JOURNAL OF
CONTEMPORARY MEDICINE

DOI:10.16899/jcm.1246092
J Contemp Med 2023;13(4):586-592

Original Article / Orijinal Araştırma

Determination of Awareness and Knowledge Level on Brain Death, Organ Donation and Transplantation in Intensive Careers in Konya

Konya İli Yoğun Bakım Çalışanlarında Beyin Ölümü, Organ Bağışı ve Nakli Konusundaki Farkındalık ve Bilgi Düzeyinin Belirlenmesi

Mustafa Tomruk[1], Funda Gök[2], Esma Eroğlu[3]

[1]Meram State Hospital, Department of Anesthesiology and Reanimation, Konya, Turkey
[2]Necmettin Erbakan University Meram Faculty of Medicine, Department of Anesthesiology and reanimation, Konya, Turkey
[3]Meram State Hospital, Department of Infectious Diseases and Clinical Microbiology, Konya, Turkey

Abstract

Aim: It is shown that there is a lack of social and individual information on organ transplantation and donation, and as a result, organ donation is not sufficient due to social and individual insensitivity. In our study, we aimed to evaluate the level of awareness, attitude and knowledge about brain death, organ donation and transplantation in intensive care workers of hospitals in Konya.

Material and Method: A total of 219 healthcare professionals, 144 nurses and 75 doctors, who agreed to meet face-to-face with the researcher, who were working in Konya province state hospitals, university hospitals and private hospital intensive care units, were included in the study. The data of the study were collected using the 'Data Collection Form', which was created as a result of the literature review and includes demographic information.

Results: A total of 219 health care workers participated in the study with 144 (65.8%) intensive care nurses and 75 (34.2%) intensive care physicians. There was an organ donation card of 13.2% (n: 29) of the participants. There were 16.7% (n: 24) nurses and 6.7% (n: 5) doctor donation cards in doctors. In the case of brain death, 56.9% of participants wanted their organs to be donated. In the case of brain death, 58.7 of those who did not accept organ donation did not feel ready. 21% (n: 46) previously participated in organ / tissue donation and transplantation, 16.9% (n: 37) previously participated in brain death related trainings. Among the doctors who participated in the study 37.8% (n: 28) Electroencephalography (74%) and Radionuclide Cerebral Scintigraphy (62%) are the most common supportive tests used for the diagnosis of brain death.

Conclusion: Nursing and doctors' support of tissue / organ donation and transportation does not affect having donation card. There is no significant difference between the general knowledge levels of anesthesia and other branch physicians about brain death, but anesthesia doctors have been found to be more experienced in diagnosing brain death. We believe that the positive attitudes of the intensive care workers on this subject and the sufficient level of knowledge will positively affect the amount of organ donation.

Keywords: Intensive care unit, brain death, organ donation, organ transplantation

Öz

Amaç: Organ nakli ve bağışı konusunda toplumsal ve bireysel bilgi eksikliği olduğu ve bunun sonucunda toplumsal ve bireysel duyarsızlığa bağlı organ bağışının yeterli olmadığı gösterilmektedir. Çalışmamızda Konya ilinde bulunan hastanelerin yoğun bakım çalışanlarında beyin ölümü, organ bağışı ve nakli ile ilgili olarak farkındalık, tutum ve bilgi düzeylerini değerlendirmeyi amaçladık.

Gereç ve Yöntem: Çalışmaya Konya ili devlet hastaneleri, üniversite hastaneleri ve özel hastane yoğun bakımlarında görev yapan araştırmacı ile yüz yüze görüşmeyi kabul eden 144 hemşire ve 75 doktor olmak üzere toplam 219 sağlık çalışanı oluşturmuştur. Araştırmanın verileri, literatür taraması sonucu oluşturulan ve demografik bilgilerin de yer aldığı 'Veri Toplama Formu' kullanılarak toplanmıştır

Bulgular: Çalışmaya 144 (%65,8) yoğun bakım hemşiresi ve 75 (%34,2) yoğun bakımda çalışan doktor toplam 219 sağlık çalışanı katıldı. Katılımcıların %13,2 (n:29)'sinin organ bağışı kartı vardı. Hemşirelerde %16,7 (n:24), doktorlarda %6,7 (n:5) oranında organ bağış kartı vardı. Beyin ölümü durumunda katılımcıların %56,9'sı organlarının bağışlanmasını istemiştir. Beyin ölümü durumunda organ bağışını kabul etmeyenlerin 58,7 kendini hazır hissetmediklerini belirtmiştir. Organ/doku bağışı ve nakli konusunda daha önce eğitime katılanlar %21 (n:46), beyin ölümü ile ilgili eğitimlere daha önce katılanlar %16,9 (n:37) du. Çalışmaya katılan doktorlardan haha önce apne testi uygulayan %37,8 (n:28) di. Beyin ölümü tanısı için kullanılan destekleyici testlerden en çok bilinilenleri Elektroensefalografi (%74) ve Radyonüklid Serebral Sintigrafi (%62)'dir.

Sonuç: Hemşire ve doktorların doku/organ bağışı ve naklini destekleme durumu bağış kartına sahip olma durumunu etkilememektedir. Anestezi ve diğer branş doktorlarının beyin ölümü ile ilgili genel bilgi düzeyleri arasında belirgin bir fark yoktur fakat anestezi doktorlarının beyin ölümü tanısı koyma konusunda daha deneyimli olduğu görülmüştür Yoğun bakım çalışanlarının bu konudaki tutumlarının olumlu, bilgi düzeylerinin yeterli olması organ bağışı miktarını olumlu yönde etkileyeceği kanaatindeyiz.

Anahtar Kelimeler: Yoğun bakın ünitesi, beyin ölümü, organ donör, organ bağışı, organ nakil

Corresponding *(İletişim)*: Mustafa Tomruk, Meram State Hospital, Department of Anesthesiology and Reanimation, Meram, Konya, Turkey
E-mail *(E-posta)*: mustafatomruk84@gmail.com
Received *(Geliş Tarihi)*: 01.02.2023 **Accepted *(Kabul Tarihi)*:** 28.03.2023

INTRODUCTION

Organ donation is defined as the voluntary consent of a person to use his/her tissues and organs for the treatment of other patients while alive or after medical death.[1] Tissue and organ transplantation is one of the values that show the level of progress of countries in the field of health. Health workers providing information on this issue can positively influence the decision of potential organ donor families. Therefore, in order to increase organ donation, it is necessary to increase the knowledge of healthcare professionals on this subject.[2,3] The most important point to remember in organ transplantation is that organ transplantation cannot take place without a donor. The transplantation of organs obtained from cadavers to the most suitable recipient is another important problem. This problem necessitates organ sharing and organ harmonization. As a matter of fact, strong organizations such as Eurotransplant and UKTSSA in Europe and United Network for Organ Sharing (UNOS) in the USA are also active in organ sharing. In Türkiye, the organization is carried out according to the 'Organ and Tissue Transplantation Services Regulation' published in the official gazette dated 01/06/2000 and numbered 24066 and the National Organ and Tissue Transplantation Coordination System Directive published in January 2001.[4] When the studies conducted in our country on organ transplantation and donation are examined, it is shown that there is a lack of social and individual knowledge as well as lack of organization on the subject and as a result, organ donation is not sufficient due to social and individual insensitivity.[2] Studies have found an increase in the number of people who will accept organ donation after training on brain death and organ transplantation.[5,6]

In this study, we aimed to determine the knowledge and tendencies of intensive care unit staff (resident physicians, specialist physicians and nurses) about brain death, organ donation and transplantation, and to establish a prospective basic knowledge on this subject.

MATERIAL AND METHOD

The study was conducted between August-December 2017 in province of Konya, state hospitals, medical faculty hospitals and private hospital intensive care units. 270 healthcare workers working in intensive care were asked to participate in the questionnaire. A total of 219 (%81.1) healthcare workers, including 144 nurses and 75 doctors, who agreed to face-to-face interviews with the researcher, were included in the study. The study was initiated with the decision of Local Ethics Committee dated 16.06.2017 and numbered 2017/978. The data of the study were collected using the 'Data Collection Form', which was created as a result of the literature review and included demographic information.

Data Collection

The data of the study were collected by using the 'Data Collection Form' which was created as a result of literature review and included demographic information in order to reveal the awareness, attitude and knowledge levels of intensive care unit staff about brain death, organ donation and transplantation.[7,8]

Data Collection Form

The data collection form consists of 3 sections and 54 questions. The first section includes 10 questions to determine demographic characteristics. The second section includes 22 closed-ended, open-ended and multiple-choice questions to determine the level of knowledge, awareness and attitudes towards brain death and organ transplantation among the nurses and doctors included in the study. Questions such as Do you have relatives waiting for organ transplantation, Do you have an organ donor card, which organs and tissues can be transplanted, From whom can organ transplantation be performed, which organs and tissues can be taken without the need for family permission unless otherwise declared, Which health institutions in the province of Konya serve as transplantation centers, Is the institution you work for an organ procurement center, Has there been a case of brain death in the intensive care unit where you work, were asked to measure awareness, attitude, and knowledge level. The third section includes 22 questions about the level of brain death knowledge only for the doctors participating in the study. Questions were asked to determine the level of knowledge about the definition and diagnosis of brain death and awareness of the diagnostic methods used.

Statistical Analysis

The data obtained after the application were transferred to the computer environment and evaluated in the Statistical Packace For The Social Sciences (SPSS) for Windows 20 program. In the statistical evaluation of the data, categorical data were tabulated as numbers and percentages. Significance was evaluated at $p<0.05$ level. Continuous variables were analyzed by Chi-square test and presented as mean±standard deviation. Demographic variables were given as frequency percentages (%).

RESULTS

A total of 219 health care professionals, 144 (65.8%) intensive care nurses and 75 (34.2%) physicians working in intensive care, participated in the study. The ages of the health care professionals who participated in the study were between 19-45 years and the mean age was 28.60±5.9. The mean age of the physicians who participated in the study was 30.60±4.3, while the mean age of the nurses was 27.56±6.4. When both groups were compared in terms of age, there was a significant difference (p=0.00). Demographic data of the health personnel participating in the study are given in **Table 1**.

The answers to the questionnaire are shown in **Tables 2** and **3**. To the question "Do you have an organ donor card?" 120 (83.3%) of the nurses answered no, while 70 (93.3%) of the physicians answered no. A statistically significant difference was observed (p=0.038) (**Table 2**). When asked about the reasons for not considering organ donation, 20 out of 32 nurses (62.5%) and 7 out of 14 doctors (50%) answered "I do not feel ready". There was no statistically significant difference (p=0.381).

Table 1. Sociodemographic Characteristics of Participants

		Number	Percent
Gender			
Female		140	63.9
Male		79	36.1
Age			
Physician		30.6 ± 4.3	
Nurse		27.5 ± 6.4	
Position Status			
Physician		144	65.8
Nurse		75	34.2
Education Status			
High School		56	25.6
Associate Degree		29	13.2
Bachelor's degree		51	23.3
Master's Degree		83	37.9
Profession, if any			
Brain Surgery		5	6.7
Cardiology		3	4
Anesthesia		32	42.7
General Surgery		6	8
Emergency		11	14.7
Pediatrics		4	5.3
Internal Medicine		5	6.7
Pulmonary disease		5	6.7
Neurology		4	5.3
Your Current Institution			
Public Hospitals		34	15.5
Medical faculty hospitals		113	51.6
Private Hospitals		47	21.5
Blank		25	11.4
Number of Months If You Are a Specialization Student			
0-30		21	38.9
30-60		27	50
60 and above		6	11.1
How many years in the profession (year)			
	Nurse	1-5	63 (43.8)
		5-10	41 (28.5)
		10-15	25 (17.4)
		15-20	8 (5.6)
		20-25	5 (3.5)
		≥ 25	2 (1.4)
	Physician	1-5	51 (68)
		5-10	18 (24)
		10-15	5 (6.7)
		15-20	1 (1.3)
		20-25	-
		≥ 25	-
Duration of Work in Intensive Care Unit (year)			
	Nurse	1-5	86 (59.7)
		5-10	39 (27.1)
		10-15	12 (8.3)
		15-20	3 (2.1)
		20-25	3 (2.1)
		≥ 25	1 (0.7)
	Physician	1-5	72 (96)
		5-10	3 (4)
		10-15	-
		15-20	-
		20-25	-
		≥ 25	-

Table 2. Survey data Section 1

		N (%)
Do you have an organ donor card?		
Nurse	Yes	24 (16.7)
	No	120 (83.3)
Physician	Yes	5 (6.7)
	No	70 (93.3)
If you have not donated your organs, would you consider donating them?		
No idea		53 (27.9)
Yes		108 (56.9)
No		29 (15.2)
If no, what are the reasons? *		
I don't think organ donation is right	Nurse	2 (6.2)
	Physician	0
For religious reasons	Nurse	7 (21.9)
	Physician	5 (35.7
I don't feel ready	Nurse	20 (62.5)
	Physician	7 (50)
The idea of post-mortem surgery	Nurse	0
	Physician	1 (7.1)
Thinking that organ donation will affect my medical treatment	Nurse	3 (9.4)
	Physician	1 (7.1)
Do you know anyone waiting for an organ transplant?		
No idea		11 (5)
Yes		37 (16.9)
No		171 (78.1)
Do you have relatives who donated organs after brain death?		
No idea		33 (15.1)
Yes		25 (11.4)
No		161 (73.5)
If your 1st degree relative is brain dead, would you accept organ donation?		
Yes		153 (69.9)
No		57 (26)
No answer		9 (4.1)
If no, what is the reason?		
I don't want to take responsibility for this		26 (11.9)
I don't think organ donation is right.		5 (2.3)
I think that my environment and other family members will misunderstand me		10 (4.6)
I don't think it's religiously appropriate.		9 (4.1)
I think organ donation will affect the medical treatment of that person		6 (2.7)
Have you ever participated in training on organ/tissue donation and transplantation?		
Yes		46 (21.0)
No		173 (79.0)
Which organs and tissues can be transplanted		
Cornea		203 (92.3)
Lung		163 (74.1)
Bone marrow		167 (75.9)
Kidney		207 (94.1)
Liver		202 (91.8)
Spleen		63 (28.6)
Heart		199 (90.5)
Blood		148 (67.3)
Small intestine		59 (26.8)
Pancreas		85 (38.6)
From Whom Organ Transplantation is Performed		
No opinion		6 (2.7)
Cadaver		25 (11.4)
Live		42 (19.2)
Cadaver+Live		146 (66.7)
Which organs and tissues can be harvested without the need for family consent unless otherwise declared?		
Cornea		138 (68.7)
Kidney		2 (1.0)
Blood		32 (15.9)
Cornea+Kidney+Blood		3 (1.5)
Cornea+blood		20 (10.0)
Spleen+Kidney		1 (0.5)
Cornea + Spleen		4 (2.0)
Spleen+Kidney+Blood		1 (0.5)

*More than one option is marked.

Table 3. Survey data Section 2

	Other specialty doctors n(%)	Anesthesiologists n(%)	Total n (%)
The Regulations of the Ministry of Health of the Republic of Türkiye clearly state how to proceed in patients diagnosed with Brain Death and not accepted as organ donors			
No idea	20 (47.6)	12 (37.5)	32 (43.2)
True	21 (50)	20 (62.5)	40 (55.4)
False	1 (2.4)	0	1 (1.4)
Each country has different diagnostic criteria and requirements for the diagnosis of brain death, as set out in their own laws.			
No idea	15 (34.9)	6 (18.8)	21 (28)
True	20 (46.5)	17 (53.1)	37 (49.3)
False	8 (18.6)	9 (28.1)	17 (22.7)
In a patient considered brain dead, the diagnosis should be definitive and the disease should be incurable.			
No idea	1 (2.3)	1 (3.1)	2 (2.7)
True	37 (86)	31 (96.9)	68 (90.7)
False	5 (11.6)	0	5 (6.7)
In the presence of cardiopulmonary resuscitation or similar hypoxic ischemic acute brain injury, at least how long should elapse before evaluation of the main clinical examination finding?			
6 hours	4 (11.4)	1 (3.3)	5 (7.7)
12 hours	6 (17.1)	4 (13.3)	10 (15.4)
24 hours	14 (40)	15 (50)	29 (44.6)
48 hours	9 (25.7)	10 (33.3)	19 (29.2)
Deep tendon reflexes can be obtained in a brain dead patient.			
No idea	15 (34.9)	3 (9.4)	18 (24)
True	19 (44.2)	14 (43.8)	33 (44)
False	9 (20.9)	15 (46.9)	24 (32)
Brain dead patients may have spinal reflexes and automatisms.			
No idea	16 (37.2)	3 (9.4)	19 (25.3)
True	23 (53.5)	24 (75)	47 (62.7)
False	4 (9.3)	5 (15.6)	9 (12)
The presence of autonomic storm in a brain dead patient does not exclude brain death.			
No idea	20 (46.5)	7 (21.9)	27 (36)
True	22 (51.2)	24 (75)	46 (61.3)
False	1 (2.3)	1 (3.1)	2 (2.7)
An apnea test should be performed in the patient who is considered brain dead and a supportive test that the board of physicians deems appropriate should be added.			
No idea	2 (4.7)	2 (6.2)	4 (5.3)
True	40 (93)	30 (93.8)	70 (93.3)
False	1 (2.3)	0	1 (1.3)
I've done an apnea test before.			
Yes	6 (14.3)	22 (68.8)	28 (37.8)
No	36 (85.7)	10 (31.2)	46 (62.2)
Normothermia, normotension and normovolemia are preconditions for apnea testing.			
No idea	12 (27.9)	2 (6.2)	14 (18.7)
True	29 (67.4)	27 (84.4)	56 (74.7)
False	2 (4.7)	3 (9.4)	5 (6.7)
Before the apnea test, PaCO2 should be 35-45 mmHg and PaO2 should be above 200 mmHg with appropriate mechanical ventilation approach.			
No idea	15 (34.9)	3 (9.4)	18 (24)
True	22 (51.2)	25 (78.1)	47 (62.7)
False	6 (14)	4 (12.5)	10 (13.3)
If PaO2 cannot be brought above 200 mmHg before apnea test, apnea test should not be performed.			
No idea	22 (52.4)	3 (9.7)	25 (34.2)
True	16 (38.1)	17 (54.8)	33 (45.2)
False	4 (9.5)	11 (35.5)	15 (20.5)
An apnea test is positive if PaCO2 ≥60 mmHg at the end of the apnea test and/or if there is no spontaneous breathing despite an increase of 20 mmHg or more in PaCO2 compared to baseline.			
No idea	17 (39.5)	3 (9.4)	20 (26.7)
True	26 (60.5)	29 (90.6)	55
False	-	-	-
In patients who are considered brain dead, irreversible severe structural brain damage must be demonstrated by imaging method (CT, MRI).			
No idea	6 (14)	4 (12.5)	10 (13.3)
True	23 (53.5)	20 (62.5)	43 (57.3)
False	14 (32.6)	8 (25)	22 (29.3)
If the apnea test cannot be completed, the diagnosis of brain death can be made with supportive tests deemed appropriate by the board of physicians.			
No idea	12 (29.3)	5 (15.6)	17 (23.3)
True	28 (68.3)	24 (75)	52 (71.2)
False	1 (2.4)	3 (9.4)	4 (5.5)
Which supportive tests can be used for the diagnosis of brain death? (More than one option can be marked)			
Electroencephalography	34 (79)	22 (68)	56 (74)
Sensory evoked potentials	16 (37)	13 (40)	29 (38)
Transcranial Doppler ultrasonography	19 (44)	22 (68)	43 (57)
Radionuclide cerebral scintigraphy (SPECT)	28 (65)	19 (59)	47 (62)
CT angiography	20 (46)	23 (71)	43 (57)
Catheter cerebral angiography	16 (37)	16 (50)	32 (42)
All of them	3 (6)	6 (18)	9 (12)

DISCUSSION

The most impressive situation in our study was that although the participants viewed organ donation positively, most of them did not have an organ donation card. Considering that organ donation has become an increasingly important concept, our study also emphasizes the importance of this situation. Considering that every individual may need organ donation in their life cycle, individuals should be more sensitive.[6] Another important issue was the lack of knowledge of the participants on the subject. This unfortunately showed us that many people, except those waiting for organs and their relatives, are insensitive to the issue.

In the study by Amaral et al. 144 professors working in a university hospital in Brazil were surveyed with "yes-no" statements on organ donation, brain death and donation management. As a result of the study, it was found that 87% of the professors included in the study were willing to donate organs and 69% of them knew some of the legal conditions on organ donation in Brazil. A detailed assessment of these legal conditions showed that 79% knew the content of the diagnosis of brain death, but 44% did not know how to diagnose brain death clinically. It was observed that only 26% of the participants donated organs. It was observed that 22% of the professors considered themselves competent in making the clinical diagnosis of brain death and requested organ donation from the relatives of previously brain dead patients. As a result of this study, it was observed that although professors were enthusiastic about organ donation, those who considered themselves clinically competent in this regard were in the minority.[7] Similar to our study, the proportion of people who are willing to donate organs and the proportion of people who actually have an organ donor card are similar. The lack of a functional organ donor card in our country is another factor in this low rate. In this study, although the rate of follow-up of patients diagnosed as brain-dead was lower, in our study, a higher rate of follow-up of brain-dead patients was observed. The reason for this difference may be the high number of nurses in our study or the fact that more than one nurse followed the same patient. In our study, it was observed that the number of participants who knew the legal conditions for organ and tissue transplantation in order to diagnose brain death was low. In the study by Shabanzadeh et al. a total of 418 nurses working in 24 intensive care units in Tehran were surveyed to assess their knowledge about brain death, organ and tissue donation. Accordingly, 75.6% have a positive view of organ donation and 15% have an organ donor card. Those with a positive approach see it as "for humanity", while others have a negative approach in terms of "respect for the body". 19% have relatives waiting for organ and tissue transplantation. It was observed that 54% of the respondents were positive about organ donation by their relatives in case of death.[8] In a study conducted by Cillimoğlu et al. with 415 healthcare workers and 320 students, 44% of the participants were considering organ donation and 16.6% had organ donation cards. Among those who gave negative answers, the three most common answers were 18.5% without specifying the reason, 17.3% thinking that the death decision would be made prematurely, and 16.7% not having enough information on the subject. In this study, the rate of organ donation among relatives or close relatives was 16.6%. In addition, one third of the participants knew someone who had received an organ transplant.[1] In a study conducted by Vlaisavljevic and Milutinovic among 219 nurses, 91% would accept organ transplantation if needed, but only 32% would accept to be organ donors. Only 0.3% of the participants had an organ donor card. In this study, the negative attitude of not being a donor but accepting organ transplantation in case of need stems from mistrust and denial of health policies within the country.[9] In our study, 56.6% of the participants had a positive view of organ donation and 13.2% had an organ donation card. Of the 33 respondents who had a negative attitude towards organ donation, 81% stated that they did not feel ready and 36% cited religious reasons. Participants were more likely to be in favor of organ donation in the case of the death of a first-degree relative. In other studies, the rate of those who were in favor of donating their own organs was higher than those who were in favor of organ donation in case of the death of a relative, whereas this rate was the opposite in our study. We think that this inverse ratio is due to the fact that the majority of the participants in our study did not feel ready for organ donation, but were able to make more realistic decisions about their relatives. We also think that having relatives or close relatives who have donated organs can be important in terms of observing and empathizing with the experiences of organ donation. Melo et al. evaluated knowledge and attitudes on cadaveric organ donation and transplantation directed to 495 healthcare professionals working in hospitals in Portugal with a questionnaire-based measurement. 78% of the respondents have received training on organ donation and transplantation and 62% think that they need more training. Hospital staff with a positive attitude towards donation can positively influence the attitudes of the general public. It has been suggested that successful action by hospital staff as initiators of the organ procurement process requires more knowledge and training. Lack of adequate information and training among health professionals working in places with donation programs has negatively affected organ donation rates. In this study, it was determined that the low organ donation rates were due to the difficulties in initiating the process, diagnosing brain death and providing the necessary human resources. No difference was observed in the level of knowledge between nurses and physicians in questions on specific organ donation and transplantation.[10] In our study, 21% of healthcare professionals received training on organ transplantation. Although the proportion of employees who received training in the other study was higher than in our study, it was

observed that the knowledge levels of the participants in both studies were incomplete. In a study conducted by Yılmaz et al. at the Research and Application Hospital in Eskisehir, which included 90 physicians (specialists and assistants), 200 nurses and health officers, and 24 radiology and laboratory technicians, only 13.5% of health professionals were found to be organ donors. It was also stated that they can perform 96% kidney, 83.5% heart, 74.1% liver and 62% cornea transplantation respectively. Even though they seem to be concerned with the issue, there is a prevailing view that trainings, press announcements and announcements within health institutions are insufficient. The majority of health workers in this study stated that no one except those waiting for organs emphasized the issue. Accordingly, it is understood that kidney, liver, heart and cornea are the organs known to be transplanted the most.[11] In a study by Sarıtaş et al. involving 163 physicians, 77.6% stated that the apnea test was the basis for the diagnosis of brain death, while 67.1% stated that a confirmatory test was used together with the apnea test. However, 65.6% of participants were not familiar with the apnea test. When confirmatory tests were questioned, 46.5% responded CT angiography, 24.2% Transcranial Doppler USG, and 12.1% MR angiography.[7] In the study conducted by Vlaisavljevic and Milutinovic in which 219 nurses evaluated their attitudes and knowledge about organ donation and transplantation, 63.9% of the nurses answered EEG as the most valid method in the diagnosis of brain death.[9] In our study, 93.3% of doctors said that brain death is the complete and irreversible loss of all brain and brain stem functions. Anesthesia and other branch doctors answered yes to this question at the same rate (93%). 93.3% of all doctors said that an apnea test and a supportive test should be performed in a patient considered brain dead. It was observed that the proportion of anesthesia and other branch doctors who answered this question correctly was equal (93%). When confirmatory tests were questioned, 74% EEG, 62% SPECT, 57% CT angiography, 54% transcranial Doppler USG responses were obtained. Of all doctors, 37.8% said they had previously performed an apnea test. While this rate is 68.8% for anesthesia doctors, it is 14.3% for other branch doctors.56% said that if the relatives of the patient do not accept organ transplantation after the diagnosis of brain death, the body should be handed over to the patient's relatives. There was no significant difference between the general knowledge levels of 51 anesthesia and other branch physicians about brain death, but anesthesia physicians were more experienced in diagnosing brain death. The knowledge level of the participants in our study on apnea testing and other confirmatory tests was higher than the rates in the other study. Kocaay et al. evaluated the knowledge, awareness and attitudes of 341 participants from the departments of medicine, law, nursing and communication, who may be involved in organ transplantation processes in the future, especially regarding the process of finding a suitable organ through a questionnaire. As a result, it was determined that especially nursing and medical students wanted to be organ donors, but only 2% of them had organ donor cards. While the majority thought that organ donation was religiously appropriate, some (5%) thought that it was a sin.[12] In our study, 5.5% did not consider it religiously inappropriate.

CONCLUSION

We think that the positive attitudes and adequate level of knowledge of intensive care unit staff on this issue will positively affect the amount of organ donation because they are more together with the relatives of patients waiting for organ transplantation, transplanted patients and brain-dead patients. In-service training for healthcare professionals in intensive care units may be considered in the future.

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of Necmettin Erbakan University Meram Medical Faculty Local Ethics Committee (Date: 16.06.2017, Decision No: 2017/978).

Informed Consent: Because the study was designed retrospectively, no written informed consent form was obtained from patients.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Cillimoğlu AÖ, Yılmaz S. Adnan Menderes Üniversitesi Hastanesi Personelinin Organ-Doku Bağışı ve Nakli Hakkındaki Bilgi ve Düşünceleri. Turk Neph Dial Transpl. 2016;25(3):254-62.
2. Najafizadeh K, Shiemorteza M, Jamali M, Ghorbani F, Hamidinia S, Assari S, Moghani-Lankarani M. Attitudes of medical students about brain death and organ donation. Transplant Proc. 2009;41(7):2707.
3. Michael GE, Jesus JE. Treatment of potential organ donors in the emergency department: a review. Ann Emerg Med. 2012;60:485-91.
4. Yüceçetin L. Organ Nakli ve koordinatörlüğünün tarihçesi. Yüceçetin L. ed. Organ Nakli Koordinasyonu El Kitabı, 1. basım, 2002;18-9.
5. Hammad S, Alnammourah M, Almahmoud F, Fawzi M, Breizat AH. Questionnaire on Brain Death and Organ Procurement. Exp Clin Transplant. 2017;15(Suppl 1):121-3.
6. Üstündağ H, Gül A, Zengin N, Aydın M. Böbrek Nakli Yapılan Hastalarda Yaşam Kalitesi. F.Ü. Sağ. Bil. Tıp Derg. 2007;2(6).
7. Amaral AS, Roza BA, Galvão FH, Jardim KM, Medina-Pestana JO. Knowledge of organ donation among one group of Brazilian professors of medicine. Transplant Proc. 2002;34(2):449-50.
8. Shabanzadeh AP, Sadr SS, Ghafari A, Nozari BH, Toushih M. Organ and tissue donation knowledge among intensive care unit nurses. Transplant Proc. 2009;41(5):1480-2.

9. Vlaisavljević Z, Milutinović D, Milićić B, Jesić-Vukićević R. Attitudes and knowledge of nurses on organ legacy and transplantation. Srp Arh Celok Lek. 2014;142(3-4):213-8.
10. Melo J, Batista A, Teixeira A, et al. Knowledge and behavior among health professionals in relation to cadaveric organ donation and transplantation: a questionnaire-based analysis in Portuguese hospitals. Transplant Proc. 2011;43(5):1429-33.
11. Yılmaz E. Sağlık Çalışanlarının Organ Nakli ve Bağışına İlişkin Düşünceleri. Eskişehir-2006.
12. Kocaay AF, Celik SU, Eker T, Oksuz NE, Akyol C, Tuzuner A. Brain Death and Organ Donation: Knowledge, Awareness, and Attitudes of Medical, Law, Divinity, Nursing, and Communication Students. Transplant Proc. 2015;47(5):1244-8.