



Assessment of Knowledge and Attitudes Toward Organ Donation Among School Teachers: First National Survey Study

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ABSTRACT

Background and aim. The most important factors affecting organ donation are socioeconomic, educational, and cultural factors. The aim of this study was to evaluate the attitudes, knowledge levels, and behaviors of school teachers toward organ donation

Methods. This study surveyed 2400 school teachers working in official public schools. Turkey was divided into 26 regions based on the similarity of social, economic, and geographic factors identified by the Turkish Statistical Institute. Teachers were distributed equally in the city center and towns based on population. The survey procedures were carried out using computer-assisted personal interviewing.

Results. Among teachers, 89.6% had a bachelor's degree and 8.5% had a master's degree. In addition, 32.5% worked in primary schools, 33.1% worked in secondary schools, and 34.4% worked in high schools. Furthermore, 0.7% had donated an organ; 66.5% were not considering organ donation in the future, of whom 9.0% indicated religion as the reason for not donating an organ, and 34.8% did not indicate any reason. In addition, 96.6% considered organ donation to be proper behavior for humanity and 68% believed that organ donation is appropriate in religious terms.

Conclusions. This study showed that school teachers have inadequate knowledge and attitudes toward organ donation. Encouraging children and adolescents to make a well-informed decision about organ donation and to register this choice will depend largely on preparing school teachers with adequate knowledge and motivation toward creating generations with a positive attitude toward organ donation.

THE global organ shortage is the strongest factor for long wait times and increased deaths on wait lists. One of the major reasons for this organ shortage in Turkey, as well as worldwide, is insufficient public awareness about organ donation in addition to attitudes among general public and health care professionals toward organ donation. Attitudes toward organ donation in the general public can be influenced by several factors, such as the level of related knowledge, level of education, and religion. Informing youth can play a key role in guiding the knowledge, attitudes, and behavior of the general public [1,2]. High school students are key actors in the organ donation process. In many countries, including Turkey, a citizen can indicate his or her willingness to donate an organ on his or her driving license. Accordingly, people may make their first

decisions regarding organ donation as teenagers, when they obtain their driving licenses. This decision can be difficult for individuals who have poor knowledge and are not informed about organ donation. Research indicates that knowledge about organ procurement is positively correlated with signing an organ donor card [3].

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Hence, it is important to provide good information at the youngest age possible. These individuals can further influence their families and community in all aspects of organ donation and transplantation. School teachers have a strong influence on public opinion. Furthermore, they are one of the major sources of information to youth in society. Teachers serve as the natural raters of students within the school and classroom contexts [4] and hence can play a major role in promoting public knowledge and attitudes toward organ donation.

Establishing educational programs in schools to promote organ donation knowledge and attitudes will largely depend on school teachers as the key player in youth education. However, school teachers are not necessarily up to date on the empirical medical and scientific facts relevant to organ donation. Little is known about school teachers' knowledge levels and attitudes toward organ donation in Turkey. The present study aimed to determine the attitudes, knowledge levels, and behaviors of school teachers with regard to organ donation in Turkey. Such information will help us understand whether school teachers are ready to be involved in promoting organ donation knowledge and attitudes through educational programs in schools and determine the need for special training programs or courses to prepare them for this task.

MATERIAL AND METHODS

The primary aim of this study was to evaluate the attitudes, knowledge, and behaviors of school teachers with regard to organ donation through a national survey study. Teachers are role models for students and therefore have an important role in shaping the future of society. To achieve this goal, teachers working in official schools (primary, secondary, high school) affiliated with the Ministry of National Education around Turkey were identified as the universe of the study. To calculate the suitable sample size that represents the teachers' universe, the necessary information was entered into www.surveysystem.com/sscalc.htm and the number of minimum subjects was calculated as 2393 (confidence level: 95%, confidence interval: 2.0, population: ~700.000). However, to correct for any lost data during loading into the system, the subject number was revised to 2400. The study was supported and funded by Inonu University Scientific Research Projects Coordination Unit (project no.: 2018/982). Ethics approval was obtained from the Inonu University institutional review board for noninterventional studies (2018/1-8).

This study used and modified the Nomenclature of Territorial Units for Statistics, which was developed by the Statistical Office of the European Union, in surveying Islamic religious officials throughout Turkey. To sum up, Turkey was divided into 26 regions based on regional similarities in terms of social, economic, and geographic factors identified by the Turkish Statistical Institute using the Nomenclature of Territorial Units for Statistics-II system. Two thousand four hundred teachers were distributed based on city populations. The number of teachers in each city and town in each of the 26 regions was proportionate to the population. The national survey was conducted by PRP Research and Consultancy Company, located in Istanbul, Turkey. A survey protocol was laid out with the company. The preparation of the survey, including the selection of pollsters and reporting of results, was conducted following ISO 9001/ISO 20252 and Esomar (<http://www.praparastirma.com>). A stratified sampling method that includes age and sex was used for this survey study. Face-to-face interviews were conducted outside the

school borders. The survey was conducted using computer-assisted personal interviewing.

Statistical Analysis

The statistical analysis was performed using a licensed version of IBM SPSS Statistics 25.0 (Statistical Package for the Social Sciences, Inc., Chicago, Ill, United States). The categorical variables were presented as both a number and percentage (%). The chi-square test was used to compare categorical variables in groups created according to education levels.

RESULTS

Demographic and Sociocultural Characteristics

A total of 2400 teachers working in official schools were included in this survey study; 1047 were male (43.6%) and 1353 were female (56.4%). Among the included teachers, 86.8% were younger than 45 years of age, 69.6% were less than 174 cm in height, and 55.8% weighed less than 75 kg. A total of 1785 teachers were married, and 70 were divorced due to various sociocultural factors. The divorce rate among teachers was 3.92%. In addition, 1141 of the married teachers had children (63.9%; min-max: 1-5 children); the remaining 644 teachers did not have children (36.1%). Among the study teachers, 1.7% had an associate degree (n = 40), 89.6% had bachelor's degree (n = 2151), 8.5% had master's degree (n = 203), and the remaining 0.3% had a doctoral degree (n = 6). Furthermore, 32.5% of the teachers worked in primary schools (n = 780), 33.1% worked in secondary schools (n = 794), and the remaining 34.4% worked in high schools (n = 826). The prevalence of smoking among teachers was 30.5% and the number of cigarettes smoked per day ranged from 1 to 30. The prevalence of alcohol use among teachers was 25.6% but the amount and frequency of alcohol drinking varied (Table 1).

Characteristics Related to Organ Donation Awareness

Of the 2400 teachers included in this survey, 0.7% stated that they had donated an organ (n = 16), 66.5% stated that they were not considering donating an organ in the future (n = 1585), and 25.0% were undecided/no idea about organ donation (n = 596). Among the study population, 34.8% of the teachers gave no specific reason for their decision not to donate (n = 922); 23.3% stated that they had not considered organ donation or thought about it (n = 617), and 9.0% (n = 238) stated that they would not consider organ donation due to religious beliefs.

Only 23.6% of the teachers stated that they had sufficient information about organ donation (n = 567). Among the study population, 34.3% stated that they need more information about organ donation (n = 823) and 32.1% rejected any further information about organ donation (n = 770). Among the teachers, 20.5% stated that their main source of information about organ donation and transplantation is television (n = 1203), 22.5% stated that they got their information from the Internet (n = 1319), 13.1% from health care professionals (n = 769), and 15.2% from in-service training symposia (n = 890). Among the

Table 1. Demographic and Sociocultural Features of 2400 School teachers

Demographic Features	n	%
Sex		
Male	1047	43.6
Female	1353	56.4
Age group (years)		
≤34	988	41.1
35-44	1097	45.7
45-54	229	9.5
≥55	86	3.6
Height (cm)		
≤167	1070	44.6
168-173	599	25.0
174-179	419	17.5
≥180	312	13.0
Weight (kg)		
≤68	848	35.3
69-74	493	20.5
75-80	574	23.9
81-86	272	11.3
≥87	213	8.8
Marital status		
Married	1715	71.5
Unmarried	615	25.6
Divorced	70	2.9
Has children		
Yes	1141	63.9
No	644	36.1
Education levels		
Associate's degree	40	1.7
Bachelor's degree	2151	89.6
Master's degree	203	8.5
Doctoral degree	6	0.3
Type of school		
Primary school	780	32.5
Secondary school	794	33.1
High school	826	34.4
Smoker		
Yes	731	30.5
No	1669	69.5
Alcohol use		
Yes	193	8.0
Rarely	423	17.6
No	1784	74.3

included teachers, 0.6% stated that a family member had donated an organ (n = 15). In total, 41.0% of the teachers thought that living organ donation is the best source for organ transplantation, and 39.2% thought that cadaveric organ donation was the best option (Table 2).

Among the teachers, 94.9% stated that they would donate an organ if a close relative needed a transplant (n = 2278). In total 97.3% of the teachers stated that they would consent to organ donation if they suffered an end-organ failure (n = 2335). In total, 96.6% of the teachers stated that organ donation was suitable and necessary behavior for mankind. Among the teachers, 68.0% stated that organ donation was suitable for Islam

(n = 1633) but 11.9% stated that it is not suitable (n = 285). In total, 67.9% of the teachers stated that they were not faced with questions regarding organ donation from students.

The teachers were grouped into 3 categories according to their education level: associate degree (n = 40), bachelor's degree (n = 2151), and master's/doctoral degree (n = 209). Statistically significant differences were found between groups in terms of sex ($P = .028$) and organ donation status ($P < .001$). There was a female predominance among associate degree and bachelor's degree groups and a male predominance among master's/doctoral degree groups. All groups differed in terms of organ donation. Teachers with master's/doctoral degrees gave a higher positive opinion to the question on the suitability of organ donation (73.7%) in terms of religion. However, this difference did not reach the level of statistical significance ($P = .185$ Table 3).

DISCUSSION

Organ transplantation is one of the most remarkable and dramatic therapeutic advances in medicine. However, each year, the number of people on the waiting list continues to be much larger than both the number of donors and transplants, which grow slowly. There is an overwhelming disparity between the need for solid organ transplantation and the shortage of donor organs, and the number of organ donations is insufficient worldwide. According to the records of the Turkish Ministry of Health, in 2015, 935 patients per million populations had kidney failure and only 17.4% were transplanted, while 77.3% of them were on hemodialysis treatment [5]. Due to the limited supply of livers, there are still thousands of candidates waiting for liver transplantation in Turkey, and less than 30% received an organ in 2017 [6]. The organ donation rate in Turkey is lower than that in Western countries. According to a recent study, deceased donation rates per million people are as follows: Spain, 43.6; Portugal, 32.6; Belgium, 30.7; France, 28.6; Iceland, 26.9; Finland, 24.6; United Kingdom, 21.2; S. Korea, 11.4; Turkey, 7.0 [7]. The most important reasons for this are insufficient knowledge, inadequate awareness, and false beliefs.

Many patients die while on the waiting list because of long waiting times, and many of them become too sick for transplant to be performed and get dropped from the list. This further highlights the importance of continuous promotion of organ donation to avoid mortality on the waiting list. It is estimated that up to 100 patients per million population present with brain death every year because of accidents and intra-axial hemorrhage, representing a high number of potential organ donors. However, the rate of potential donors in countries that perform transplantations with deceased donor organs varied from 6 to 47 per million population yearly. Accordingly, the rate of effective donors varied from 1 to 20 per million population, and in some countries deceased donor organs are not used. The family refusal rate for organ donation varied from 28% in Uruguay to 70% in Peru [8]. Studies from the United States and Europe evidenced that the main obstacle to organ donation is the high level of families that do not consent to donation [9–11].

Table 2. Organ Donation Information of 2400 School teachers

	n	%	
Have you donated an organ?			
Yes	16	0.7	
No	2384	99.3	
Do you planning to donate an organ in the future? (n=2384)			
Yes	203	8.5	
No	1585	66.5	
Undecided/ no idea	596	25	
Do you know how to proceed when you want to donate an organ?			
Yes	1333	55.5	
No	599	25.0	
Partially	468	19.5	
Why would you not donate an organ? (One or more options) (A total of 2648 answers were evaluated)			
My family and friends do not have a positive attitude toward organ donation	99	3.7	
I don't want my body integrity deteriorated after death	222	8.4	
I have many health problems	85	3.2	
Religious beliefs	238	9.0	
I do not trust health institutions	215	8.1	
I worry that my organ would pass into the hands of the organ mafia	22	0.8	
News in media (social, Internet, verbal, written)	32	1.2	
I have many fears	161	6.1	
I have never considered organ donation	617	23.3	
I do not have enough knowledge about organ donation	35	1.3	
I have no specific reason	922	34.8	
Where did you get information on organ donation? (One or more options)			
Television programs	1203	20.5	
Daily newspaper	525	9.0	
Internet	1319	22.5	
Radio broadcasts	16	0.3	
Books/magazines	289	4.9	
Health care professionals	769	13.1	
Social media (Facebook, Instagram, WhatsApp, Twitter, etc)	581	9.9	
Family/relatives/friends	241	4.1	
During education	890	15.2	
No idea	11	0.2	
Other	13	0.2	
Would you like to get more information about organ donation?			
Yes	823	34.3	
No	770	32.1	
No need/enough idea	567	23.6	
Don't know/no idea	240	10.0	
Which is the most ideal type of organ transplantation?			
Living donor (family member, relatives, nonrelated, etc)	984	41.0	
Deceased donor	941	39.2	
Don't know/no idea	475	19.8	
	Yes (%)	No (%)	Don't Know/ No Idea (%)
Has anyone in your family donated an organ?	15 (0.6)	2259 (94.1)	126 (5.3)
Are you willing to donate an organ to a close relatives if necessary?	2278 (94.9)	20 (0.8)	102 (4.3)
Would you accept organ transplant if necessary for your health?	2335 (97.3)	26 (1.1)	39 (1.6)
Do you believe organ donation is a necessary and appropriate behavior for humanity?	2319 (96.6)	22 (0.9)	59 (2.5)
Is organ donation appropriate in religious terms?	1633 (68.0)	285 (11.9)	482 (20.1)
Does your school organize routine meetings or conferences on organ donation?	167 (7.0)	1629 (67.9)	604 (25.2)
Are you exposed to your students' questions about organ donation?	362 (15.1)	1658 (69.1)	380 (15.8)

Table 3. Comparison of the Viewpoints of School teachers on Organ Donation by Education Level

	Associate (n = 40)	Bachelor's (n = 2151)	Master's, Doctorate (n = 209)	P
Sex				0.028
Male	13 (32.5)	927 (43.1)	107 (51.2)	
Female	27 (67.5)	1224 (56.9)	102 (48.8)	
Have you donated an organ?				<0.001
Yes	0 (0)	10 (0.5)	6 (2.9)	
No	40 (100)	2141 (99.5)	203 (97.1)	
Do you plan to donate an organ in the future?				0.259
Yes	4 (10)	183 (8.5)	22 (10.5)	
No	31 (77.5)	1419 (66.0)	140 (67.0)	
Undecided	3 (7.5)	236 (11.0)	26 (12.4)	
Don't know/no idea	2 (5.0)	313 (14.6)	21 (10.0)	
Are you willing to donate an organ to a close relatives if necessary?				0.300
Yes	35 (87.5)	2044 (95.0)	199 (95.2)	
No	1 (2.5)	17 (0.8)	2 (1.0)	
Don't know/no idea	4 (10.0)	90 (4.2)	8 (3.8)	
Is organ donation appropriate in religious terms?				0.185
Yes	23 (57.5)	1456 (67.7)	154 (73.7)	
No	8 (20.0)	257 (11.9)	20 (9.6)	
Don't know/no idea	9 (22.5)	438 (20.4)	35 (16.7)	
Would you accept an organ transplant if necessary for your health?				0.111
Yes	37 (92.5)	2095 (97.4)	203 (97.1)	
No	2 (5.0)	23 (1.1)	1 (0.5)	
Don't know/no idea	1 (2.5)	33 (1.5)	5 (2.4)	
Are you exposed to your students' questions about organ donation?				0.738
Yes	6 (15.0)	325 (15.1)	31 (14.8)	
No	29 (72.5)	1478 (68.7)	151 (72.2)	
Rarely	5 (12.5)	348 (16.2)	27 (12.9)	

A study from Palestine showed that religious beliefs and fear of complications were the main factors influencing organ donation [12]. These fears arise from inadequate information about the donation process and the religious stand concerning donation; studies showed that faith leaders are united in their support for organ donation and, in general, no faith or belief groups are against organ donation in principle [13,14]. A study from Germany also showed that willingness to potentially act as an organ donor was related to the preexisting knowledge, trust, and fear [15].

There is a clear need for every individual in a society to be well informed about organ donation and transplantation to contribute to efforts to increase low donation rates. Educational campaigns are a great tool being used by all countries and the medical communities to promote a positive perception of organ donation [16]. These campaigns include using the television industry, raising money for travel expenses, and education seminars. This article looks at the different groups and programs aimed at increasing organ donation. One of the many efforts to increase the number of registrations in the Netherlands is a yearly initiative to encourage 18-year-olds to register their choice (irrespective of whether they want to be a donor). After adolescents turn 18, they receive a letter from the Ministry of Health, Welfare, and Sport asking them to register their choice. This led to a response rate of 33.0% in 2016, of whom 73.9% permitted organ donation [17].

It is important to provide good information at the youngest age possible. These individuals can influence their families in all aspects of organ donation and transplantation. Furthermore, youth will eventually have their own families, and their education will inform the next generation. Educational programs that focus specifically on high school students are needed because the current sources of donation-related information for this group are inadequate.

In Turkey, about 22% of the population is students. Therefore, it is obvious that teachers, who are role models for students, will have an important role in organ donation awareness in the future. The effectiveness and implementation of a program aiming to encourage less-educated adolescents to make a well-informed decision about organ donation and to register this choice will depend on preparing school teachers with adequate knowledge and motivation toward creating generations with positive attitudes concerning organ donation. A teacher in a community represents a major node of the total human social system where culture is transmitted and observed.

A review by Li et al [18] examined the effectiveness of school-based educational programs on deceased organ donation among adolescents. The outcomes were knowledge, attitudes, intent to register a preference toward deceased organ donation, and whether such education fostered family discussions about organ donation. The study found that educational programs achieved success in promoting family discussions and increased

knowledge and attitudes, with variable effects on intent to affirmative registration. The review concluded that adolescent classroom education is a promising strategy to improve knowledge about deceased organ donation and appears to increase public support for donation [18].

A study on the effect of training programs on the knowledge and attitude of high school students toward organ donation and transplantation in Turkey showed clearly that such educational programs greatly enhanced the students' level of knowledge related to many aspects of organ donation and transplantation and significantly expanded awareness. The study concluded that, by leading to changes in opinion, such training programs will significantly increase the number of donors and the rate of transplantation in Turkey [3].

School-based health education was also found to be a promising approach for improving organ donation rates among ethnically diverse youth. The impact of a classroom intervention was examined in a multicultural high school population (African American, 45%; Asian American, 30%; White, 33%). In an educational session, students in the intervention group demonstrated a significant increase in knowledge scores, as well as a positive movement of opinion regarding willingness to donate. The positive changes in opinion occurred independent of ethnicity and sex, despite these both being negative predictors of opinion at baseline. These results demonstrated that even a single classroom exposure can impact knowledge levels, correct misinformation, and affect attitude changes regarding organ donation among an ethnically diverse adolescent population [19].

Evaluation of any such health education program largely depends on school teachers as the key player in youth education. Students tend to accept that teachers are honest and transparent and that their positions and opinions are reflective of the moral values in society. The information and knowledge that all school staff can provide to school students are fundamental to students developing a favorable attitude to this matter in the future [20]. Teachers have favorable attitudes toward living-related kidney or liver donation. Their students would thus receive positive feedback when they request relevant information [21].

This study showed that school teachers are skeptical toward organ donation. Most think that organ donation is necessary for mankind (96.6%) and the majority would consent to an organ transplant if they suffered an end-organ failure (97.3%). Yet, unless the organ is for a close relative, most would not consider donating an organ in the future (66.5%) or were undecided (25.0%). Most of those who declined organ donation gave no specific reason for their decision and some declined because of religious beliefs. These data further expose the inadequate attitudes among school teachers about organ donation. Furthermore, in this study, though only 23.6% of the teachers thought they had sufficient information about organ donation, a large percentage (32.1%) stated that they did not want any information about organ donation. This reveals the inadequate knowledge and inadequate interest in the subject. School teachers with higher education (holding a master's or doctoral

degree) had more positive opinions with regard to the question of the suitability of organ donation, indicating the influence of education level on attitudes.

Little research has been done on the knowledge and opinion of school teachers with regard to organ donation and transplantation. A recent study from Turkey examined the new generation of teachers [22]. This study examined the knowledge, practices, and behaviors of pre-service science teachers regarding organ donation and transplantation. Though 92.8% of participants supported organ donation regardless of their year of study, only 1.1% declared that they were registered to be a donor. Pre-service science teachers in this study showed a generally low level of knowledge regardless of their year of study and sex. A study from Spain showed that 75% of secondary school teachers are in favor of organ donation, 23% had doubts, and 2% were not in favor. Regarding the knowledge of brain death, 62% accepted that this meant a person's death. This study also showed that it is necessary to carry out teacher training courses about organ donation and transplantation to provide adequate information to allow them to cope with the information demand by pupils [23]. Teachers reported receiving information about organ donation and transplantation from several sources, the most frequent being audiovisual means: television (89%), press (60%), and radio (47%). Social/family means were also important, such as conversations with other people (51%) and conversations with family members (39%). However, fewer than half think that the information is good. Teachers who reported having good information were more in favor of organ donation and transplantation than those who had limited or no information [24]. A study from The Netherlands [25] on education regarding organ donation and transplantation in primary school to gather information on teachers' perspectives about a neutral lesson devoted to organ and tissue donation found sufficient support for a lesson on donation and transplantation, and the majority of the children appreciated this type of lesson. These findings support the idea of developing a curriculum on organ donation that begins in the highest grades of primary school and continues into middle/junior and high school. The authors are convinced that this curriculum would contribute to health literacy on this topic and provide children and their families with appropriate information to make proper decisions about donation [25].

To sum up, this study showed that school teachers in Turkey have inadequate knowledge and attitudes toward organ donation, highlighting the need to educate school teachers if educational programs to promote organ donation in the youth are to be used as an effective tool to induce a community attitude toward a surge in organ donation.

SUPPLEMENTARY MATERIALS

Supplementary material associated with this article can be found in the online version at [doi:10.1016/j.transproceed.2021.11.029](https://doi.org/10.1016/j.transproceed.2021.11.029).

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