Evaluation of the knowledge level of Faculty of Dentistry students about organ transplantation and donation

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ABSTRACT
The aim of this study is to evaluate the knowledge level of the dentistry students about organ transplantation and donation. A data collection questionnaire was applied to measure the level of knowledge about organ transplantation to 250 students studying at Dicle University Faculty of Dentistry. The questionnaire form was prepared with a total of 30 questions by checking the literature. The data obtained in this study were analysed with IBM SPSS Statistics Version 21 and evaluated with descriptive statistics and percentage analysis. The obtained results showed that 67.2% of the students participating in the study stated that they wanted to donate organs, 84.4% supported organ donation, and 76.8% did not find the level of knowledge about organ donation sufficient. Among the participants, 46% of them stated that they had received the information about organ donation from school-textbooks and seminars. In our research, 95.6% of the students stated that they do not have an organ donor identity card, 87.2% of them have no relatives or people around them who donate organs. Although the majority of the students found organ donation necessary, they abstained from donating for different reasons. We believe that information on the subject should not be limited to schools but should be conveyed to the whole society and more effective methods should be followed.

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Introduction
The inability to find a suitable donor for patients who can recover with organ or tissue transplantation remains an important problem all over the world. Because of insufficient organ and tissue donation, thousands of people die each year due to organ failure [1]. The decision of organ donation is made by the individual’s own free will and documenting this while living, or by the decision of his/her relatives on his/her behalf. In addition, organ transplantation is the replacement of a damaged organ or tissue with a healthy organ or tissue taken from a living donor who has agreed to donate or a person with brain death [2–6].

Organ donation and transplantation are two concepts that complement each other. Donated organs or tissues are transplanted to the most suitable person among the waiting list [7]. In organ transplantation, it is essential to protect the health of the recipient and donor. In Turkey, organs such as heart, lung, kidney, liver and pancreas, heart valve, corneal layer of the eye, muscle and bone marrow can be successfully transplanted [8].

One of the most important problems encountered in organ and tissue transplantation is the adaptation problem. In order for organ transplantation to be performed, the donor’s brain death must occur in the intensive care environment and the tissues must be compatible with the recipient’s tissues. Basic issues such as who can detect brain death, which relatives can be approved for organ donation, and under what conditions organ transplantation can be performed have been legally regulated all over the world [3, 9, 10].

In Turkey, a National Organ and Tissue Transplant Coordination System was established in order to increase the applicability of the ‘Organ and tissue removal, storage and transplantation law’ dated 1979 and numbered 2238, and cooperation between institutions was established. Under the relevant law, an ‘Organ Donation Certificate’ was prepared for those who would like to donate organs, and the organs to be donated are left to the choice. When the donation is withdrawn, it is sufficient for the donor to share his/
her decision with his/her relatives and remove the document [3].

Serious progress has been made in organ transplantation, thanks to the technological developments in recent years and the increased sensitivity of people to organ donation. However, factors such as the literacy rate, socio-economic situation, moral understanding, religious belief and cultural structure shaped by traditions play a key role in organ donation in Turkey as well as in the whole world [1, 11, 12]. An example of this is the common and false belief that Islam does not allow organ transplantation [12]. In parallel with the developments in medicine, the transplantation of some organs taken from animals to humans has come to the fore, but it was not deemed appropriate legally and ethically [13].

According to official data between the years of 2002 and 2018, while the total number of volunteer donors was 453,915, only 7,405 transplantations could be carried out in Turkey. Although in 2018, 100,297 people were voluntary donors, the number of people waiting for organs was determined as 28,272 [14]. Although the number of donations has increased compared to previous years, it is seen that it has not reached the sufficient level yet. It is of great importance that healthcare professionals who are in close contact with the public enlighten the public sufficiently about this issue as role models.

Based on the view that university students will represent the view of different segments of the society on organ and tissue donation, we applied a data collection questionnaire to 250 students studying at the Dentistry Faculty. We aimed to evaluate the knowledge level of the participants about organ transplantation and donation.

Subjects and methods

Ethics statement

Ethics Committee Approval was obtained with protocol number 2019/17 at the meeting of the Ethics Committee of Dicle University Faculty of Dentistry dated 29th May 2019 and numbered 6/2. Informed consent form was obtained from the participants.

Participants and questionnaire design

The data collection questionnaire was conducted to evaluate the knowledge level and attitudes of 250 students who were studying at Dicle University Faculty of Dentistry and volunteered to participate in the study on organ donation and transplantation. The questionnaire form prepared by conducting a literature review includes a total of 30 questions, 9 of which investigate the descriptive characteristics of students and 21 questions about organ donation. The questionnaire was administered by face to face interview.

Data analysis

The data obtained in the study were analysed with IBM SPSS Statistics Version 21 package program. The number and percentage rates were specified with frequency analysis for the variables related to the study.

Results and discussion

Descriptive statistics

The descriptive characteristics of the students who participated in the study are shown in Table 1, and the distribution of the answers given to the questions determining the level of knowledge and attitude towards organ transplantation is shown in Table 2. In the preparation of the tables, the question-answer order has been used.

The participants in the study were mostly 1st year students (57.6%), single (96%), with a 2000–4000 TL income level (38.4%), living in the city center (73.6%); 56.4% were men and 43.6% were women. The education level of the parents was mostly at the primary school level (mother: 74.8% and father: 48.8%). It was observed that 75.2% of the participants had health insurance.

In the second part, 84.4% of the participants supported organ donation and 67.2% thought to donate their organs after death but 71.6% of them had not even donated blood before. It is understood that 3.8% of the participants have family members with chronic diseases, 46% have obtained their information about organ donation from school-textbooks and seminars, and 76.8% consider their knowledge level about organ donation insufficient. Although the rate of those who want to donate all their organs after death is 47.2%, it was determined that 95.6% of them did not have an organ donor identity prepared by any institution. The ratio of those who answer ‘no’ to the 19th question is 40%, which can be regarded as an expression of indecision.

Although the rate of those who answered ‘yes’ to the 21st question is 80.4%, it is understood that 87.2% of the participants do not have organ donors in their social circle. In addition, 40.4% of the students think that those who refuse to donate their organs due to their religious belief also should be automatically
removed from the list of patients waiting for transplantation, even if they need it. While 34.8% of the participants defend the idea that the state should make organ donation mandatory with a law, 32% of them think that organ transplantation is an experimental method.

While a great majority (87.2%) stated that the organisations made for organ transplantation and donation in Turkey are not sufficient, 58% think that increasing the social education about organ donation will have a positive effect. While 54.4% of the participants stated that organ donations can be made to university hospitals, 55.6% stated that the most important factor affecting their opinions about organ donation was the idea of ‘helping someone else survive after I die’. While 2.8% of the students find it sufficient to have the approval of their doctor to be able to donate organs, only 76% of them know that tissue compatibility is required for organ donation.

**Implications**

Many untreatable diseases can be cured by organ and tissue transplantation. The main goal in organ donation is to make the donor’s free will. However, the recipient should also be informed about all issues, especially the operation to be performed. The obligation to enlighten in this regard belongs to physicians [3].

Despite the legal regulations on organ donation and transplantation have been made in Turkey. During this period, in studies conducted on university students both in here and abroad, it was observed that the rate of obtaining information about organ donation and transplantation varied between 42.5% and 86.5% [3].

Cantwell et al. [9], Esman et al. [10], Dutra et al. [15] determined that 74% of nursing students, 80% of first and second year medical faculty students in the USA, and 69.2% of medical faculty students in Brazil have organ donation cards. Kavurmacı et al. [16] observed that 47.8% of the participants thought of donating organs, but only 4.2% of them had donation cards in their study on 921 university students studying in health, social and science departments of different faculties. It was emphasized that the students did not have enough information about organ transplantation and donation [16]. Yazıcı et al. [4] found that 50.3% of 352 students studying in the nursing department of a health college thought of donating their organs, but only 9.9% of them had organ donation cards. While 77% of the students found the information given on the subject insufficient, 30.1% emphasized that they did not know what to do. The authors stated that training for organ donation increased the level of knowledge about donation and the willingness to donate [4].

Magazacı et al. [17] reported that the support given to organ donation was high, but 97.4% of the participants did not have an organ donation card. Soysal and Kaya [11] conducted a study to determine the knowledge and behavior levels of 118 health
Table 2. Answers given to questions measuring the knowledge level and attitudes towards organ donation.

| No. | Questions                                                                 | Answers                                                                 | N (%)       |
|-----|---------------------------------------------------------------------------|------------------------------------------------------------------------|-------------|
| 10  | Is there anyone in your family with a chronic illness?                    | Yes                                                                    | 77 (30.8%)  |
|     |                                                                           | No                                                                     | 173 (69.2%) |
| 11  | Have you donated blood before?                                            | Yes                                                                    | 71 (28.4%)  |
|     |                                                                           | No                                                                     | 179 (71.6%) |
| 12  | Where did you get your information about organ donation?                  | From school-textbooks-seminars                                         | 115 (46%)   |
|     |                                                                           | Social environment                                                     | 82 (32.8%)  |
|     |                                                                           | Radio-TV                                                               | 24 (9.6%)   |
|     |                                                                           | From organ donation center-health institutions                          | 14 (5.6%)   |
|     |                                                                           | Other                                                                  | 15(6%)      |
| 13  | Do you find your knowledge about organ donation sufficient?               | Yes                                                                    | 58 (23.2%)  |
|     |                                                                           | No                                                                     | 102 (76.8%) |
| 14  | Do you generally support organ donation?                                  | Yes                                                                    | 211 (84.4%) |
|     |                                                                           | No                                                                     | 39 (15.6%)  |
| 15  | Do you plan to donate your organs after your death?                       | Yes                                                                    | 168 (67.2%) |
|     |                                                                           | No                                                                     | 82 (32.8%)  |
| 16  | Which organs do you think can be donated?                                 | Kidney, Liver, Eyes, Heart, Lungs                                      | 29 (11.6%)  |
|     |                                                                           | Kidney, Liver, Heart, Cornea                                            | 39 (15.6%)  |
|     |                                                                           | Kidney, Liver, Lungs, Pancreas                                          | 3 (1.2%)    |
|     |                                                                           | Liver                                                                  | 156 (62.4%) |
|     |                                                                           | Eyes                                                                    | 3 (1.2%)    |
|     |                                                                           | Heart                                                                  | 4 (1.6%)    |
|     |                                                                           | Cornea                                                                  | 6 (2.4%)    |
|     |                                                                           | None                                                                    | 3 (1.2%)    |
|     |                                                                           | All                                                                     | 9 (2.8%)    |
| 17  | Which organs would you like to donate after you die?                      | Kidney, Liver, Eyes, Heart, Lungs                                      | 8 (3.2%)    |
|     |                                                                           | Kidney, Liver, Heart, Cornea                                            | 7 (2.8%)    |
|     |                                                                           | Kidney, Liver, Lungs, Pancreans                                         | 38 (15.2%)  |
|     |                                                                           | Liver                                                                  | 4 (1.6%)    |
|     |                                                                           | Eyes                                                                    | 2 (0.8%)    |
|     |                                                                           | Heart                                                                  | 17 (6.8%)   |
|     |                                                                           | Cornea                                                                  | 1 (0.4%)    |
|     |                                                                           | None                                                                    | 55 (22%)    |
|     |                                                                           | All                                                                     | 118 (47.2%) |
| 18  | Do you have an organ donor ID prepared by any institution?                | Yes                                                                    | 11 (4.4%)   |
|     |                                                                           | No                                                                     | 239 (95.6%) |
| 19  | Do you state that you donate your organs with any identity card?         | Yes                                                                    | 150 (60%)   |
|     | Should this decision be considered your final decision after your death? | No                                                                     | 100 (40%)   |
| 20  | Have any of your relatives donated organs?                                | Yes                                                                    | 32 (12.8%)  |
|     |                                                                           | No                                                                     | 218 (87.2%) |
| 21  | What would your answer be if you had to decide on the donation of organs  | Yes                                                                    | 201 (80.4%) |
|     | after the death of a first-degree relative who declared donating his/her| No                                                                     | 49 (19.6%)  |
|     | organs while living?                                                      |                                                                         |             |
|     |                                                                           |                                                                         |             |
|     | Should people who refuse to donate their organs for religious beliefs be | Yes                                                                    | 101 (40.4%) |
|     | automatically removed from the list of patients awaiting transplant when | No                                                                     | 149 (59.6%) |
|     | they needed?                                                              |                                                                         |             |
| 23  | Do you think the state requiring organ donation with a law?               | Yes                                                                    | 87 (34.8%)  |
|     |                                                                           | No                                                                     | 163 (65.2%) |
| 24  | Do you think organ transplantation is an experimental method?              | Yes                                                                    | 80 (32%)    |
|     |                                                                           | No                                                                     | 170 (68%)   |
| 25  | Do you find the organisations for organ transplantation and donation      | Yes                                                                    | 32 (12.8%)  |
|     | sufficient in your country?                                               | No                                                                     | 218 (87.2%) |
| 26  | What is the most important factor affecting your opinion on organ         | My religious belief                                                     | 29 (11.6%)  |
|     | donation?                                                                 | I find it appropriate for my body to remain intact after I die         | 45 (18%)    |
|     |                                                                           | I want to help someone else survive after I die                        | 139 (55.6%) |
|     |                                                                           | If I die in a tragic event, I think the donation of my organs will reduce my family's grief | 8 (3.2%) |
|     |                                                                           | Among my relatives, I was impressed by one of my relatives who got hold of life again with organ transplantation | 5 (2%) |
|     |                                                                           | None                                                                   | 24 (9.6%)   |
| 27  | If all legal security measures are taken, which of the following will have | Providing direct financial assistance for donation                      | 71 (28.4%)  |
|     | a positive effect on the organ donation rate?                            | Increasing social education on organ donation                          | 145 (58%)   |
|     |                                                                           | Increasing organ donation coordinators in hospitals                    | 34 (13.6%)  |

(continued)
management students about organ donation, and reported that 83.1% of the participants had positive opinions about organ donation, but only 5.1% had donated their organs. In a study conducted by Polat et al. [18] on nursing students, 68.9% of the participants stated that they did not have enough knowledge about the law on organ donation, and 53.8% stated that they were not given sufficient information during their undergraduate education; 68.4% stated that they do not know where to apply for donation. Nacar et al. [19] examined the knowledge and attitudes of senior medical faculty students about organ transplantation and found that there was a significant lack of information among the participants.

Kocak et al. [20] reported that medical faculty students know what to do when donating organs, but they will donate their organs only when a family member needs them. Uzuntarla et al. [21], in a survey of 113 vocational high school students, stated that education largely eliminated the students’ lack of knowledge about organ donation. Fuel et al. [22] stated that most of the health services vocational school students were keen on organ donation, but 61.2% did not know the conditions required for donation. In a study conducted by Ertas et al. [23] with 300 healthcare professionals working in a public hospital, 54% of the participants stated that the studies on organ transplantation and donation were not adequately announced to healthcare professionals.

In our study among dentistry students, although 84.4% of the participants supported organ donation, in line with other studies conducted in Turkey, only 4.4% had attempted to donate their organs. In Turkey, the number of people with organ donation cards is lagging behind in comparison to other countries. While 76.8% of the students consider their knowledge on organ donation insufficient, 58% think that increasing the social education about organ donation will have a positive effect. This opinion reveals the importance of spreading information about organ donation and transplantation.

In a study by Kılıçarslan et al. [24] with 294 students, the question: ‘What is the most important factor affecting your opinion on organ donation?’, was answered by 47.5% of the students as follows: ‘I want to help someone else survive after I die’. In our study, this rate was determined as 55.6%. We believe that the contradictory situation between intent and behavior stems from false beliefs about organ donation, lack of knowledge and empathy.

It is understood from the studies conducted in Turkey that students access information about organ donation and transplantation mostly from the media and press. As a result of the survey conducted by

### Table 2. Continued.

| No. | Questions                                                                 | Answers                                                                 | N (%)  |
|-----|---------------------------------------------------------------------------|-------------------------------------------------------------------------|--------|
| 28  | In which centres do you think organ donation can be made?                 | Family medicine center 23 (9.2%)                                        |        |
|     |                                                                           | Private clinics 18 (6.4%)                                               |        |
|     |                                                                           | State hospitals 51 (20.4%)                                              |        |
|     |                                                                           | University hospitals 136 (54.4%)                                       |        |
|     |                                                                           | Provincial health directorate 18 (8%)                                   |        |
|     |                                                                           | Other 4 (1.6%)                                                          |        |
| 29  | Do you think tissue compatibility is necessary for organ donation?         | Yes 190 (76%)                                                          |        |
|     |                                                                           | No 23 (9.2%)                                                           |        |
|     |                                                                           | No idea 37 (14.8%)                                                     |        |
| 30  | What is required for organ donation?                                       | Identity card with identity information 39 (15.6%)                      |        |
|     |                                                                           | Identity and health report 30 (12%)                                     |        |
|     |                                                                           | Identity, medical report and witnesses 44 (17.6%)                       |        |
|     |                                                                           | Identity, medical report, witnesses and doctor information             |        |
|     |                                                                           | Health report 79 (31.6%)                                                |        |
|     |                                                                           | Medical report, witnesses and doctor information                       |        |
|     |                                                                           | Two witnesses who are relatives of the first degree 18 (7.2%)           |        |
|     |                                                                           | Just my doctor’s information 7 (2.8%)                                   |        |
|     |                                                                           | Other 6 (2.4%)                                                          |        |
| 31  | Under what conditions can organ transplantation be performed from a person who has not requested organ donation before? | Approval of two relatives of the first degree 81 (32.4%)                 |        |
|     |                                                                           | Approval of first-degree relatives and occurrence of brain death 31 (12.4%) |        |
|     |                                                                           | Confirmation, brain death and doctor approval 41 (16.4%)                |        |
|     |                                                                           | Brain death to occur 57 (22.8%)                                         |        |
|     |                                                                           | Hospitalisation in intensive care 8 (3.2%)                              |        |
|     |                                                                           | To be connected to artificial respirator 8 (3.2%)                       |        |
|     |                                                                           | Doctor’s consent 13 (5.2%)                                              |        |
|     |                                                                           | Other 11 (4.4%)                                                         |        |
|     |                                                                           | Total n = 250 (100%)                                                   |        |
Kocak et al. [20] on 171 medical school students, they emphasized that empathy plays a determinant role in making the donation decision and the effect of factors such as internet, TV-radio and social environment is 32.6%. In a survey conducted by Dumanlı et al. [25] with 150 medical faculty students, 70% of the participants got their knowledge about organ donation from their own faculties, and the rest obtained it from family physicians, internet, close relatives-friends and the media.

In our study, 46% of the participants obtained their knowledge about organ donation mostly from school-textbooks and seminars, 32.8% from their social circles, and 9.6% from media sources such as radio-TV. Here, the importance of including organ donation in the curriculum of undergraduate education and at the same time providing continuous and accurate information by the media has been revealed once again. The fact that 32.8% of the participants did not think of organ donation revealed that the awareness of the students about organ donation was low. This situation suggests that the curriculum of the dentistry faculty is insufficient compared to that of the medical faculty. In the curriculum to be given, it is especially important to include basic information about which institution, and which documents the donation will be made with.

Societies’ education level, socio-economic status, morality, culture and belief structures are determining factors in organ donation. In particular, incomplete information and some prejudices are the biggest obstacles to organ donation. Contrary to common belief, people’s opposition to organ donation is generally cultural reasons rather than religious belief [12]. It is a matter of concern that social harmony and awareness are not sufficient in an issue that directly concerns human life such as organ donation and transplantation.

In a study in which Sıpkin et al. [26] evaluated the view of faculty members of medicine, theology and fine arts on organ donation, 53.7% of the participants stated that they wanted to donate organs, but 23.2% of them did not think of donating because they did not trust the healthcare personnel. The rate of those who wanted to receive training on organ donation remained at 45.1%. Kavurmacı et al. [16] reported in their study on 921 university students that the option of ‘disruption of body integrity’ among the reasons for not donating ranked first with 47.4%. This result was evaluated as young students pay more attention to the concept of body image.

Güler et al. [27] drew attention to the lack of knowledge of university students on organ donation and the low rate of donation in their study, where they evaluated the perspectives of university students on organ donation. In the study, 45.1% of the participants stated that they did not want to donate organs because organ donation contradicted their religious beliefs. This rate was 3.4% in the study of Özmen et al. [28] and 17.1% in the study of Celebi et al. [29]. In our study, religious belief was the most important factor affecting the opinion about organ donation of 11.6% of the participants. In the light of all these results, it is seen how important the responsibility of religious officials is in informing the society.

In order for vital organs such as the heart to be taken for donation, the person’s life must have ended. There are two different opinions about the person being considered dead. The first is the idea that death occurs with the last heartbeat and the last breath. The second is that brain death has occurred, which is also the definition accepted in Turkey [3].

Kara et al. [30], in their study among 536 healthcare professionals working in the medical faculty, reported that the majority of the participants pointed out the kidney and liver as organs that could be transplanted. Güler et al. [27] observed that the organs to be donated were listed as kidney, bone marrow and heart. In our study, we see that the first organ perceived to be donated is the liver with a rate of 62.4%. The reason for this result can be attributed to the fact that the majority of those waiting for transplantation are kidney and liver patients or that the transplantation of these organs is the most common issue in the media.

Unfortunately, many patients who are waiting for a suitable organ transplant may die while on the waiting list. It should not be ignored that the treatment costs of patients with serious health problems will be reduced by organ donation and transplantation and thus the social gain to be obtained will increase.

Conclusions

As a result of our study, the importance of education to be given to students studying in the field of health has emerged in order to eliminate the big difference between organ demand and donation rate. It is obvious that education will shed light on those who are hesitant about donation. Education programs, seminars and campaigns should be organized in cooperation with the state, school and media. At this point, healthcare professionals, teachers and religious officials who approach the subject positively have a great duty and responsibility. For this reason, the number of both national and international organ transplant and coordination centers should be increased and all kinds of financial incentives should be provided by the states.
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Availability of data and materials
The datasets used and/or analysed during this study are available from the corresponding author on reasonable request.

Consent for publication
All participants in this study gave full written informed consent for participation and publication.

Disclosure statement
The authors declare that they have no competing interests.

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