

# Knowledge levels, attitudes, and awareness of nurses toward organ donation

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## ABSTRACT

**OBJECTIVE:** The aim of this study was to assess the knowledge, attitudes, and practices of nurses in Turkiye concerning organ donation.

**METHODS:** This survey-based, descriptive cross-sectional study was conducted from January 2020 to March 2020, recruiting 560 of 850 nurses currently working in a tertiary university hospital with a face-to-face interview technique. The questionnaire consisted of 35 questions evaluating sociodemographic features, organ donation knowledge level, attitude, and nurses' awareness.

**RESULTS:** This study showed that only 6.5% of the nurses donated their organs. While 31.9% stated that they are willing to consider organ donation in the future, 41.3% were not decided about organ donation yet, and 27% rejected organ donation in any condition. Among the nurses who refused organ donation, 69.6% had no specific reason and 10.6% worried that their organs might be taken without proper diagnosis of brain death. About 10% denied organ donation for religious beliefs, and 5% were because of concerns about body integrity. Hesitation about procuring organs for commercial purposes was present in 7.2% of the nurses. Following a possible diagnosis of brain death of a relative, 33.8% of the nurses said that they would consent for organ donation to him/her, whereas 47.1% were not sure about this issue. Among the nurses, 76.6% agreed on a possible living-related organ donor for a close relative, 53.3% accepted receiving an organ from a close relative if required. Furthermore, this investigation showed that nurses who reported attending previous seminars, conferences, or training programs about organ donation have significantly better donation rates and stronger attitudes toward organ donation. Nurses who donated their organs are found to know better about brain death irreversibility, understand better the related national legal regulations for organ donation, and are more informed about the compatibility of organ donation with religious beliefs.

**CONCLUSION:** This study showed that nurses have a relatively positive attitude toward donation and transplantation but are unwilling to bequeath their organs. This study underlines the indispensable contribution of nurses promoting organ donation and highlights the need for well-structured educational programs to enhance their role in organ donation and transplantation.

*Keywords: Attitudes; awareness; barriers to the organ donation; knowledge levels; nurses; organ donation.*

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The survival and life quality of patients undergoing organ transplantation have improved in recent years, due to medical and technical developments. However, organ shortage remains to be a demanding problem. The organ donation rate in Türkiye is relatively lower when compared with Western countries, and the gap between the number of patients on the waiting list for an organ donation and that of donors and available organs for transplantation constantly increase [1–3].

Studies with a final goal to promote cadaveric organ donation and aim to understand the factors that impact people's decision on organ donation have shown that educational, socioeconomic, cultural, and religious factors, as well as knowledge of and attitudes toward organ donation all, contribute to the decision to donate organs in life and after death [1, 4–6]. Nurses are key actors in the organ donation process, and their opinion may affect people's decisions on organ donation. Furthermore, nurses can help in the educational programs required to promote public organ donation knowledge and attitude. This study aims to reveal nurses' attitudes, knowledge levels, and behaviors in Türkiye about organ donation. These data are essential to optimize the utilization of nurses in the different phases of the organ donation and transplantation process and to examine whether nurses in this country are ready to promote organ donation knowledge and attitude through educational programs.

## MATERIALS AND METHODS

### Study Design

This survey-based descriptive cross-sectional study was conducted to evaluate the knowledge, attitudes, and behaviors of nurses in a tertiary university hospital concerning organ donation. This research comprised a representative sample of nurses of both sexes working in Inonu University Faculty of Medicine Turgut Ozal Medical Center, a tertiary university hospital in Türkiye. Out of 850 nurses working in this center, the sample size was calculated using a Creative Research Systems survey software on the <https://www.surveysystem.com/sscalc.htm> web page. The data required for the calculation were recorded manually in the assigned sections, using confidence level 95%, confidence interval 2.5, and population of 850. The required sample size was calculated to be 549. In the study period from January 2020 to March 2020, a total number of 560 nurses were interviewed face-to-face for this study, out of which 556 of them (65.4% of the nurses working at this center) were included in the

### Highlight key points

- Organ donation has still not reached a sufficient rate among nurses. The most prominent underlying fact seems to be limited knowledge and awareness.
- Nurses, constituting an important part of health care, are key actors in the organ donation process, and their opinion may interfere community's decisions about organ donation.
- Well-structured in-service training programs are needed to enhance nurses' role in organ donation.

study as the agreed and filled the survey form ultimately. Initially, the required official administrative permissions from the Directorate of the Turgut Ozal Medical Center were granted (Approval date: December 19, 2019 and Number: 770). Afterward, ethical approval was obtained from the Inonu University Institutional Review Board for non-interventional studies (Approval date: January 7, 2020 and Number: 227). The study was carried out in accordance with the Helsinki Declaration "Ethical Principles for Medical Research Involving Human Subjects." Each participant gave verbal consent before the questionnaire was distributed. A questionnaire (Tables 1–3) with 35 questions was designed to evaluate the attending nurses' knowledge level, attitude, and awareness for organ donation in addition to sociodemographic characteristics of the participants. Data were collected in the work environment in a face-to-face interview setting.

### Statistical Analysis

The statistical analyses were performed using IBM SPSS Statistics v25.0 (Statistical Package for the Social Sciences, Inc., Chicago, IL, USA). The quantitative variables were expressed as median and interquartile range (IQR). The qualitative variables were reported as number and percent (%). Kolmogorov-Smirnov test was used to assess the normality of quantitative variables' distribution. A non-parametric Mann-Whitney U-test was used to compare quantitative variables. Pearson's Chi-square test was used to compare qualitative variables.  $P \leq 0.05$  was considered a statistically significant value.

## RESULTS

### Demographic and Sociocultural Characteristics

This study included a total number of 556 nurses, among which 400 (71.9%) were female, 156 (28.1%) were male with an age range from 20 to 59 years (median: 33; IQR: 10). The median age for males was 30 years (IQR: 7) and

**TABLE 1.** Demographic and sociocultural features of 556 nurses

	No	%
Age (years) (median [IQR])	33 (10)	
BMI (median [IQR])	24.6 (4.6)	
Gender		
Male	156	28.1
Female	400	71.9
Educational level		
Health vocational high school	18	3.2
Associate's degree	12	2.2
Bachelor's degree	487	87.6
Master's degree	37	6.7
Doctorate degree	2	0.4
Which unit do you work in the hospital?		
Service	276	49.6
Intensive care unit	211	38.0
Outpatient clinic	39	7.0
Operating room	30	5.4
Are you on night shift in the hospital?		
Yes	415	74.6
No	141	25.4
Marital status		
Married	351	63.1
Unmarried	188	33.8
Divorced	17	3.1
Do you have children?		
Yes	310	55.8
No	246	44.2
Number of child (median [IQR])	2 (1)	
Socioeconomic status (monthly income/Turkish liras)		
Low (<3000)	60	10.8
Moderate (3000–5000)	324	58.3
High (>5000)	172	30.9
Do you have any chronic disease?		
Yes	135	24.3
No	421	75.7
Do you constantly use any medicine for chronic disease?		
Yes	108	19.4
No	448	80.6
Smoking		
Yes	186	33.5
No	370	66.5
Alcohol use		
Yes	36	6.5
No	520	93.5
How many years have you been a nurse? (median [IQR])	10 (10)	
How many hours do you work per week? (median [IQR])	40 (0)	

IQR: Interquartile range; BMI: Body mass index.

for women was 34 years (IQR: 12), ( $p < 0.001$ ). Median BMI for male was 25.6 kg/m<sup>2</sup> (IQR: 4) and for women was 24 kg/m<sup>2</sup> (IQR: 5), ( $p < 0.001$ ). Education degree was rated as an undergraduate level for 87.6% and graduate level for 7.1% of the nurses. The majority of the nurses worked in the service (49.6%) and intensive care unit (38%). Among the nurses, the working schedule was set as only daytime shifts for 25%, and the remaining worked in daytime and night shifts. About 63.1% of the participants were married and 55.8% had children. Socioeconomic status was declared medium for 58.3% and high for 30.9% of the nurses. In terms of medical history, 24.3% of the nurses had at least one chronic disease, of which 19% were constantly prescribed medication for their disease. Among the nurses, 33.5% were actual smokers with a median of 8 (IQR: 13) cigarettes per day and 6.5% had a positive history of regular alcohol consumption. Nurses stated to be actively working as nurses with a median of 10 years (IQR: 10). Demographic and sociocultural features of the nurses are shown in Table 1.

### Characteristics Related to Organ Donation Awareness

Concerning previous donation experience, 44.1% of the included nurses stated a 1 time blood donation. Concerning the organ donation rate, only 6.5% donated their organs. Among the nurses who did not donate their organs, only 31.9% stated that they are willing to consider organ donation in the future, 27% rejected organ donation in any condition. The remaining 41.3% were not decided about organ donation yet. Among the nurses who refused organ donation, 69.6% had no specific reason and 10.6% worried that their organs might be taken without proper diagnosis of brain death. About 10% denied organ donation for religious beliefs and 5% were because of concerns about body integrity. Hesitation for procuring organs for commercial purposes was present in 7.2% of the nurses.

On the other hand, remaining nurses who donated their organs stated that their motives were saving lives (80.5%), an act of social responsibility that is expected from every individual (66.7%), and the possible need of a relative for organ transplantation in the future (33.3%). According to the survey, the opinions of religious leaders and conviction leaders about organ donation do not influence 48.4% of the nurses, whereas it only partially influences 36.7% of the nurses. Almost half of the nurses knew presence of national legal regulations for organ donation, while 39.7% of the nurses did not hear about this issue. More than half of the nurses stated that they

**TABLE 2.** Summary of data on organ donation awareness of nurses

	No	%
Have you ever donated blood?		
Yes	245	44.1
No	311	55.9
Have you donated your organs?		
Yes	36	6.5
No	520	93.5
Are you willing to donate your organs in future?		
Yes	166	31.9
No	139	26.7
I am undecided	215	41.3
What are your reasons to refuse organ donation?		
Religious beliefs	53	9.5
Body integrity can deteriorated after death	28	5.0
Distrust against health institutions	8	1.4
My organs might use for commercial purposes	40	7.2
My organs can be harvested before brain death	59	10.6
No specific reason	387	69.6
What are the most important reasons for you to donate organs?		
To save other people's lives	29	80.5
My relatives may need an organ transplant 1 day	12	33.3
Organ donation is a social responsibility that everyone should do	24	66.7
Having my organs live in someone else after I passed away	8	22.2
Awareness programs on social media organs	0	0
Because it is in line with my religious beliefs and worldviews	6	16.7
Have you attended seminars, conferences, or training programs about organ donation?		
Yes	239	43.0
No	266	47.8
I'm not sure	51	9.2
Do religion or opinion leaders' views affect your decision to donate organs?		
Yes	83	14.9
Partially	204	36.7
No	269	48.4
Do you think there is a legal regulation in our country regarding organ donation?		
Yes	276	49.6
No	59	10.6
No idea	221	39.7
Do you think the Presidency of Religious Affairs has a fatwa on organ donation?		
Yes	194	34.9
No	49	8.8
No idea	313	56.3
Do you think organ donation is appropriate in terms of religious rules/beliefs?		
Yes	303	54.5
No	53	9.5
No idea	200	36.0

**TABLE 2 (CONT.).** Summary of data on organ donation awareness of nurses

	n	%
Which is the most ideal type of organ transplantation?		
Living donor	208	37.4
Deceased donor	232	41.7
No idea	116	20.9
Do you know where to apply for organ donation?		
Yes	294	52.9
No	262	47.1
Do you believe that a patient with brain death might come back to life?		
Yes	88	15.8
No	373	67.1
No idea	95	17.1
Do you have a relative waiting for an organ transplantation?		
Yes (kidney=23, liver=9, and heart=4)	36	6.5
No	520	93.5
Did any of your relatives underwent organ transplantation?		
Yes (living donor transplantation)	102	18.3
Yes (deceased donor transplantation)	22	4.0
Hayır	432	77.7
Would you donate the organs of your relative who had brain death?		
Yes	188	33.8
No	106	19.1
I'm not sure	262	47.1
Do you willing to donate your organs to a close relatives when it is necessary?		
Yes	426	76.6
No	33	5.9
I'm not sure	97	17.4
Would you accept one of your relatives to be a living donor candidate for you if it is necessary?		
Yes	291	52.3
No	66	11.9
I'm not sure	199	35.8
Which of the following factors can increase the number of organ donations?		
Providing financial support to organ donors by the state	256	46.0
Providing some social opportunities to organ donors	302	54.3
Organizing campaigns in public institutions related to organ donation	323	58.1
Giving a sermon about organ donation in mosques and foundations	317	57.0
Organizing educational seminars in schools in annual periods	285	51.2
Reduction of prison sentences for some prisoners who donate organs	109	19.6
Granting citizenship to relatives of foreign nationals who donate organs	48	8.6

were not informed about the religion statement of the Religious Affairs Association about organ donation. More than half of the nurses said that organ donation is compatible with Islamic rules, whereas 36% did not have any idea about this issue. Nearly half of the nurses did

not know where to apply for organ donation. The nursing subgroup of 15.8% stated that brain death is reversible, whereas another subgroup of 17.1% is not sure about this issue. Among the nurses, 6.5% said that a relative was placed on the organ waiting list and 22.3% stated that

**TABLE 3.** Comparison of nurses who donated and those who did not donated

	Donated (n=36)	Not donated (n=520)	p
How many years have you been a nurse? (median [IQR])	11 (12)	9 (11)	<b>0.022</b>
	(%)	(%)	
Educational level			<b>&lt;0.001</b>
Health vocational high school	0	3.5	
Associate's degree	0	2.3	
Bachelor's degree	75	88.5	
Master's degree	25	5.4	
Doctorate degree	0	0.4	
Are you on night shift in the hospital?			<b>0.002</b>
Yes	52.8	76.2	
No	47.2	23.8	
Do you have any chronic disease?			<b>0.035</b>
Yes	38.9	23.3	
No	61.1	76.7	
Have you attended seminars, conferences, or training programs about organ donation?			<b>&lt;0.001</b>
Yes	77.8	40.6	
No	16.7	50.0	
I'm not sure	5.6	9.4	
Do religion or opinion leaders' views affect your decision to donate organs?			0.056
Yes	5.6	15.6	
Partially	27.8	37.3	
No	66.7	47.1	
Do you think there is a legal regulation in our country regarding organ donation?			<b>0.002</b>
Yes	77.8	47.7	
No	8.3	10.8	
No idea	13.9	41.5	
Do you think the Presidency of Religious Affairs has a fatwa on organ donation?			<b>&lt;0.001</b>
Yes	66.7	32.7	
No	5.6	9.0	
No idea	27.8	58.3	
Do you think organ donation is appropriate in terms of religious rules/beliefs?			<b>0.005</b>
Yes	80.6	52.7	
No	2.8	10.0	
No idea	16.7	37.3	
Do you know where to apply for organ donation?			<b>&lt;0.001</b>
Yes	88.9	50.4	
No	11.1	49.6	
Do you believe that a patient with brain death might come back to life?			<b>0.041</b>
Yes	5.6	1.5	
No	86.1	65.8	
No idea	8.3	17.7	
Would you donate the organs of your relative who had brain death?			<b>&lt;0.001</b>
Yes	86.1	30.2	
No	2.8	20.2	
I'm not sure	6.5	49.6	

IQR: Interquartile rang.

a relative of them had undergone organ transplantation. Following a possible diagnosis of brain death of a relative, 33.8% of the nurses said that they would consent for organ donation to him, whereas 47.1% were not sure about this issue. Among the nurses, 76.6% agreed on a possible living-related organ donor for a close relative and 53.3% accepted receiving an organ from a close relative when required. Opinions of the nurses for increasing organ donation pool are as follows: Organizing campaigns in public institutions related to organ donation (58.1%), giving a sermon about organ donation in mosques and foundations (57.0%), providing some social opportunities and benefits to organ donors (54.3%), organizing educational seminars in schools in annual periods (51.2%), providing financial support to organ donors by the state (46.0%), reduction of prison sentences for some prisoners who donate organs (19.6%), and granting citizenship to relatives of foreign nationals who donate organs (8.6%). Perspectives of the nurses on organ donation and their knowledge, attitude, and behavior are summarized in Table 2.

### Comparison of Participants who Donated and those who did not

Participants included in this study were divided into two groups, nurses who donated their organs as Group A ( $n=36$ ) and nurses who did not donate their organs as Group B ( $n=520$ ). According to the survey responses, nurses who donated their organs (Group A) have relatively longer working time as a professional nurse ( $p=0.022$ ). They are more educated and have a higher graduate level ( $p<0.001$ ). Group A nurses were also found to be working relatively more frequently in daytime shifts ( $p=0.02$ ), attending seminars and conferences about organ donation more frequently ( $p<0.01$ ), and are less influenced by the opinions of religious leaders and conviction leaders ( $p=0.056$ ). Furthermore, Group A nurses were found to be relatively more aware of national legal regulations for organ donation ( $p=0.02$ ), be somewhat more aware of the regional statement of the Religious Affairs Association concerning consent for organ donation ( $p<0.01$ ), and more informed about the compatibility of organ donation with religion beliefs ( $p=0.005$ ). Nurses who donated their organs (Group A) also found to relatively know better where to apply for organ donation ( $p<0.001$ ), be relatively keener to give consent for deceased donation in case of brain death of a close relative ( $p<0.001$ ), and belief significantly more in the irreversibility of life following brain death (86.1% vs. 65.8%;  $p=0.041$ ). Details about groups are summarized in Table 3.

## DISCUSSION

The critical shortage of cadaveric donor organs for transplant remains to be the major obstacle for transplantation. The need for organ donation increases worldwide, including Türkiye, due to organ insufficiencies caused by chronic disease. According to the Turkish Ministry of Health, in 2015, 935 patients per million population had kidney failure; out of which only 17.4% underwent organ transplantation [2]. Furthermore, due to the inadequate liver donors, thousands of candidates were waiting for organ transplantation in Türkiye; <30% received an organ in 2017 [3]. Therefore, it is essential to promote organ donation so as to avoid mortality on the waiting list.

The previous studies showed that Türkiye's adult and youth population have inadequate organ donation knowledge [6–8]. These studies advocate for public education programs to increase awareness among the general population about legislation related to organ donation. Nurses are regarded as the key players in the organ donation process. They care for a wide range of patients, including potential organ donors or organ transplant recipients. In addition, a nurse may be the first person to identify potential donors as they spend more time with the patients and their families and help prevent the loss of transplantable organs by obtaining family consent for organ donation. Furthermore, nurses' knowledge and attitude regarding organ donation can influence public opinion and the relatives' decision about deceased organ donation [9]. Knowledge and perceptions about organ donation are positively associated with attitudes to donation, willingness to donate, and donor registration [6, 10]. Hence, nurses can play a significant role in maximizing the pool of potential donors by participating in educational campaigns designed to promote national awareness and attitude toward organ donation. Utilizing the total capacity of nurses to encourage organ donation in the country will largely depend on preparing them with adequate knowledge and an enhanced attitude toward organ donation. In this study, nurses showed a relatively positive attitude toward organ donation.

However, most nurses are unwilling to donate their organs. In case of need for a living-related donation for a relative, 76.6% of the participants stated being a volunteer, whereas 52.3% stated that they would accept receiving an organ from a relative. On the other hand, the responses showed that only 6.5% of the nurses donated their organs. While 31.9% stated that they are ready to consider organ donation in the future, 41.3% were not

decided about organ donation yet, and 27% rejected organ donation in any condition.

Several researchers showed that nurses had positive attitudes toward posthumous organ donation [11, 12]. Vlasisavljevic et al. [12], in a cross-sectional study involving 291 nurses from the Clinical Center of Serbia, Belgrade, found that the large majority of nurses (91%) would accept organ transplant if needed. Still, only 32.0% would be organ donors, and only 0.3% owned a donor card. In another study from Qatar, Alsaied et al. [11] showed that health-care professionals, including nurses, have an acceptable level of knowledge and fairly positive attitudes toward organ donation and transplantation. Yet, they suggest that much work is yet to be done before organ donation and transplantation can become fully accepted by the medical community [13]. Xie and colleagues [14] reported that the attitude toward donation and transplantation in the hospitals in China was not too optimistic and recommended improvement in the training regarding transplantation and donation among nurses in China. The study further stressed that nurses are an important group who generate opinions in the patient population. Their negative attitudes can significantly impact society's attitudes toward organ donation [14]. The study also identified a significant correlation between the nurse's education and knowledge about organ donation and the nurse's experience caring for organ donors/recipients and attitudes regarding organ donation.

This survey also demonstrates a considerable lack of knowledge about organ donation. Nearly half of the nurses knew about national legal regulations for organ donation, while 39.7% of the nurses did not know about this issue, most of them did not know where to apply for organ donation registration. More than half of the nurses stated that they are not informed about the religion statement of the Religious Affairs Association about organ donation. About 36% did not have any idea about this issue. Ozdag [15] found that only 10.8% of their nurse participants knew the organ Turkish donation law. Similar results about nurses knowledge and awareness about organ donation regulations have been demonstrated in other countries in different studies, and while knowledge of organ donation was not very satisfactory, it was significantly positively associated with organ donation registration [16–21].

Regarding knowledge and perception about brain death, 15.8% of the participants stated that brain death

is reversible, whereas another subgroup of 17.1% is not sure about this issue. Furthermore, this investigation showed that nurses who reported attending previous seminars, conferences, or training programs about organ donation have significantly better donation rates and stronger attitudes toward organ donation. The donation rate was found to be significantly correlated with the nurse's educational level. Nurses who donated their organs are found to know better about brain death irreversibility, understand better the related national legal regulations for organ donation, and are more informed about the compatibility of organ donation with religious beliefs. The literature also suggested that there appeared to be insufficient knowledge on nurses regarding organ procurement [11–16]. In addition, previous education about organ and tissue donation was shown in the previous studies to have a positive impact on donation and transplantation rates [11–16]. These findings suggest the need for a professional education strategy to cover the entire donation process.

The most important motivation for nurses for organ donation in this study was saving lives (80.5%), the social responsibility that is expected from every individual (66.7%), and the possible need of a relative for organ transplantation in the future (33.3%). The opinions of religious leaders and conviction leaders about organ donation do not influence 48.4% of the nurses, whereas it only partially influences 36.7% of them. Weng and colleagues [17] studied the factors associated with registration for organ donation among clinical nurses. The results of logistic regression showed that higher age (odds ratio (OR)=1.03,  $p<0.001$ ), better knowledge of organ donation (OR=1.09,  $p<0.001$ ), and a positive attitude toward organ donation (OR=2.91,  $p<0.001$ ) were positively associated with organ donation registration.

## Conclusion

This study showed a relatively positive attitude of nurses regarding organ donation; however, a small percentage of them donated their organs. The study showed that the knowledge level correlated with donation rate and suggests that educational programs about organ donation and transplantation are needed before the full potentials of nurses in organ donation campaigns, and the whole transplant process can be utilized efficiently. Further research is required to understand the nature of nurses' attitudes about donation and seek other possible interventions that may improve this attitude and hence.

**Ethics Committee Approval:** The Inonu University Non-interventional Clinical Research Ethics Committee granted approval for this study (date: 07.01.2020, number: 2020/ 227).

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