarding organ donation need to be identified in order to improve their training, starting in the first years of medical school.

Therefore, the aim of this study was to show the changing attitudes of medical students regarding organ donation as they progressed from first-year medical students (FYMS) to sixth-year medical students (SYMS) at our university medical school in Turkey. The impact of medical education on these attitudes was investigated by comparing first-year and sixth-year medical students.

## Material and Methods

### Study design and participants

Approval for this study was obtained from the Non-Interventional Clinical Research Ethics Board of Hacettepe University, Turkey and was conducted during the academic year 2012–2013. A study questionnaire was used, and the clarity and comprehensibility of the questions were tested with a group of 20 medical students that included 10 first-year medical students (FYMS) and 10 sixth-year medical students (SYMS) before the start of the study. The responses of these students were excluded from the main study.

The study questionnaire was given to first-year medical students after a class unrelated to organ donation, and to sixth-year medical students during a compulsory emergency medicine internship. The response rate was 66.8%. A student from the first-year medical student group was excluded from the study because of missing data in the questionnaire responses.

### Design of the study questionnaire

There were four parts to the study questionnaire. The first part of the questionnaire was designed to determine the means of obtaining information about organ donation and the influence of that information on the opinions of the medical students. The second part of the questionnaire was designed as a self-assessment of the level information that the medical students received about organ donation and brain death. The third part of the questionnaire was designed to determine the attitudes of the medical students regarding organ donation.

The fourth part of the questionnaire was designed to investigate the underlying reasons for the opinions and behaviors of the medical students regarding organ donation.

### Statistical analysis

Data were analyzed using SPSS version 17: 00 (SPSS, Chicago, IL, USA). Data were presented as percentages and means. Differences between the groups were determined by the chi-squared ( $\chi^2$ ) test. A p-value <0.05 was accepted as statistically significant.

**Results**

One hundred first-year medical students (FYMS) and 100 sixth-year medical students (SYMS) participated in the study. There were 43 men and 57 women in the first-year medical student group, and 56 men and 44 women in the sixth-year medical student group. The mean ages were 17.6 years among the first-year medical students and 24.2 years among sixth-year medical students. The response rate to the questionnaire was 66.8%.

The sources of information about organ donation and the effect of that information source on the opinions of both groups of medical students are shown in Table 1. Taking theoretical classes, participating in meetings and education programs and getting information from media, television and internet positively affected the opinions of sixth-year medical students ( $p < 0.05$ ).

Tables 2–4 compare the answers of first-year medical students and sixth-year medical students to investigate the effect of medical education on their knowledge and attitudes to organ donation. Thirty percent of first-year medical students and 55% of sixth-year medical students believed that their current knowledge concerning organ donation was adequate. However, regarding the definition of brain death, 60% of first-year medical students and 90% of sixth-year medical students stated their knowledge to be sufficient (Table 2). There was a significant difference between the two groups ( $p < 0.01$ ).

Only 8% of first-year medical students and 10% of sixth-year medical students signed an organ donor card ( $p = 0.805$ ). All sixth-year medical students that signed an organ donor card stated they went through theoretical training in medical school. Organ donation had been previously considered by 46% of first-year medical students and 60% of sixth-year medical students. The willingness to donate their organs was significantly greater in sixth-year medical students compared with first-year medical students ( $p = 0.033$ ). There were 32% of first-year medical students and 35% of sixth-year medical students who stated that they were willing to consent to donate the organs of their relatives in cases of their brain death ( $P < 0.764$ ) (Table 3).

Significantly more first-year medical students stated that brain death was a reversible clinical situation or that they were uncertain about the definition of brain death when compared with sixth-year medical students (50% and 12%, respectively). In 96% of first-year medical students and 92% of sixth-year medical students, organ donation was perceived to be consistent with religious beliefs ( $p = 0.372$ ). The process of organ removal with the associated changes to the donor’s body was an influential factor concerning organ donation for 11% of first-year medical students and 7% of sixth-year medical students

**Table 1.** Medical students’ sources of information about organ donation and the effect of information source on their opinions.

	FYMS (n)	SYMS (n)
<b>Taking theoretical lessons</b>	–	66
– positive effect	–	<b>48</b>
– negative or no effect	–	<b>18</b>
– negative effect	–	–
– no effect	–	18
p		<b>&lt;0.001</b>
<b>Observation of the diagnosis of brain death</b>	2	45
– positive effect	2	<b>18</b>
– negative or no effect	–	27
– negative effect	–	2
– no effect	–	25
p		0.180
<b>Participation in meetings and education programs</b>	21	58
– positive effect	<b>10</b>	<b>42</b>
– negative or no effect	<b>11</b>	<b>16</b>
– negative effect	–	–
– no effect	11	16
p	0.827	<b>0.001</b>
<b>Getting information from the media, television and internet</b>	72	55
– positive effect	<b>32</b>	<b>36</b>
– negative or no effect	<b>40</b>	<b>19</b>
– negative effect	10	3
– no effect	30	16
p	0.346	0.022
<b>Visiting organ donation centers</b>	24	22
– positive effect	<b>16</b>	<b>13</b>
– negative or no effect	<b>8</b>	<b>9</b>
– negative effect	–	–
– no effect	8	9
p	0.102	0.394

FYMS – first year medical students; SYMS – six year medical students.

( $p = 0.459$ ). The prevalence of lack of support for the transplant process was found to be higher in the sixth-year medical students compared with the first-year medical students (27% and 6%, respectively). In making decisions concerning the donation of the organs of their relatives, the opinions of other relatives and the community was considered to be important in 78% of first-year medical students and in 86% of sixth-year medical students ( $p = 0.198$ ) (Table 4).

**Table 2.** Medical students' self-assessment of the level their information about organ donation and brain death.

	FYMS (n)	SYMS (n)	P
<b>Their information about organ donation</b>			
– sufficient	30	55	<b>&lt;0.001</b>
– insufficient	70	45	
<b>Their information about brain death</b>			
– completely sufficient	60	90	<b>&lt;0.001</b>
– partially sufficient	30	10	
– insufficient	10	–	

FYMS – first year medical students; SYMS – six year medical students.

**Table 3.** Attitudes of medical students concerning organ donation.

	FYMS (n)	SYMS (n)	P
<b>Owns an organ donation card</b>	8	10	0.805
<b>Does not have organ donation card</b>			
– willing to donate their organs	46	60	<b>0.033</b>
– unwilling to donate their organs	16	14	
– ambivalent	30	16	
<b>In case of the brain death of their relatives</b>			
– considering donating their relatives' organs	32	35	<b>0.764</b>
– not considering donation	45	25	
– ambivalent	23	40	

FYMS – first year medical students; SYMS – six year medical students.

## Discussion

Doctors who diagnose and treat patients and who provide palliative care should be well informed about the organ donation and organ transplant process and with current guidelines on organ donation. Even among physicians working in emergency services and intensive care units, which are important sources for organ donors, there may be a lack of knowledge necessary to identify and refer potential donors and to communicate with the families of potential donors [8,9]. Informing and raising awareness about organ donation should begin in the first years of medical school, as junior doctors who will work in different clinical fields should be able to encourage organ donation and set an example for the public. Therefore, the opinions and behaviors

**Table 4.** The reasons of thoughts about organ donation of medical students.

	FYMS (n)	SYMS (n)	P
<b>Can brain death be reversed?</b>			
– yes	36	9	<b>&lt;0.01</b>
– no	50	88	
– ambivalent	14	3	
<b>Is organ donation consistent with your beliefs?</b>			
– yes	96	92	0.372
– no	–	2	
– ambivalent	4	6	
<b>Do your other relatives' and the community's opinions affect your opinion about organ donation of your relatives?</b>			
– yes	78	86	0.198
– no	22	14	
<b>Do you trust the organ transplantation process?</b>			
– yes	94	73	<b>&lt;0.01</b>
– no	6	27	
<b>Does the violation of bodily integrity affect your decision?</b>			
– yes	11	7	0.459
– no	89	93	

FYMS – first year medical students; SYMS – six year medical students.

of doctors concerning organ donation and transplantation and the reasons for these opinions should be investigated [10–23].

The findings of the present study showed that concerning the definition of brain death, 60% of first-year medical students (FYMS) and 90% of sixth-year medical students (SYMS) stated their knowledge to be sufficient. However, a significant number of first-year medical students and sixth-year medical students stated that brain death was potentially reversible (36% and 9%, respectively); there were 14% of first-year medical students and 3% of sixth-year medical students who were undecided about this question.

Previous studies have shown that medical students were not adequately informed about brain death. In a study from Rios et al., 28% of medical students did not understand the concept of brain death, and 5% stated that brain death was not a sign of death, but was a potentially recoverable situation [16]. A study published by Fontana et al. showed that 15.3% of medical school students stated that the information about donation and transplantation that they received in their classes in medical school was sufficient, but 41.9% stated that they did

not know the difference between brain death and persistent vegetative state [18]. In a study that included medical, law, theology, nursing and communication students, Kocaay et al. reported that 7.1% of the students believed that it was possible to recover from brain death [19]. Figueroa et al. reported that 74.7% of medical students rated their level of knowledge about organ donation as very good or good, and 46.2% defined brain death correctly [10]. A study by Naçar et al. found that 40.5% of medical students knew that there was a difference between brain death and persistent vegetative state [23].

The main reasons for lack of organ donation include the lack of detection and reporting of cases of brain death and that family members of the potential donor do not agree to donate the organs [24–27]. One of the reasons why family members do not donate organs is that they do not understand brain death [26]. For junior doctors, the belief that brain death is a potentially reversible situation will negatively affect their attitudes about organ donation and the advice they give to relatives of potential organ donors.

In the present study, of the sixth-year medical students, 66% stated that they took one hour to four hours of classes about organ donation and transplantation during their time at medical school. All of the sixth-year medical students who signed an organ donor card had taken these classes. The current curriculum organized by the university medical school faculty where this study was conducted consisted of a 40-minute theoretical class about the topic for the fourth-year medical student compulsory general surgery and the fifth-year compulsory urology clerkships. Also, theoretical classes related to brain death and organ donation were included in three elective clerkships. All of the medical students included in the study were students at the same medical school, and it is possible that some of these students did not attend these classes, or did not remember them. Anker et al. conducted a survey of 54 medical schools and 50 nursing schools in the United States and identified several deficiencies in training related to organ donation in most medical schools regarding topics such as live organ donation and consent for organ donation [28]. More recent studies conducted in several countries now support that there is inadequate information on organ donation and transplantation in medical schools and that the medical curriculum needs to be reviewed [11–19,21–23,29].

Adequate information should be provided on issues such as organ donation and brain death starting from the first years of medical school before any negative attitudes regarding organ donation develop. Future faculty members who plan the curriculum of medical schools should also acknowledge how training is provided. The use of active learning methods, supplementary materials, discussion of the topic on patient ward rounds, and topic training with small groups can all be useful

in increasing the knowledge and motivation of medical students [14,29,30].

The findings of this study showed that there was a difference between what medical students stated and how they acted, as although most students claimed that they were willing to donate their organs, few of them had registered as donors. This contradiction has been previously reported in the literature. Figueroa et al. reported that the willingness of medical students to donate their organs was found to be 80% [10]. Nacar et al. reported that the willingness of medical students to donate their organs was 50% [23]. However, organ donor card ownership rates were 59% in the former study and 3.4% in the latter [10,23]. In a study conducted by Symvoulakis et al., the rate of medical students who were willing to donate their kidneys was 58.7%, while 8.7% of them carried a donor card [17]. In the study by Fontana et al., 97.8% of medical students claimed to be in favor of organ donation, but 24.9% were registered as donors [18]. Of the 1,542 medical students from 104 different countries who had not yet donated their organs who participated in a study by Sahin et al., 23.4% stated that they were undecided, but 60% stated they considered donating their organs in the future [11]. These results show that the high rates of reported willingness to donate organs are misleading, as failure to act on these stated views show that the real attitudes of students may be negative. With sufficient information and appropriate training, the motivation of these medical students could become more positive and increased.

Previous studies have shown that cultural and religious beliefs were important additional factors in influencing decisions about organ donation [11,12,15,17,19,23]. In the study by Kocaay et al. in Turkey, organ donation was perceived to be consistent with religious belief for most students as 68.6% found organ donation compatible with religious beliefs, while 24.6% of the students were uncertain [19]. A study by Nacar et al., which was also conducted in Turkey, showed that 19.8% of medical students were against organ donation for religious reasons [23]. In the present study, participants were not asked about their views on religion, but a high percentage of the population of Turkey is Muslim. Although there are variations in different countries and sects, organ donation is generally considered compatible with Islam as it is perceived to be an act of benevolence and kindness [31,32]. A statement on the religious views on organ donation and transplantation in Turkey was made by the Directorate of Religious Affairs in 1980 [33]. According to this statement, when necessary, organ transplants are acceptable if the donor is dead and consent has been given [33].

In the published literature, the process of organ retrieval with disruption of the integrity of the body and lack of belief in the clinical value of organ transplantation were stated as the causes of the negative opinions regarding organ

donation [11,17,23,34,35]. Compared with other reasons, these previously reported factors were found to be less influential in the present study, but mistrust of the organ transplantation process in sixth-year medical students was 4.5 times greater than first-year medical students. This finding might be due to a previous unsuccessful limb transplantation that was attempted in the hospital in 2012.

This study showed that, like first-year medical students, sixth-year medical students (55%) obtained information about organ donation from the print and social media, the internet, and television. The source of information about organ donation for medical students was shown to be 64.6% from the media in a study conducted by Ali et al. [15], and 34% from social media and 22.5% from television in a study by Sayedalamin et al. [12]. In a survey conducted by Kocaay et al., 81.8% of the students who participated thought that media campaigns on organ donation and transplantation could increase organ donations [19]. The use of media channels influences the opinions and attitudes of both healthcare staff and of society. For example, in Poland in 2007, following negative news about transplantation in the media, the number of organ donations significantly decreased [36]. After Facebook changed its platform to allow people to specify their organ donor status as a part of their profile in May 2012, in the US the number of people who donated their organs increased by 21-fold in one day and the effect lasted for several weeks [37]. The use of social media should be used more efficiently to expand the donor pool, with combined social and general media and cooperative campaigns and publications to encourage people to donate their organs.

In this study, there was a 14% increase in willingness to donate organs and a 2% increase in carrying organ donation cards during the six years of medical school education. Although education is necessary for behavioral change, the knowledge gained during medical training may not be implemented in professional practice. Organ donation is a complex issue that includes religion, law, ethics, and social value judgments. The attitudes of doctors affect the attitudes of society, but doctors will also have values and beliefs that arise from the culture they work in and the society in which they live. The literature supports the finding from this study that for young doctors and medical students, their attitudes to organ donation were affected by the opinions of their family

and community [12,38]. It has also been previously reported that doctors do not feel comfortable talking about organ donation [38]. In a society that does not have positive opinions regarding organ donation, talking about organ donation will increase stress and unease of doctors. Because of the interactions between the medical profession and society, positive attitudes in one will also affect the other.

This study had several limitations. The medical students in the study were from only one university that offers medical education in Turkish. There is also a medical faculty that offers medical education in English at the same university. There is the possibility that the survey results might have been different if both Turkish-speaking and English-speaking medical students had been included. There is also the possibility of interaction between students when answering questions in the questionnaire.

## Conclusions

In this study, during six years of training in a university medical school in Turkey, there was only a slight increase in the number of students who were willing to become organ donors and there was a lack of formal education regarding organ donation. Improvements are required in the education of doctors and society regarding organ donation. In the medium-term and long-term, physician leaders could make significant contributions to the increase in organ donation and transplantation rates. Therefore, it is important to determine the causes of negative opinions and behaviors of young doctors related to brain death and organ transplantation and correct any lack of knowledge. Efforts to inform the public and to raise awareness of organ donation should be improved. For both doctors and society, changing any negative attitudes about organ donation will not be a quick or easy, but could be supported by the use of modern methods of communication, including print and social media, television, the internet, and meetings. These important issues should be continually reviewed and improved as the demand for organs for transplantation continues to increase.

## Conflict of interest

None.

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