Original Article

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Attitude and Knowledge of Intensive Care Nurses About Organ Donation

Yoğun Bakım Hemşirelerinin Organ Bağışı Hakkındaki Tutum ve Bilgisi

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ABSTRACT

Objective: Intensive care nurses make a significant contribution to the donation process by providing communication between donor and recipient families. Hence, their knowledge and attitude are important to increase the rate of organ donation. This research aimed to determine the knowledge and attitudes of intensive care nurses about organ donation.

Methods: The study was a cross-sectional design. The aim of this study was to determine the knowledge and attitudes of intensive care nurses about organ donation. The number of samples was determined according to the nurse layer weight of these hospitals: 311 volunteer intensive care nurses formed the sample. The data were collected using a valid and reliable "Organ Donation Attitude Scale" and "Organ Donation Information Scale".

Results: The mean age of the nurses was 27.28±6.08. The majority of the intensive care nurses included in the study were young, their attitudes towards organ donation were positive, and their knowledge on organ donation was at a good level. Most of the nurses did not have an organ donor card (98.4%). Positive organ donation attitude score in young nurses (p=0.012), male nurses (p=0.049), nurses with low-education level (p=0.002), nurses working in a private university or training/research hospital (p=0.007) and nurses working in neurosurgery, emergency intensive care (p=0.001) was lower. ODI score was higher in nurses with undergraduate and higher education (p=0.001), nurses working at education/research university hospital and state university hospital (p=0.003). There

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Amaç: Yoğun bakım hemşireleri verici ve alıcı aileler arasında iletişim sağlayarak, bağış sürecine önemli katkı sağlarlar. Bu nedenle bilgi ve tutumları organ bağış oranının artırılmasında önemlidir. Bu araştırma, yoğun bakım hemşirelerinin organ bağışı konusundaki bilgi ve tutumlarını belirlemeyi amaçlamaktadır.

Yöntemler: Çalışma kesitsel bir tasarımdır. Çalışma İstanbul'daki düzey 3 yetişkin hasta yoğun bakımı olan üniversite hastanelerinde yapıldı. Örneklem sayısı hastanelerin hemşire tabaka ağırlığına göre belirlendi; 311 gönüllü yoğun bakım hemşiresi örneklemi oluşturdu. Veriler, "Organ Bağışı Tutum Ölçeği ve "Organ Bağışı Bilgi Ölçeği" kullanılarak toplandı.

Bulgular: Hemşirelerin yaş ortalaması 27,28±6,08 idi. Araştırmaya alınan yoğun bakım hemşirelerinin çoğu gençti, organ bağışı tutumları olumluydu, organ bağışı konusundaki bilgileri iyi düzeydeydi. Hemşirelerin çoğunun organ bağışçısı kartı yoktu (%98,4). Pozitif organ bağışı tutum puanı; genç (p=0,012), erkek (p=0,049), düşük eğitim düzeyli (p=0,002), özel üniversite ya da eğitim/araştırma hastanesinde çalışan (p=0,007) ve nöroşirürji servisinde ve acil yoğun bakımında çalışan (p=0,001) hemşirelerde daha düşüktü. Organ bağışı bilgi puanı lisans ve üzeri eğitimli (p=0,001) ile eğitim/araştırma üniversite hastanesinde ve devlet üniversite hastanesinde çalışan hemşirelerde (p=0,003) daha yüksekti.

Sonuç: Hemşirelerin organ bağışı tutumunda bazı klinik ve sosyodemografik karakteristiklerin rolü önemlidir. Ancak organ

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was an inverse correlation between negative and positive attitude about organ donation (p=0.029).

Conclusion: Some clinical and sociodemographic characteristics of nurses are important in organ donation attitudes. However, although it is recommended that nurses with a high level of education work in this field to have a high level of knowledge about organ donation, this is not enough. Continuous training of nurses on this subject is required after graduation.

Keywords: Organ donation, knowledge, attitudes, intensive care unit nurse

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bağışı konusundaki bilgi düzeyleri için eğitim düzeyi yüksek hemşirelerin bu alanda çalışması önerilse de bu yeterli değildir. Hemşirelerin mezuniyet sonrası bu konuda sürekli eğitimleri gereklidir.

Anahtar Sözcükler: Organ bağışı, bilgi, tutum, yoğun bakım hemşiresi

Introduction

Organ donation begins with determining which patients can be suitable donors (1,2). In UK, the rate of donations from donors after brain death is 99% and the rate of processing families for donation is 91% (3). According to a research in Turkey, which covers the period between 2013 and 2017, organ donation could not be made in 74.3% of the patients with brain death, because their legal relatives did not give permission (4). According to the 2021 data of the Turkey Health Services General Directorate, Department of Tissue, Organ Transplantation and Dialysis Services, only 300 families of patients with brain death (1,370 patients) allowed organ donation (5).

Intensive care nurses play an important role in identifying and increasing the number of potential organ donors (1,2,6,7). The Organ Transplant Coordination System is largely run by nurses in the USA and entirely in the UK. In this area, intensive care unit (ICU) specialists and nurses work together in Spain, where the organ transplantation process is globally regarded as a best practice (8,9). Turkey, which ranks first in terms of live organ donation in Europe and in the world (53.02 pmp), follows the example set by Spain in order to solve cadaveric organ donation (7.54 pmp) deficiency (9-11). There is a big deficit between patients waiting for transplants and organ donors and the reason for this can be rooted in legal, religious or educational matters. However, health professionals' knowledge levels and behaviours in regard to, and attitudes towards organ donation and transplantation have a positive impact on organ donation rates. Especially ICU nurses play a special role in the organ donation process from the point of identifying and assessing potential donors and supporting their families (8,12-14). These nurses can communicate with relatives of patients with brain death and encourage them to donate organs (1,15). These expectations have increased the academic interest in ICU nurses' attitudes towards and knowledge in term of organ donation. Currently, there are studies on the key role played by nurses in the organ donation process, particularly with regard to their roles as an organ donation counsellor (7,12,15). If nurses are not aware of their own feelings towards organ donation, they may not be effective in term of obtaining consent for organ donation from a family in grief. Nurses who have personal donors cards can present a more convincing approach for the relatives of the patient (8,14-17).

Studies draw attention to the importance of knowledge and skill levels of nurses in terms of extending potential donor pool (3,7,16,18). This is because while nurses provide care for patients, they can take early action at the onset of brain death, using the data which they gather.This means timely medical treatment and maintenance (i.e. mechanical ventilation and vasopressor support) in order to preserve the organs to be transplanted. In this way nurses contribute to the increased the number of organs transplanted per donor (6,16). In the current literature, there are studies that draw attention to the importance of nurses' knowledge and attitude about organ donation in increasing the donor ratio (6,19-23). However, studies on this topic in Turkey are limited (2) and the sample sizes of those studies are small. Therefore, this study aimed to provide data which that would shed light on ICU nurses' active role in organ donation by determining their knowledge and attitudes about organ donation in Turkey.

Research Questions

The ICU nurses'

- What is attitude about organ donation?
- What is the level of organ donation knowledge?
- Do sociodemographic characteristics have an effect on the organ donation attitudes?
- Do clinical characteristics have an effect on the organ donation attitudes?
- Do clinical and sociodemographic characteristics have an effect on the knowledge about organ donation?
- Is there a correlation between the organ donation attitude score and knowledge scores?

Methods

Design

This is a cross-sectional and descriptive study.

Study Settings

This study was conducted in the hospitals located in European sides of İstanbul in the north-western Turkey. In the period of

the study (June 2018-February 2020), there were 125 university hospitals in İstanbul. In most of these hospitals especially in private hospitals, there were no ICUs or there were a few beds. Therefore, the universe of the study consisted of 1,623 nurses working in ICUs of 14 hospitals which had quality certificate, and employing 30 or more ICU nurses. The hospitals where the study was conducted were hospitals with a university mission: state university hospital of the Higher Education Institution, private and public university hospitals of the Ministry of Health (education and research hospitals of the Ministry of Health).

Organ transplantations are performed in these hospitals with III level ICUs. Nurses working in these units encounter more organ donation cases. The knowledge and attitudes of these nurses on organ donation can provide important data for donor care nursing. That's why this study was performed especially on these nurses.

The selection criteria for hospitals was the existence of a level 3 ICU, working in an adult ICU for at least one year, voluntarily participating in the study, and speaking Turkish. Paediatric ICUs were not included in this study. In order to determine the organ donation attitude of a nurse working for organ donation in the paediatric ICU, it was necessary to reach nurses working longer. This did not meet the sample selection criteria.

Exclusion criteria from the sample: personal or family history of organ transplantation, incomplete filling of the data form.

Dependent variables were organ donation attitude and organ donation knowledge. Independent variables were age, gender, marital status, educational status, having an organ donation card, characteristics of hospital and ICU and intensive care experience.

Participants

The sample was created by considering the number of working nurses in the state university hospital, public university hospital, and private university hospital sectors. Weights of the stratum of the university hospitals were 0.18, 0.62 and 0.21, respectly. The number of volunteer nurses to be reached in each hospital was calculated.

The size of the sample was calculated with n=Nt2pq/d2(N – 1) + t2pq (t=1.96, d=0.05, p=50%, q=1-p) formula and it was aimed to reach 311 ICU nurses. It was necessary to reach 143 nurses from the state university hospital, 58 nurses from the private university hospital and 110 nurses from the public university hospital.

In the research, targeted number of nurses (n=311) was reached in 18 months (June 2018-February 2020).

Data Collection

The researchers interviewed the nurses face-to-face. They explained them the purpose of the research and introduced the data forms. The researchers asked the nurses to fill in the data forms. The data forms of these nurses were given to the manager nurses in a closed envelope. Manager nurses gave the forms to these nurses and asked them to fill in. The nurses handed the envelopes closed to the delivery manager nurses. The researcher received the data forms from the manager nurse.

Study Instruments-Validity and Reliability

Researchers used two scales in the study. The first of these scales was developed by Parisi and Katz (24) in 1986. The scale is the organ donation attitude scale (ODAS) adapted by Kent and Owens (20) in 1995. The validity and reliability study for revised the scale was conducted by Yazici Sayin (25) in 2016 in Turkey. The revised ODAS includes 46 items (23 positive, 23 negative items) which indicate attitudes about organ donation. Each item of the scale is in a 6-point Likert scale format, ranging between *completely agree and completely disagree.*

Researchers presented the Turkish scale within a questionnaire form. The first part of this form contains socio-demographic data. In the second part, there are 40 items (20 positive, 20 negative items) which determine the organ donation attitude. The revised ODAS subscale "philanthropy and moral values and beliefs" [positive attitudes about organ donation: (PAOD)] consists of 20 items (*for example: A person willing to donate is almost a hero, People have a moral responsibility to donate some of their body parts to people in need, By agreeing to donate my organs after death, I am giving some people hope for survival, Organ donation benefits the whole of philanthropy,….*). The score that can be obtained from PAOD is between 20 and 120 points. Negative attitudes about organ donation (NAOD) include 2 subscales. The first of these subscales is "fear of medical negligence" (FMN) (*for example: Organ donors cannot control which organs will be taken even when specified in advance, Medical school researchers who remove organs do not treat the body in a dignified manner, A person will be less likely to receive adequate medical care after signing a donor card,…*). The second is "fear of bodily injury" (FBI) (for example: Organ donation leaves the body disfigured, an intact body is needed for the next life ...). The FMN is about lack of knowledge of health services and distrust of health workers. The FBI is about religious beliefs, attitudes, and values. The FMN and FBI sections include 10 questions each and their scores vary between 10 and 60 points. The total NAOD score ranges between 20 and 120 points. High-positive and low-negative scores indicate strong voluntary attitudes about organ donation. The questions in this part are not mandatory to determine the participants' attitude. However, researchers can add their own questions here. The Cronbach's α was 0.85 for PAOD (Cronbach's α =0.92) and Cronbach's α was 0.91 for NAOD (20). In the present study, the Cronbach's α values were 0.94, 0.97 and 0.85, respectively for ODAS, PAOD and NAOD, respectively.

The second scale used in the study was the "organ donation information (ODI) scale" for the participants. This scale was developed by Emiral et al. (26) through a review of national and international literature and contemporary educational content. It includes a total of 17 questions which consist of correct and incorrect answers (9 correct, 8 incorrect). The questions consist of two subgroups. The first subgroup involves donor characteristics (age, definition of organ donation, cadaveric and live donor type, brain death and medical death, recipient and donor characteristics), while the second subgroup involves ethical, legal and medical conditions (permission from the patient and their

family for organ donation...). Score distribution is between 0 and 17 points. An increasing score means the level of knowledge is evaluated as positive, and a decreasing score connotes negative evaluation. The Cronbach's α was 0.88 (22). In the present study, the Cronbach's α for ODI was 0.69.

Statistical Analysis

We performed the data analysis using the SPSS 24.0 package software. We performed the Kolmogorow-Smirnow test to follow data distribution of the data. The data often did not demonstrate a normal distribution. Researchers conducted nonparametric statistical analyses for the study sample. For continuous variables, researchers expressed the data as mean ± standard deviation (SD), median, and range (minimum-maximum). Researchers used proportions for categorical variables. Researchers evaluated the results at a 95% confidence interval, and the significance at the $p<0.05$.

Ethics

This study respected the principles of research and publication ethics. Researchers obtained approvals from the Bezmialem Vakıf University Clinical Research Ethics Committee, under the code IRB#04.07.2017-12/192. Researchers took written permissions from the Provincial Directorate of Health, hospitals and volunteers for the research. Researchers informed ICU nurses that the information which they shared for this research was only intended for scientific purposes. Written permission was obtained from the authors who developed the ODAS and ODI for this study.

Results

Table 1 shows ICU nurses' sociodemographic characteristics. Of all the ICU nurses including in the study, 86.5% were between the ages of 20-34, 13.5% were older than 34, the mean age was 27.28±6.08 (min-max: 20-55) years, 77.2% were women, 59.5% had bachelor's degree, 46.0% were working in public/university hospital, 35.4% were working in private university hospitals, 18.6% were working in the state university hospital, 34.1% were in anaesthesia reanimation and postoperative care units. Of the nurses, 65.9% had 1-3 years and 8.7% had 11 years or more of ICU experience [mean ± SD (min-max)] 4.59±3.32 (1-20). Most of nurses (98.4%) did not have a donor card.

Table 2 shows the nurses' knowledge and attitude regarding organ donation according to the sociodemographic characteristics.

Based on the nurses' age groups, the PAOD score was statistically higher in nurses older than 34 years compared to those under the age of 34 years (95.95±24.58, 85.72±29.99; p=0.012). The nurses who held master's/doctorate and bachelor degree had higher PAOD and ODI scores compared to those with high school and associate degrees (91.49±28.43, 87.86±30.17; p=0.002, 14.49±1.69, 13.47±2.01; p=0.001). NAOD scores were low for all nurses. But the negative attitude scores were higher in nurses who held bachelor' and master's/doctorate degrees, compared to those with high school and associate degree graduates (57.71±20.98, 52.01±17.99; p=0.023). This difference was correlated with concerns of both bodily injury and medical negligence (26.58±10.54, 25.25±9.64; p=0.040, 28.50±12.14, 26.76±10.13; p=0.038).

Table 3 shows the nurses' knowledge and attitude regarding organ donation according to the clinic characteristics. Only the PAOD and ODI scores of the nurses working in a state university hospital were significantly higher than that of those working in a private and public university hospitals (95.07±25.32, 85.05±28.01, 81.81±31.83; p=0.007). The PAOD (67.97±28.11; p=0.001)

Table 1. Sociodemographic characteristics of intensive care unit nurses (n=311)

Age (years)	Number	%
(Mean ± SD) (min-max): 27.28±6.08 (20-55)		
20-34	269	86.5
35 and +	42	13.5
Gender		
Male	270	77.2
Female	71	22.8
Marital status		
Married	100	32.2
Single	211	67.8
Education		
High school graduate	68	21,9
Associate degree	22	7.1
Bachelor degree	185	59,5
Master/doctorate	36	11,6
University hospitals		
State*	58	18.6
Public	143	46.0
Private	110	35.4
Intensive care unit		
ARU/PCU	106	34.1
CVS and coronary	95	30.5
General adult	75	24.1
Neurosurgery/neurology, emergency	35	11.3
ICU experience (years)**		
(Mean ± SD) (min-max): (4.59±3.32) (1-20)		
1-3	205	65.9
4-10	79	25.4
11 and +	27	8.7
Organ donor card		
Yes	5	1.6
No	306	98.4
Which organ donation type the nurses supported		
Cadaveric	252	81.0
Living donor	59	19.0

*All the participants hold bachelor, master's or doctorate degree
**63.7% of nurses were working in a state university hospital for more than 4 years.
ARU: Anaesthesia reanimation unit, PCU: Postoperative care units, CVS: Cardiovascular surgery, SD: Standart deviation, min: Minimum, max: Maximum

and the NAOD (47.25±12.99, p=0.010) scores of the nurses working in neurosurgery/neurology and emergency were lower than the nurses working in the other ICUs. These differences were statistically significant. The PAOD and NAOD scores of the nurses did not show a statistical difference according to the years of work in the ICU (p>0.05).

In the present study, the nurses' PAOD scores (87.10±24.49), (philanthropy and moral values and beliefs) were higher than their NAOD scores (53.99±19.24) (Table 2). The correlation between PAOD and NAOD was negative (r=-0.124; p=0.029). The relationship between PAOD and ODI was positive, but not statistically significant (r=0.099; p=0.080). The relationship between NAOD and ODI was negative but not statistically significant (r=-0.101; p=0.060). However, the relationship between FBI and ODI was negative and statistically significant (r=-0.112; p=0.049) (Table 4).

Discussion

Our study shows that ICU nurses need in-service training for their attitudes about organ donation.

Sociodemographic Characteristics

The present study showed that hospitals in the metropolitan city of İstanbul worked with ICU nurses who were young and single, had bachelor's degree, worked in a public hospital, and had little working experience. Nurses may encounter with brain death cases, as they mostly work in critical areas such as anaesthesia-reanimation and postoperative, CVS/coronary, and general adult ICUs. Although Karaman and Akyolcu (11) did not only take university hospitals into account, they showed that ICU nurses had similar demographics (age, gender, educational level, institution where they work) in Istanbul in Turkey. In their study, even 23.3% of ICU nurses who worked less than 1 year were reported to have experience in cases of brain death and 53.1% faced the decision to transplant organs (11). According to the present study and the data collected by Karaman and Akyolcu (11) about 6 years ago, the fact that most ICU nurses did not increase their working time showed that nurse stability could not be achieved in ICU hospitals in İstanbul. This is noteworthy for the future of organ donation roles of ICU nurses and requires precautions.

The Attitude and Knowledge on Organ Donation

Some studies have shown that nurses' organ donation knowledge and attitudes may be related to sociodemographic (7,27) and clinical characteristics (28). In a study conducted in Tabriz, Shahsavarinia et al. (29) reported that age, gender, marital status and the characteristics of ICU had no effect on nurses' organ donation attitudes. In the present study, as the education level of the nurses increased, the PAOD ve ODI scores increased, and the NAOD score (fear of medical neglect and FBI) decreased. As the age of the nurses increased, the PAOD and NAOD (fear of medical neglect and FBI) scores increased, and the ODI score decreased. These findings suggest that nurses may have concerns about organ donation even if they have positive attitudes as their knowledge about organ donation decreases. It could be concluded that the positive attitudes of the male nurses in the study about organ donation were higher than that of the female nurses, but their ODI score was lower than that of the female nurses, which might be related to their education or working time and experience in this field. This situation can be explained

Table 2. The knowledge and attitude about organ donation according to the sociodemographic characteristics of the nurses (n=311)

Characteristics	PAOD	NAOD	FMN	FBI	ODI
	Mean ± SD (min-max)	Mean ± SD (min-max)	Mean ± SD (min-max)	Mean ± SD (min-max)	Mean ± SD (min-max)
Age*					
20-34	85.72±29.99 (27-120)	53.98±19.28 (22-117)	26.18±10.09 (10-58)	27.79±10.91 (10-59)	14.14±1.87 (7-20)
35 years old and over	95.95±24.588 (26-120)	54.04±19.24 (25-97)	26.02±10.32 (13-47)	28.02±11.13 (10-54)	13.57±2.36 (6-17)
Test & p	-2.510; 0.012	-0.129; 0.891	-1.293; 0.195	-0.397; 0.690	-1.367; 0.171
Gender*					
Female	85.18±30.15 (26-120)	54.45±19.33 (22-117)	26.58±10.05 (10-58)	27.86±10.76 (10-59)	14.08±1.96 (8-20)
Male	93.59±26.35 (27-120)	52.46±19.00 (25-106)	24.76±10.24 (11-54)	27.70±11.53 (12-54)	13.98±1.90 (6-16)
Test & p	-1.966; 0.049	-0.703; 0.481	-1.529; 0.121	-0.487; 0.623	0.563; 0.577
Education*					
High school and associate degree	87.86±30.17 (26-120)	57.71±20.98 (24-117)	26.58±10.54 (12-58)	28.50±12.14 (10-59)	13.47±2.011 (6-16)
Bachelor's and master's/ doctorate degree	91.49±28.43 (35-120)	52.01±17.99 (22-109)	25.25±9.6 (10-54)	26.76±10.13 (10-56)	14.49±1.69 (9-20)
Test & p	-3.114; 0.002	-2.279; 0.023	-2.053; 0.040	-2.072; 0.038	-5.715; 0.001
Total	87.10±29.49 (26-120)	53.99±19.24 (22-117)	26. 16±10.11 (10-58)	27.82±10.92 (10-59)	14.06±1.95 (6-20)

*Mann-Whitney U Test, PAOD: Positive attitudes towards organ donation, NAOD: Negative attitudes towards organ donation, FBI: Fear of bodily injury, FMN: Fear of medical negligence, ODI: Organ donation information, ICU: Intensive care unit

by the duration of experience with age. In addition, it is known that nurses with a high level of education are generally employed in critical ICU (such as Cardiovascular surgery and coronary ICU and postoperative ICU). Therefore, nurses with higher education may have worked more with organ donation patients. Although it was not statistically significant, the PAOD score (philanthropy and moral values and beliefs) of male nurses was higher than that of female nurses. The higher ODI score of male nurses may have played a role in this result.

The years of work in ICU of the nurses had no effect on the organ donation attitude. This can be explained by the fact that nurses are young and have less ICU experience. It was observed that the institution where the nurses worked and the characteristics (neurosurgery and postoperative ICU, cardiovascular ICU…) of the ICU affected the organ donation attitudes of the nurses. At this point, the facts that state university hospitals generally include a wider variety of patient characteristics, employ nurses with higher education levels and more frequently organize in-service training, congresses and symposiums can rather positively influence the perspective on organ donation. Findings demonstrate that nurses working in these hospitals are better suited to assume leading roles in terms of organ donation.

Table 3. The knowledge and attitude about organ donation according to the clinical characteristics of the nurses (n=311)

Characteristics	PAOD Mean ± SD (min-max)	NAOD Mean ± SD (min-max)	FMN Mean ± SD (min-max)	FBI Mean ± SD (min-max)	ODI Mean ± SD (min-max)
Institution of work*					
Training and research hospital	81.81±31.83 (27-120)	55.23±19.85 (23-117)	26.72±10.30 (10-58)	28.51±11.45 (10-59)	14.48±1.78 (8-20)
Private university hospital	85.05±28.01 (26-120)	53.48±20.43 (25-109)	26.08±10.64 (11-53)	27.39±11.35 (10-56)	13.52±1.88 (8-16)
Public university hospital	95.07±25.32 (36-120)	52.66±17.82 (22-11)	25.49±9.61 (12-56)	27.17±9.99 (10-55)	14.48±1.78 (8-20)
Test & p	9.843; **0.007**	0.886; 0.644	0.535; 0.768	1.107; 0.586	11.84**; 0.003**
ICU*					
ARU and PCU	88.30±31.09 (26-120)	58.08±19.68 (22-109)	28.24±10.44 (12-54)	29.83±11.14 (10-59)	13.93±2.08 (6-17)
CVS and coroner	91.25±27.09 (35-120)	52.02±18.81 (25-109)	24.61±9.63 (11-54)	27.41±10.99 (10-56)	14.14±1.68 (8-17)
General adult intensive care	89.09±27.85 (38-120)	53.86±20.58 (23.117)	26.56±10.69 (10-58)	27.30±11.75 (10-59)	14.24±1.94 (8-20)
Neurosurgery/ neurology, emergency	67.97±28.11 (38-116)	47.25±12.99 (29-99)	23.25±7.78 (13-48)	24.00±6.37 (11-44)	13.86±2.25 (7-17)
Test & p	**16.677; 0.001****	**11.287; 0.010**	**9.774; 0.021**	7.499; 0.058	0.513; 0.911
ICU working duration*					
1-3 years	87.10±30.11 (27-120)	53.51±19.49 (22-117)	25.94±10.22 (10-58)	27.57±11.09 (10-59)	14.05±1.93 (6-20)
4-10 years	85.70±29.12 (36-120)	54.60±18.93 (24-104)	26.51±9.67 (13-54)	28.08±10.91 (11-59)	14.15±2.13 (8-17)
10+	91.22±26.33 (26-120)	55.85±18.73 (32-91)	26.81±10.79 (13-47)	29.03±9.83 (17-54)	13.89±1.55 (10-16)
Test & p	0.985; 0.611	0.561; 0.753	0.383; 0.823	0.803; 0.665	2.424; 0.293
Total	87.10±29.49 (26-120)	53.99±19.24 (22-117)	26.16±10.11 (10-58)	27.82±10.92 (10-59)	14.06±1.95 (6-20)

*Kruskal-Wallis test, PAOD: Positive attitudes towards organ donation, NAOD: Negative attitudes towards organ donation, FBI: Fear of bodily injury, FMN: Fear of medical negligence, ODI: Organ donation information, ICU: Intensive care unit, ARU: Anaesthesia reanimation unit, PCU: Postoperative care units, CVS: Cardiovascular surgery, min: Minimum, max: Maximum

Table 4. The relationship between the knowledge and attitudes of intensive care nurses about organ donation (N=311)

Characteristics	PAOD **r and p value**	NAOD **r and p value**	FMN **r and p value**	FBI **r and p value**	ODI **r and p value**
PAOD	-	-0.124; **0.029**	-0.149; **0.008**	-0.130; **0.022**	0.099; 0.080
NAOD	0.124; **0.029**	-	-	-	-0.106; 0.060
FMN	-0.149; **0.008**	-	-	0.571; 0.001	-0.100; 0.070
FBI	-0.130; **0.022**	-	0.571; **0.001**	-	-0.112; **0.049**

ICU: Intensive care unit, PAOD: Positive attitudes towards organ donation, NAOD: Negative attitudes towards organ donation, FMN: Fear of medical negligence, FBI: Fear of bodily injury, ODI: Organ donation information, r: Spearman's rho

Although Turkey is the country to perform the highest number of organ transplants in the world according to the IRODaT 2020 report (18), it also ranks last in terms of cadaveric donors. In the present study, ICU nurses support cadaveric donation as a donor type. However, almost all of the nurses did not have an organ donation card. Most of them were young, they might fear medical neglect, their FBI might prevent them from donating their organs. Knowledge and attitudes of healthcare professionals impact to willingness to donate organs (4,6,12,21,27). In Turkey, where there is a general voluntariness in terms of becoming live donors for relatives (9), education and training regarding organ donation must start during nursing education years. The positive attitude score of the nurses was higher than negative attitude score, and there was an inverse relationship between knowledge and negative attitude. Although these data indicated that nurses had positive thoughts about organ donation, they had some fears. Nurses might have a fear of medical neglect, and it might be difficult for them to express this fear. Nurses' fear of medical neglect can be explained by lack of knowledge. FBI may be related to both religious beliefs and attitudes and lack of knowledge. Also, some nurses may have encountered some malpractice events in ICU.

The organ donation knowledge alone not be sufficient to create positive attitudes. Planned, repetitive training sessions rich in content (brain death, donor management, transplantation, communication, religious myths) increase ICU nurses' advocacy for organ donation and their commitment to the process, for improving their behaviours (7,28,29). Lomero et al. (30) and Foong et al. (27) reported that the attitudes of nurses/ICU nurses, who were not sufficiently convinced of brain death, were also negative. For example, it has been reported that ICU nurses who are aware of the organ donation legislation in the country have more positive attitudes independent of their own values and beliefs (27,30).

The ODI scores of the nurses in this study were not low. In addition, the ODI scores of the young and university graduate nurses were higher (although not statistically significant) than the others. However, this score was not high enough for an ICU nurse to be a consultant on organ donation. Nurses are expected to know death, grief counselling, hospital policies and procedures, brain death criteria, organ and tissue healing processes very well (22,30).

Today, the curricula in most nursing education institutions include certain content regarding organ transplant, but few provide instructions regarding the consent process and the role of the nurse (31-34). For critical care nurses in the field, continuing education is needed to enhance skills, knowledge, and sensitivity to organ donation (6,33-35).

Study Limitations

There were two limitations in the research. The first limitation was that bureaucratically process required to collect data took very long time (12 months), wasting time with corporate correspondence. The second limitation was that the data network being irregularly distributed in Istanbul, a very large city, and because of financial constraints, no interviewer assistance, other than that of the researcher's own efforts, could be used for data collection. This led to hospitals with level 2 intensive care processes being left out of the scope of the study. The lack of access to nurses working in these institutions limited generalization of study findings. However, since researchers had to make a selection, researchers chose to prioritize the attitudes and knowledge of the level 3 ICU nurses who assumed more critical roles and responsibilities in terms of organ donation, and attitude about organ donation. The reason being, the findings with these nurses can shed a light on other nurses' situation regarding the subject matter. However, the results should be limited to the study group.

Relevance to Clinical Practice

The findings drew attention to the relationship between the attitudes and information of intensive care nurses about organ donation and clinical characteristics. Also, data have shown that there is a need for comprehensive knowledge of the transplantation process. The study suggests that younger nurses need comprehensive training (brain death, transplantation and legislation, families, grief counselling, patients and community awareness) and clinical experience, through a perspective which fits their generational life views. Thus, they can be motivated for more active roles in Organ Donation Associations and Centres.

Conclusion

According to study data, the ICU nurse profile in the university hospitals in Istanbul is of young age, which leads to a short ICU clinical experience. Nurses' sociodemographic (age, education) and clinic characteristics (Institution of work, ICU; anaesthesia reanimation unit, postoperative care units) may be affect their PAOD and ODI scores. Researchers can say that nurses with higher education degrees and working in state/puplic university hospitals may specifically assume more active roles in terms of organ donation. Although it is recommended that nurses with a high level of education work in this field for their level of knowledge on organ donation, this is not enough. Continuous training of nurses on this subject is required after graduation. Nurses in Turkey need comprehensive professional training on brain death, organ donation process, grief counselling and organ donation legislation. To maintain duty continuity of ICU nurses is of utmost importance for organ donation roles and attitudes. It is recommended to further the subject in future with new studies.

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Ethics

Ethics Committee Approval: This study respected the principles of research and publication ethics. Researchers obtained approvals from the Bezmialem Vakıf University Clinical Research Ethics Committee, under the code IRB#04.07.2017-12/192.

Informed Consent: Researchers took written permissions from the Provincial Directorate of Health, hospitals and volunteers for the research. Researchers informed ICU nurses that the information which they shared for this research was only intended for scientific purposes. Written permission was obtained from the authors who developed the ODAS and ODI for this study.

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Authorship Contributions

Surgical and Medical Practices: Y.S., M.D., S.Y., Concept: Y.S., M.D., S.Y., Design: Y.S., M.D., S.Y., Data Collection or Processing: Y.S., M.D., S.Y., Analysis or Interpretation: Y.S., S.Y., Literature Search: Y.S., M.D., S.Y., Writing: Y.S., S.Y.

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