

The willingness and attitudes of medical students regarding organ donation and transplantation: a cross-sectional study from Turkey

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SUMMARY

OBJECTIVE: Positive attitudes and motivation on the part of medical students concerning organ donation and transplantation are very important in terms of the growing need for these. This study aimed to evaluate the willingness and attitudes of medical students toward organ donation and transplantation.

METHODS: This cross-sectional study was performed at a state university in Turkey in February–March 2020. The questionnaire investigated sociodemographic characteristics and willingness toward organ donation and transplantation and contained the Organ Donation Attitude Scale.

RESULTS: A total of 309 medical students participated, of which 71.2% were willing to donate their organs. Medical students' willingness to donate organs increased depending on gender, academic year, receipt of education on the subject, discussing donation with family and friends, possession of an organ donation card, knowledge of the organ donation system, and willingness to receive organ donation if necessary. Positive attitudes toward organ donation increased after discussing the subject with family and friends, possessing an organ donation card, and knowing the path to be followed for organ donation.

CONCLUSION: Medical students exhibited high willingness and positive attitudes regarding organ donation and transplantation. However, education on the subject of organ donation and transplantation is needed.

KEYWORDS: Attitude. Students, medical. Organ transplantation. Tissue transplantation. Tissue and organ procurement.

INTRODUCTION

More than 15 million people aged between 30 and 69 years die from noninfectious diseases every year. In total, 85% of these “early” deaths occur in low- and moderate-income countries¹. Changing population demographics and an increasing prevalence of risk factors have contributed to the growing demand for organ replacement therapies. Transplantation is, therefore, the only option for the restoration of organ function and preventing early death for many patients². Transplantation restores not only organ function but also the quality of life. Although there are differences between countries, an estimated 78,627 kidney, 31,044 liver, 7,928 heart, and 5,788 lung transplantations were performed worldwide in 2020³.

Nonmedical obstacles to transplantation include negative attitudes, inadequate role perception, poor motivation, knowledge, expertise, and deficient communication skills at the level of the health worker². Information concerning the benefits and practical aspects of transplantation must therefore be included in the curricula of all health practitioners, from undergraduate

medical students (MS) to postgraduate training for specialists and practicing physicians. The presence of health professionals trained in patient education as part of the treatment team will positively impact the donation process. Positive developments in terms of knowledge and attitudes concerning organ donation (OD) may be a useful strategy for expanding the limited donor pool⁴. Understanding the factors affecting OD and attitudes toward the subject is, therefore, very important in terms of the process involved. The purpose of this study was to evaluate the willingness and attitudes of MS toward OD and transplantation.

METHODS

This cross-sectional survey study was performed between February 14, 2020, and March 10, 2020. A total of 1,569 MS from all academic years were enrolled in the faculty at that time. Assuming an OD willingness level of 50%, a total study sample size of 309 MS was calculated at a 95% confidence interval

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($\alpha=0.05$) and a sample error of $d=0.05$. The layered sampling by years method was employed. The study included people with MS over the age of 18 years. Informed consent was obtained from the MS, and approval for the study was granted by the Ethical Committee. Data were collected with a questionnaire at face-to-face interviews. The questionnaire consisted of two sections. The first section contained questions eliciting sociodemographic information. The second section contained questions concerning the receipt of education concerning OD (yes/no) and the organs the MS would be willing to OD. The Organ Donation Attitude Scale (ODAS) was employed in the second part. The ODAS was developed by Parisi and Katz⁵ and subsequently revised by Kent and Owens⁶. The reliability and validity of the Turkish-language version were established by Yazici Sayin et al.⁷ The ODAS is a 40-item 6-point Likert-type scale. A total of 20 items measure positive attitudes and 20 measure negative attitudes. High positive attitude scores and low negative attitude scores indicate a positive attitude toward OD.

The data were analyzed using the IBM SPSS version 21.00 software and were expressed as number, percentage, and mean \pm standard deviation. The chi-square test was used to compare categorical variables. The normality of distribution was assessed using the Kolmogorov-Smirnov test and graphs. The independent-sample t-test and ANOVA were applied to compare continuous variables. A $p<0.05$ was considered statistically significant.

RESULTS

A total of 309 MS participated in the study. The mean age of MS was 21.6 ± 2.3 years, 59.9% were female, 23.6% were in the first year, and 8.1% had a chronic disease. In total, 46% of MS had received education concerning OD, and 69.9% wished to see education about OD being given every year. In addition, 46.9% reported having discussed OD with their families and 70.6% with their friends. A total of 37.2% of MS understood the path followed for OD in Turkey, while 73.8% reported knowing about the “record system” in Turkey, and 71.2% considered donating organs. In addition, 9.7% of MS had OD cards. Notably, 57.6% of MS reported that organ transplantation from live donors was most frequently performed in Turkey, and 95.8% stated that they would accept ODs if necessary (Table 1). The organs that MS were most willing to donate, in descending order, were blood, kidneys, and liver, while the organs they were least willing to donate were upper airway organs, the extremities, the face, and hairy skin (Figure 1).

MS' willingness regarding OD varied significantly depending on gender ($p=0.034$), their academic year ($p=0.031$), receipt of education on the subject of OD ($p<0.001$), discussion of

OD with the family ($p<0.001$), discussion of OD with friends ($p<0.001$), possession of an OD card ($p=0.001$), knowledge of the OD system in Turkey ($p<0.001$), and their own willingness to accept OD if necessary ($p=0.042$) (Table 1).

ODAS positive attitude subscale scores were higher among women ($p=0.012$), MS who had discussed OD with their families ($p=0.008$), those who were willing to donate organs ($p<0.001$), and those with OD cards ($p=0.022$) (Table 2). ODAS negative attitude subscale scores were higher among men ($p=0.006$), MS with no education concerning OD ($p<0.001$), those who had not discussed OD with their families ($p<0.001$), who had not discussed OD with friends ($p<0.001$), who were unaware of the OD process ($p<0.001$), who were reluctant to donate organs ($p<0.001$), who did not possess OD cards ($p<0.001$), who were unaware of the OD system in Turkey ($p<0.001$), and who stated they would not accept OD if they required it ($p=0.001$). The first-year MS had the highest negative attitude scores, while the lowest scores were observed in the fifth-year MS. Negative attitude scores differed significantly between the academic years ($p<0.001$) (Table 2).

DISCUSSION

A positive attitude toward OD among physicians and MS is an important factor in raising OD rates in society as a whole. The rate in the present study (71.2%) was slightly lower than that in other countries. The reported rates of OD willingness among MS patients range from 80 to 93%^{4,8,9}. OD willingness among MS indicated a positive attitude. A study reported a significant association between positive attitudes toward OD and willingness to donate¹⁰. Deficiencies regarding education have been observed to underlie MS' prejudices toward OD. Misunderstandings and myths on the subject break down as the levels of education rise. A study showed that willingness to donate could be increased through interviews with MS of an educational nature⁸. A study reported an increase in participants' willingness to donate and the disappearance of myths and false beliefs after education¹¹. MS reported feeling a need for education on the subject of OD¹². In the present study, education on the subject of OD was found to increase the willingness to donate. Individuals who had received education on the subject were more willing to donate organs. In addition, most MS stated that they wished to receive such education every year. Including this subject in the curriculum, every year can help keep OD a dynamic topic and encourage and increase willingness to donate.

Consistent with the previous literature, the MS in the present study looked favorably on OD^{12,13}. In terms of the relationship

between gender and OD, studies have reported that women hold more positive attitudes than men^{4,14}. Women also regarded OD more positively than men in the present study. However, another study reported no gender difference regarding attitudes toward OD¹⁵. In contrast to the present research findings, a study from India reported that men exhibited more positive

attitudes than women¹⁶. These differences may be derived from sociocultural variations among the study communities. Increase in positive attitudes to OD was in line with academic years^{4,17}, as MS became more familiar with death and the donation process and were in closer contact with clinical specialties⁴. In one study, the first- and third-year MS had more positive attitudes

Table 1. Characteristics of medical students and their willingness to donate organs.

| Variable | Category | Total 309 (100) | Yes 220 (77.2) | No 89 (22.8) | p-value |
|---|--------------|--------------------|-------------------|-----------------|------------------|
| | | n (%) | n (%) | n (%) | |
| Genderw | Female | 185 (59.9) | 140 (75.7) | 45 (24.3) | 0.034 |
| | Male | 124 (40.1) | 80 (64.5) | 44 (35.5) | |
| Academic year | First | 73 (23.6) | 45 (61.6) | 28 (38.4) | 0.031 |
| | Second | 57 (18.4) | 37 (64.9) | 20 (35.1) | |
| | Third | 45 (14.6) | 30 (66.7) | 15 (33.3) | |
| | Fourth | 46 (14.9) | 34 (73.9) | 12 (26.1) | |
| | Fifth | 44 (14.2) | 38 (86.4) | 6 (13.6) | |
| | Sixth | 44 (14.2) | 36 (81.8) | 8 (18.2) | |
| Chronic disease | Yes | 25 (8.1) | 18 (72.0) | 7 (28.0) | 0.926 |
| | No | 284 (91.9) | 202 (71.1) | 82 (28.9) | |
| Receipt of education concerning organ donation | Yes | 142 (46.0) | 114 (82) | 25 (18) | <0.001 |
| | No | 167 (54.0) | 106 (62.4) | 64 (37.6) | |
| Wishing to receive annual education concerning organ donation | Yes | 216 (69.9) | 156 (72.2) | 60 (27.8) | 0.544 |
| | No | 93 (30.1) | 64 (68.8) | 29 (31.2) | |
| Discussion of organ donation with the family | Yes | 145 (46.9) | 123 (84.8) | 22 (15.2) | <0.001 |
| | No | 164 (53.1) | 97 (59.1) | 67 (40.9) | |
| Discussion of organ donation with friends | Yes | 218 (70.6) | 167 (76.6) | 51 (23.4) | 0.001 |
| | No | 91 (29.4) | 53 (58.2) | 38 (41.8) | |
| Organ transplantation in a relative | Yes | 39 (12.6) | 25 (64.1) | 14 (35.9) | 0.295 |
| | No | 270 (87.4) | 195 (72.2) | 75 (27.8) | |
| A relative on the organ transplantation waiting list | Yes | 19 (6.1) | 14 (73.7) | 5 (26.3) | 0.805 |
| | No | 290 (93.9) | 206 (71.0) | 84 (29.0) | |
| Knowledge of the organ donation process | Yes | 115 (37.2) | 89 (77.4) | 26 (22.6) | 0.064 |
| | No | 194 (62.8) | 131 (67.5) | 63 (32.5) | |
| Possession of an organ donation card | Yes | 30 (9.7) | 29 (96.7) | 1 (3.3) | 0.001 |
| | No | 279 (90.3) | 191 (68.5) | 88 (31.5) | |
| The most common type of organ transplantation in Turkey | Living donor | 178 (57.6) | 131 (73.6) | 47 (26.4) | 0.278 |
| | Cadaveric | 131 (42.4) | 89 (67.9) | 42 (32.1) | |
| Knowledge of the organ donation record system in Turkey | Yes | 228 (73.8) | 175 (76.8) | 53 (23.2) | <0.001 |
| | No | 81 (26.2) | 45 (55.6) | 36 (44.4) | |
| Willingness to receive organ donation if necessary | Yes | 296 (95.8) | 214 (72.3) | 82 (27.7) | 0.042 |
| | No | 13 (4.2) | 6 (46.2) | 7 (53.8) | |

Bold values indicate statistical significance.

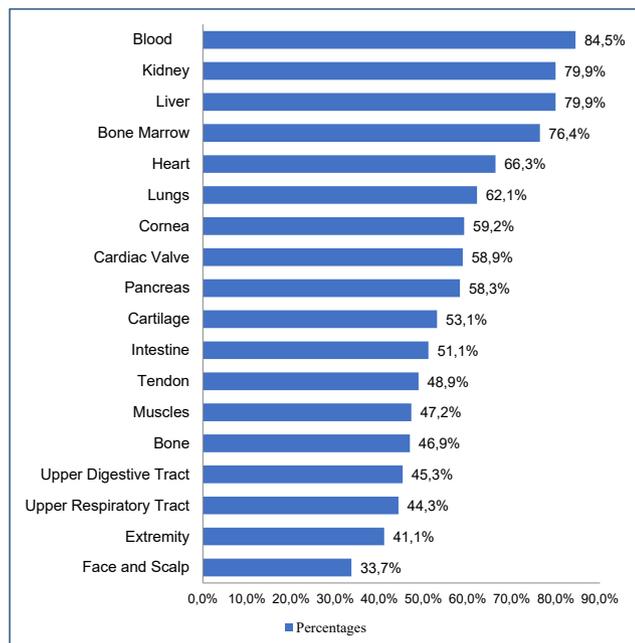


Figure 1. Percentage of organs that medical students were willing to donate.

toward OD¹⁶. However, a study from Pakistan reported no change in attitudes toward OD as education progressed¹⁸. Another study reported that MS' positive attitudes toward OD increased in line with their academic years, while no such changes occurred in nursing or health sciences students¹³. A study from China also reported no association between attitudes toward OD and academic years¹⁵. Although there was no regular increase in positive attitudes by years in the present study, MS' highest negative attitudes toward OD scores were seen in the first year, while the lowest scores were seen in the fifth year. Therefore, it may be concluded that education has a generally positive effect on OD. It will also be helpful for OD and transplantation to be included in the medical curriculum. The findings of this study showed that medical knowledge about OD, the sufficiency of that knowledge, knowing the relevant processes, and discussing the issue with family and friends positively affect attitudes toward OD. However, only 47% of MS had discussed OD with their families. Reported rates of discussion with families are 54–68%^{9,19,20}. Studies reported that individuals who discussed OD with their families exhibited more positive attitudes toward it^{4,15}. A study from Spain also described discussing OD with friends and family as one of the reasons underlying the willingness to donate organs²¹. Finally, a study from Turkey concluded that negative attitudes toward OD on the part of the family adversely affected students' attitudes toward donation²². An environment and family favorably disposed to OD can increase the willingness to donate organs. Observing family approval and willingness may make

it easier for students to make positive decisions on the subject. Therefore, it is very important to explain the issue to all family members by using plans and brochures for all family members in community educational activities. It may be beneficial to plan interactive training sessions with the family from primary school onward for children to raise familial awareness of OD and transplantation.

A study reported that the presence of end-stage renal disease or a friend waiting for a renal transplant did not significantly affect attitudes toward OD¹⁷. Similarly, in the present study, the attitudes of MS acquainted with individuals who had undergone organ transplantation or who were on the waiting list were slightly higher, although the difference was not statistically significant. In another study, being acquainted with a transplantation patient or donor significantly enhanced positive attitudes toward OD among MS⁴. This may be due to low societal awareness of OD. The importance of this subject now needs to be emphasized by means of interventions aimed at raising such awareness. In the present study, 37% of MS reported knowing how OD is performed. A study reported that 34% of participants knew where to register for OD¹¹. The fact that even MS were aware of the path involved in OD suggests that there is a deficiency in society in this area. Education on the subject should be brought down as far as middle and high schools, and it should be explained that OD is a major need for all. However, most MS described themselves as willing to donate organs, and only 1 in 10 possessed OD cards. Another study reported OD card possession rates of 8% among the first-year MS and 10% among the sixth-year MS²³. A study reported that 59% of MS would record their wish to donate organs onto electronic health cards¹³. OD card possession rates have been reported at 21–43%^{9,10,20,24}. Interestingly, a study from China reported that no MS taking part held OD cards¹⁵. Lack of knowledge about OD cards can result in a failure to fully understand the procedure involved in obtaining one and the postponement of action on the subject of OD. Making it easy to get OD cards or record the wish to donate organs onto electronic health cards within the health system will significantly facilitate donation.

In the studies, 92–98% of MS reported that they would accept donated organs if required^{10,25}. Similarly, in the present study, 96% of MS stated they would accept ODs if necessary. There are differences in studies between willingness to receive organs and willingness to donate them^{10,25}. When MS were shown a list of organs capable of being donated, the organs and tissues they were most willing to donate were blood, kidneys, and liver, mentioned in descending order. A study from

Brazil found that the organs they were most willing to donate were the kidneys, liver, and bone marrow¹⁹. In a study from Croatia, the most desirable organs were the kidneys, and the least popular was the skin²⁴. This may be due to their appearing

less frequently in the media. The least popular organs and tissues for donation were the faces and hairy skin, respectively. This may be due to concerns about individuals' external appearance being affected.

Table 2. Comparison of medical students' characteristics and ODAS scores.

| Variable | Category | Positive attitudes | | Negative attitudes | |
|---|--------------|--------------------|------------------|--------------------------|------------------|
| | | Mean±SD | p | Mean±SD | p |
| Gender | Woman | 102.5±13.3 | 0.012 | 43.1±16.5 | 0.006 |
| | Man | 98.3±15.5 | | 50.1±22.1 | |
| Academic year | First | 100.9±14.4 | 0.207 | 53.7±17.2 ^a | <0.001 |
| | Second | 104.1±13.3 | | 45.8±17.6 ^{ac} | |
| | Third | 101.1±15.8 | | 52.8±28.3 ^{ac} | |
| | Fourth | 97.1±15.5 | | 44.4±16.1 ^{abc} | |
| | Fifth | 100.3±13.3 | | 35.3±14.1 ^b | |
| | Sixth | 100.6±13.9 | | 38.1±11.3 ^{bc} | |
| Chronic disease | Yes | 101±13.1 | 0.907 | 45.4±17.8 | 0.968 |
| | No | 100.8±14.5 | | 46±19.4 | |
| Receipt of education concerning organ education | Yes | 102.6±12 | 0.156 | 39.7±17.5 | <0.001 |
| | No | 99.4±16 | | 51±19.2 | |
| Wishing to receive annual education concerning organ donation | Yes | 101.4±14.3 | 0.223 | 45.8±17.8 | 0.648 |
| | No | 99.4±14.6 | | 46.1±22.3 | |
| Discussion of organ donation with the family | Yes | 103.5±12 | 0.008 | 41.9±17.6 | <0.001 |
| | No | 98.5±15.9 | | 49.5±20 | |
| Discussion of organ donation with friends | Yes | 101.1±14 | 0.566 | 43.5±17.8 | <0.001 |
| | No | 100.1±15.3 | | 51.6±21.4 | |
| Organ transplantation in a relative | Yes | 101.9±16 | 0.349 | 45.3±21.8 | 0.413 |
| | No | 100.7±14.2 | | 46±18.9 | |
| A relative on the organ transplantation waiting list | Yes | 105.2±13 | 0.123 | 48.8±18.4 | 0.464 |
| | No | 100.5±14.5 | | 45.7±19.3 | |
| Knowledge of the organ donation process | Yes | 102.5±12.9 | 0.161 | 42±18.4 | 0.002 |
| | No | 99.8±15.1 | | 48.2±19.4 | |
| Willing to donate organs | Yes | 103.4±13.1 | <0.001 | 41.7±18.1 | <0.001 |
| | No | 94.4±15.5 | | 56.3±18.1 | |
| Possession of an organ donation card | Yes | 105.9±12.5 | 0.022 | 35.6±16.1 | <0.001 |
| | No | 100.3±14.5 | | 47±19.2 | |
| The most common type of organ transplantation in Turkey | Living donor | 100.4±14.5 | 0.604 | 45.9±19.7 | 0.989 |
| | Cadaveric | 101.4±14.3 | | 45.9±18.7 | |
| Knowledge of the organ donation record system in Turkey | Yes | 100.8±14.9 | 0.774 | 43.1±19.1 | <0.001 |
| | No | 101±13.1 | | 53.7±17.7 | |
| Willingness to receive organ donation if necessary | Yes | 101±14.6 | 0.126 | 45.1±18.9 | 0.001 |
| | No | 97.3±9.5 | | 63.9±18.3 | |

There is no difference between the same letters in a column. Bold values indicate statistical significance.

There are a number of limitations to this study. First, it is a single-center study, and hence the findings cannot be generalized. Second, since it involved the application of a questionnaire, it may not reflect actual behaviors, which may be lower than the reported willingness rates. Finally, few factors were evaluated in terms of willingness and attitudes toward donation and transplantation; future research should increase these factors.

CONCLUSION

Medical students appear to look favorably on OD. Some had received education on the subject but wished to be given more. We identified a need for greater discussion of the issue with family and friends in the community. Conversation with family and friends was found to have a positive impact on attitudes. Women exhibited more positive attitudes than men. More students reported a willingness to receive donated organs if

necessary than reported a willingness to donate organs. It will be useful to improve societal understanding of OD and encourage and explain the OD system more in detail.

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AUTHORS' CONTRIBUTIONS

SS: Conceptualization, Funding acquisition, Investigation, Project administration, Resources, Validation, Visualization, Writing – original draft. **MKS:** Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review and editing.

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