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Araştırma Makalesi
(Research Article)

Examination of Nursing Students' Knowledge And Attitudes Towards Organ Donation: A Cross-Sectional Study

Hemşirelik Öğrencilerinin Organ Bağışına Yönelik Bilgi Ve Tutumlarının İncelenmesi: Kesitsel Bir Çalışma

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Anahtar Sözcükler:
Organ bağışı, tutum, bilgi, öğrenci hemşire.

ABSTRACT

Objective: Nursing students, who will play a significant role in the healthcare team, need to have the necessary knowledge and a positive attitude towards organ donation to increase the number of organ donations. Because nurses have the power to improve society's perception of organ donation, which could have a positive impact on thousands of lives. Purpose of this study examining the knowledge and attitudes of nursing students regarding organ donation.
Methods: This descriptive and cross-sectional study was conducted at the Faculty of Nursing at a university in western Turkey. The study sample comprised 416 nursing students who volunteered to participate and were enrolled in the 1st through 4th years. The study utilized the students' sociodemographic and descriptive characteristics form, Organ-Tissue Donation And Transplantation Knowledge Scale, and Organ Donation Attitude Scale. The study data was gathered via Google Forms.
Results: In this study, it can be said that nursing students' knowledge about organ donation and transplantation is at an intermediate level and their attitudes towards organ donation are positive. It was determined that as the knowledge of nursing students about organ donation increased, their positive attitudes increased, and their negative attitudes decreased.
Conclusions: As a result of the study, it was found that increasing knowledge about organ donation increased the positive attitude towards organ donation and decreased the negative attitude. It is recommended that an effective education program should be established to increase the knowledge and attitudes of nursing students towards organ donation.

ÖZ

Amaç: Organ bağışı sayısını artırmak için sağlık ekibinde önemli bir rol oynayacak olan hemşirelik öğrencilerinin organ bağışına yönelik yeterli bilgiye ve olumlu tutuma sahip olmaları gerekmektedir. Çünkü hemşireler, toplumun organ bağışı algısını iyileştirme gücüne sahiptir ve bu da binlerce yaşam üzerinde olumlu bir etki yaratabilir. Bu çalışmanın amacı hemşirelik öğrencilerinin organ bağışına ilişkin bilgi ve tutumlarını incelenmesidir.
Yöntem: Tanımlayıcı ve kesitsel tipteki bu çalışma, Türkiye'nin batısındaki bir üniversitenin Hemşirelik Fakültesi'nde yürütüldü. Çalışmanın örneklemini, çalışmaya katılmaya gönüllü olan ve 1. sınıftan 4. sınıfa kadar öğrenim gören 416 hemşirelik öğrencisi oluşturdu. Çalışmada öğrencilerin sosyodemografik ve tanıtıcı özellikleri formu, Organ-Doku Bağışı Ve Transplantasyon Bilgi Ölçeği ve Organ Bağışı Tutum Ölçeği kullanıldı. Çalışma verileri Google Formlar aracılığıyla toplandı.
Bulgular: Bu çalışmada hemşirelik öğrencilerinin organ bağışı ve nakli konusundaki bilgilerinin orta düzeyde olduğu ve organ bağışına yönelik tutumlarının olumlu olduğu söylenebilir. Hemşirelik öğrencilerinin organ bağışı konusundaki bilgileri arttıkça olumlu tutumlarının arttığı, olumsuz tutumlarının ise azaldığı belirlenmiştir.
Sonuç: Çalışma sonucunda organ bağışı konusunda bilgi düzeyinin artmasının organ bağışına yönelik olumlu tutumu artırdığı, olumsuz tutumu ise azalttığı tespit edilmiştir. Hemşirelik öğrencilerinin organ bağışına yönelik bilgi ve tutumlarını arttırmak için etkili bir eğitim programı oluşturulması önerilmektedir.

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INTRODUCTION

Organ transplantation (OT) is the most effective treatment for people with end-stage organ or tissue failure. OT is one of the greatest achievements of the twentieth century and has prolonged and improved the lives of many people worldwide (The Declaration of Istanbul, 2008). However, due to the increasing number of people waiting for OT and the lack of sufficient OD, these people cannot receive adequate organ transplants (Gruessner and Gruessner, 2018). Over time, thanks to advances in science, technology, immunology, and surgery, there has been success and an increase in the number of OT. However, insufficient organ donation (OD) continues to be a major problem in OT (Nordham and Ninokawa, 2022).

The reasons for inadequate OD include variable clinical and legal definitions of brain death, inconsistency of brain death criteria, racial, ethnic, and religious perspectives on OD, misunderstanding and misrecognition of the donation process after cardiac death, ambivalence, inadequate OD control, and the consequent risk of organ trafficking. To overcome the inadequacies in OD, it is recommended to provide economic support to donors to increase the number of living and marginal donors and to ensure that the whole society has the idea that cadaveric organs are an indispensable source of health, and that OD means sharing health with everyone. In this direction, providing sufficient information and a positive attitude towards OD plays an important role in OD rates (Contiero and Wilson, 2019).

To increase OD, every society needs to have sufficient knowledge and positive attitudes. Health professionals in the community are the key to increasing OD rates and facilitating this process. Especially nurses, who have an important place among health professionals, and nursing students, who will have an important place after graduation, are expected to have sufficient knowledge and positive attitudes towards OD. Nurses' gaining sufficient knowledge and positive attitudes towards OD will contribute to supporting individuals and families towards OD. Nursing students, who are the professionals of the future, have a great influence on the opinion of their environment on OD and OT. Any negative attitude of this group of future health professionals may prevent the increase in OD (Marvan, Orihuela-Cortes and del Rio, 2020). This study aimed at examining the knowledge and attitudes of nursing students regarding OD.

Research Questions

1. What is the organ-tissue donation and transplantation knowledge of nursing students?
2. What is the OD attitude of nursing students?
3. Is there a relationship between OD knowledge and attitude in nursing students?

METHODS

Research Design

This study is a descriptive and cross-sectional study conducted at the faculty of nursing of a university during the spring semester of the 2021-2022 academic year, in western Türkiye.

Sample and Setting

The study required a sample size of at least 285 students from a population of 1100, with a 5% margin of error and a 95% confidence level. The study sample comprised 416 nursing students who volunteered to participate and were enrolled in the 1st to 4th years. The final sample exceeded the minimum required size calculated using the sample size calculation method for a known population, thereby increasing the statistical power of the study.

Data Collection

Data were collected using the ‘Students' Information Form’, the ‘Organ-Tissue Donation and Transplantation Knowledge Scale (OTDTKS)’, and the ‘Organ Donation Attitude Scale (ODAS)’ during the spring semester of the 2021-2022 academic year.

Students’ information form

Form was prepared by the researchers as a result of a review of the literature (Yazici Sayin, 2015; Ozturk Emiral, Isiktekin Atalay, Altunok, Gokler, Onsuz and Metintas, 2017; Sayin and Dagci, 2022) with the aim of

questioning of the students, obtaining an OD card and whether they received information about OD. Form consists of a total of 5 questions, 1 open-ended and 3 multiple-choice questions.

Organ-tissue donation and transplantation knowledge scale

The scale was developed in Turkish by Ozturk Emiral et al. in 2017, and its validity and reliability were also established. The difficulty index and discrimination index of the overall scale were 22.41% to 54.07% and 0.23 to 0.46, respectively. Retest reliability scores were significant (r: 1⁄4 0.87, p <.001). It is stated that the OTDTKS has sufficient reliability and validity to assess the knowledge of Turkish adults about organ tissue donation and transplantation. The scale consists of two sub-dimensions, "donor characteristics" and "legal, ethical, and medical procedures related to organ donation and transplantation," and a total of 17 items. Each correct answer on the scale is scored 1 point. Incorrect items are reverse scored. The lowest total score obtained from the scale is 0, and the highest total score is 17. The lowest score obtained from the "Donor Characteristics" sub-dimension is 0 and the highest score is 5, and the lowest score obtained from the "Legal, Ethical, and Medical Procedures Regarding Organ Donation and Transplantation" sub-dimension is 0 and the highest score is 12. The Turkish version of OTDTKS shows good validity, as the Cronbach's alpha value is more than 0.85 (0.88) (Ozturk Emiral et al., 2017). In this study, the Cronbach's alpha value of the scale was 0.81.

Organ donation attitude scale

Parisi and Katz developed scale in 1986, and Kent and Owens revised it in 1995. Yazici Sayin conducted the Turkish validity and reliability study of the ODAS in 2015. The Turkish version of the scale consists of a total of 40 items: 20 positive and 20 negative items related to OD attitude. The items on the scale are scored on a 6-point Likert scale (6: completely agree; 1: strongly disagree). There are three sections of the ODAS:
a. The first section includes items that determine attitudes towards OD, and this section consists of two dimensions. The first dimension consists of positive statements and shows people's benevolence and moral values and beliefs about OD. This dimension was measured with 20 positive items. The possible score in the dimension of "benevolence and moral values and beliefs" varies between 20 and 120. The second dimension consists of two negative sub-dimensions: "fear of medical neglect" and "fear of bodily injury." The score that can be obtained from the perceived "fear of being medically neglected" sub-dimension varies between 10 and 60, and the score that can be obtained from the "fear of bodily injury" sub-dimension varies between 10 and 60. The score that can be obtained from total negative statements varies between 20 and 120. High positive and low negative scores indicate that voluntary attitudes towards OD are strong. The Cronbach's alpha value of the "positive attitude/helpfulness and moral values/beliefs" dimension of this scale was 0.925, the Cronbach's alpha value of the "negative attitude/fear of medical neglect" sub-dimension was 0.869, and the Cronbach's alpha value of the "negative attitude/fear of bodily injury" sub-dimension was 0.883 (Yazici Sayin, 2015). In this study, the Cronbach's alpha value of the "positive attitude/helpfulness and moral values/beliefs" dimension of the scale was 0.92, the Cronbach's alpha value of the "negative attitude/fear of medical neglect" sub-dimension was 0.94, and the Cronbach's alpha value of the "negative attitude/fear of bodily injury" sub-dimension was 0.93.
b. Two additional sections were included in the ODAS. The second section contains items concerning the socio-demographic characteristics of the participants.
c. The third section contains information about the advantages of donated organs and volunteering for OD (Yazici Sayin, 2015). An effective educational program should be implemented to enhance the knowledge and attitudes of nursing students regarding OD.

The research data were gathered from students who volunteered between February-June 2022 using Google Forms in a single session.

Ethical Considerations

The ethical approval of the study was obtained from the Medical Research Ethics Committee of University (No: 978, Date: May 27, 2021). Permission to use the scales in the study was obtained from the authors via e-mail. The names and other information of the participants were kept confidential during and after the study. Written informed consent was obtained from each individual participating in the study under the responsibility of the investigator after the aims, methods, objectives and potential hazards of the study were explained. The study was conducted in accordance with the principles of the Declaration of Helsinki.

Data Analysis

The research data were statistically evaluated using the SPSS Statistics for Windows, Version 25.0 IBM program. Descriptive statistics (mean, median, standard deviation, percentage, and frequency) were used to analyze the data. The normality assumption of the data was checked by the Shapiro-Wilk test. An independent sample t test and a one-way analysis of variance (ANOVA) were used for normally distributed variables. The Kruskal-Wallis test was used for variables that did not show a normal distribution. Pearson correlation analysis was used to determine the relationship between two variables. A value of $p<0.05$ was considered statistically significant for all results.

RESULTS

The study's response rate is 37.81%. The mean age of 416 students in the study was 21.41+1.643 years, and 78.8% of the students were female. It was determined that 34.4% of the students were 2nd year students, 59.4% had received information about OT and OD before, and 91.1% had not been personally or professionally involved in any OD before. The data collection tool below provides the results.

Organ and Tissue Donation and Transplantation Knowledge of Nursing Students

The mean total score of the OTDTKS was 12.37±3.42 points; the mean donor characteristics sub-dimension score was 3.43±0.96; and the mean legal, ethical, and medical procedures related to organ donation and transplantation sub-dimension score was 8.94±2.29 points (Table 1).

Table1. Mean Scores of Nursing Students' ODAS, OTDTKS, and Scale Sub-dimensions

Scales and sub-dimensions	Mean+SD (min-max)
ODAS	
Sub-dimension 1(positive attitude)	
Benevolence and moral values/beliefs	102.57±16 (20-120)
ODAS	
Sub-dimension 2 (negative attitude)	56.38±28.21 (20-120)
Fear of being medically neglected	26.99±14.86 (10-60)
Fear of bodily injury	29.39±14.31 (10-60)
OTDTKS	
Donor characteristics	12.37±3.42 (0-17)
Legal, ethical and medical procedures related to organ donation and transplantation	3.43±0.96 (0-5) 8.94±2.29 (0-12)

Note: SD: Standard Deviation, ODAS: Organ donation attitude scale, OTDTKS: Organ-tissue donation and transplantation knowledge scale

The mean total score of the OTDTKS was found to be statistically significantly higher among female nursing students ($t = 4.492$, $p = 0.000$) and among those who had received information about organ transplantation and donation ($t = 3.165$, $p = 0.02$). Similarly, the mean scores of the donor characteristics sub-dimension were significantly higher in female students ($t = 2.829$, $p = 0.000$) and in those who had received information on organ donation and transplantation ($t = 2.110$, $p = 0.036$). In addition, the mean scores of the legal, ethical, and medical processes related to organ donation and transplantation sub-dimensions were found to be significantly higher among female students ($t = 4.471$, $p = 0.000$) and among those who had received relevant information ($t = 3.065$, $p = 0.002$) (Table 2).

Attitudes of Nursing Students Toward Organ Donation

The mean total score of the positive attitudes that constitute the first dimension of the ODAS of nursing students is 102.57±16 points. The mean total score of the negative attitudes forming the second dimension of the scale is 56.38±28.21 points. The total mean scores of the sub-dimensions of the second dimension, fear of medical neglect and fear of bodily injury, were 26.99±14.86 points and 26.99±14.31 points, respectively (Table 1).
The mean total score of positive attitudes (t: 2.002, p: 0.046) was higher, while the mean total score of negative attitude (t: -7.451, p: 0.000), the mean total score of fear of medical neglect (t: -6.759, p: 0.000), and fear of bodily

injury (t: -6.298, p: 0.000) were lower in female nursing students. The 2nd year nursing students had a higher mean score (t: -2.497, p: 0.013) in the ODAS negative attitude fear of being medically neglected. The mean total score of positive attitude (t: 3.374, p: 0.001), the mean total score of negative attitude (t: -2.497, p: 0.013), and the mean total score of fear of being medically neglected (t: -2.497, p: 0.013) of the ODAS were found to be higher in nursing students who had previously received information about OT and OD (Table 2).

Relationship Between Knowledge of Organ and Tissue Donation and Attitudes Toward Organ Donation

There was a statistically significant (r = 0.148, p = 0.003) positive correlation between the mean total score of OTDTKS and the positive attitude (r = 0.148, p = 0.003) and negative attitude (r = -0.425, p = 0.000), negative attitude fear of medical neglect (r = -0.430, p = 0.000), and negative attitude fear of bodily injury (r = -0.425, p = 0.000) sub-dimensions of the ODAS of nursing students.
On the ODAS, there was a statistically significant positive correlation between nursing students' positive attitudes and their negative attitudes about organ-tissue donation and transplantation knowledge (r: -0.455, p: 0.000). This was also true for the donor characteristics sub-dimension of the attitude scale of OD. A statistically significant negative correlation was found between negative attitude (r = -0.147, p = 0.003), negative attitude fear of medical neglect (r = -0.138, p = 0.005), negative attitude fear of bodily injury (r = -0.146, p = 0.003), and the donor characteristics sub-dimension of OTDTKS. At the same time, a statistically significant negative correlation was found between the negative attitude (r: -0.455, p: 0.000), negative attitude fear of medical neglect (r: -0.463, p: 0.000), and negative attitude fear of bodily injury (r: -0.415, p: 0.000) sub-dimensions of ODAS and the legal, ethical, and medical procedures related to organ donation and transplantation sub-dimensions of OTDTKS (Table 3).

There was a statistically significant (r: 0.148, p: 0.003) positive correlation between the mean total score of OTDTKS and the positive attitude (r: 0.148, p: 0.003) and negative attitude (r: -0.425, p: 0.000), negative attitude fear of medical neglect (r: -0.430, p: 0.000), negative attitude fear of bodily injury (r: -0.425, p: 0.000) sub-dimensions of the ODAS.

Table 2. Distribution of Nursing Students' ODAS, OTDTKS and Sub-dimensions According to Sociodemographic and Descriptive Characteristics

Sociodemographic and Descriptive Characteristics	ODAS Positive Attitude/ Charity and moral values/ Beliefs	ODAS Negative Attitude	ODAS Negative Attitude/ Fear of being medically neglected	ODAS Negative Attitude / Fear of bodily injury	OTDTKS	OTDTKS Donor characteristics	OTDTKS Legal, ethical, medical process related to organ donation and transplantation
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Sex							
Female	**103.38±15.425**	**51.36±25.448**	**24.32±13.342**	**27.04±13.155**	**12.83±3.002**	**3.51±0.857**	**9.32±2.585**
Male	**99.55±17.752**	**75.09±30.237**	**36.92±16.060**	**38.17±15.115**	**10.65±4.289**	**3.11±1.245**	**7.53±3.500**
Test Value/p	**t=2.002/p=0.046**	**t=-7.451/p=0.000**	**t=-6.759/p=0.000**	**t=-6.298/p=0.000**	**t=4.492/p=0.000**	**t=2.829/p=0.006**	**t=4.471/p=0.000**
Year of course							
First	**102.35±18.215**	51.92±26.170	**24.68±13.680**	27.25±13.415	12.50±3.324	3.39±0.992	9.11±2.715
Second	**100.13±17.544**	59.54±29.045	**29.38±15.276**	30.15±14.384	11.97±3.735	3.34±0.993	8.63±3.155
Third	**102.30±12.362**	60.05±27.993	**28.10±14.909**	31.95±14.420	12.27±3.415	3.43±1.034	8.84±2.835
Fourth	**107.49±11.434**	53.48±29.044	**24.90±15.160**	28.58±15.072	13.01±2.936	3.64±0.767	9.38±2.678
Test Value/p	**KW=11.631/p=0.009**	F=2.296/p=0.077	**F=2.872/p=0.036**	F=1.929/p=0.124	F=1.689/p=0.169	F=1.751/p=0.156	F=1.314/p=0.269
Previous information about organ transplantation and donation							
Yes							
No	**104.86±13.379**	**53.54±27.685**	**25.29±14.503**	28.26±14.245	**12.82±3.09**	**3.51±0.845**	**9.31±2.687**
Test Value/p	**99.21±18.741**	**60.53±28.549**	**29.47±15.070**	31.06±14.300	**11.71±3.785**	**3.30±1.106**	**8.41±3.100**
	t=3.374/p=0.001	**t=-2.497/p=0.013**	**t=-2.846/p=0.005**	t=-1.969/p=0.050	**t=3.165/p=0.02**	**t=2.110/p=0.036**	**t=3.065/p=0.002**

Note: SD: Standard deviation, t: Independent Sample T test, F: ANOVA, KW: Kruskal-Wallis test, significant at p<0.05, Correlated factors are indicated in bold, ODAS: Organ donation attitude scale, OTDTKS: Organ-tissue donation and transplantation knowledge scale .

A statistically significant positive correlation was found between the positive attitude (r: -0.455, p: 0.000) of the ODAS and the negative attitude OTDTKS donor characteristics sub-dimension (r: -0.455, p: 0.000) of the nursing students. A statistically significant negative correlation was found between negative attitude (r: -0.147, p: 0.003), negative attitude fear of medical neglect (r: -0.138, p: 0.005), negative attitude fear of bodily injury (r: -0.146, p: 0.003) and donor characteristics sub-dimension of OTDTKS. At the same time, a statistically significant negative correlation was found between the negative attitude (r: -0.455, p: 0.000), negative attitude fear of medical neglect (r: -0.463, p: 0.000), negative attitude fear of bodily injury (r: -0.415, p: 0.000) sub-dimension of ODAS and the legal, ethical and medical procedures related to organ donation and transplantation sub-dimension of OTDTKS (Table 3).

Table 3. The Relationship Between the Mean Scores of OTDTKS and ODAS

Scales and sub-dimensions	ODAS/ Positive attitude	ODAS/ Negative attitude	ODAS/ Negative attitude/ Fear of being medically neglected sub-dimension	ODAS/ Negative attitude / Fear of bodily injury sub-dimension
OTDTKS	**r: 0.148 p: 0.003***	**r: -0.425 p: 0.000***	**r=-0.430 p=0.000***	**r=-0.392 p=0.000***
OTDTKS/ Donor characteristics sub-dimension	**r=0.239 p=0.000***	**r=-0.147 p=0.003***	**r=-0.138 r=0.005***	**r=-0.146 p=0.003***
OTDTKS/ Legal, ethical and medical procedures regarding organ donation and transplantation sub-dimension	r=0.096 p=0.051	**r=-0.455 p=0.000***	**r=-0.463 p=0.000***	**r=-0.415 p=0.000***

Note: r: Pearson correlation coefficient: *significant at p<0.05, ODAS: Organ donation attitude scale, OTDTKS: Organ-tissu donation and transplantation knowledge scale

Benefits of Donated Organs and Voluntariness of OD

It was found that 11.3% of the nursing students had an OD card, and 60.1% of them were planning to obtain an OD card. It was found that 59.4% of the students had received information about OT and OD before, but only 8.9% of them had been personally or professionally involved in any OD before. It was found that 56.5% of the students knew that there is an organ donor registration system in Turkey, but 82.2% did not know how this system works or what it does, and 69.4% had no opinion about supporting a change in the system in Turkey regarding OD. It was determined that 44.0% of the students did not have any organs that they did not plan to donate. 71.2% of the students would accept the transplantation of another person's organ to stay alive, 70.2% would accept the organ of a member of the opposite sex, 47.4% would accept an organ from an animal, 67.8% would accept an artificial organ such as a machine, 86.1% would accept receiving blood from someone else, 33.9% stated that they would be willing to give an organ to someone in need if the surviving members of their family were paid a good fee, and 61.6% stated that in order for the organs of the organ donor to be harvested, the consent of the donor or his/her family must be obtained from an official health institution such as a hospital or emergency service before death. These students' 80.0% stated that they wanted their bodies to be buried when they died (Table 4).

Table 4. Nursing Students' Findings on the Benefit Status of Donated Organs and the Voluntariness of Organ Donation

Variable	Number (n)	Percent (%)
Do you have an organ donor card?		
Yes	47	11.3
No	369	88.7
Do you plan to get an organ donor card?		
Yes	250	60.1
No	166	39.9
Have you received information about organ transplantation and donation before?		
Yes	247	59.4
No	169	40.6
Previous personal or professional involvement in any organ donation		
Yes (personal)	26	6.3
Yes (professional)	11	2.6
No	379	91.1
Do you know that there is an 'Organ Donor Registration System in Turkey'?		
Yes	235	56.5
No	181	43.5
'Do you know how the Organ Donor Registration System in Turkey works/what it does?		
Yes	74	17.8
No	342	82.2
Would you support a change in the system of organ donation in Turkey?		
Yes I would support	118	28.4
No I would not support	9	2.2

No Opinion	289	69.5
What are the organs you would never consider donating?		
There is no organ I don't want to donate	183	44.0
Other	80	19.2
I don't want to donate any of my organs	75	18.0
Genitals and face, eyes and skin	41	9.9
Face	19	4.6
Face, eyes and skin	18	4.3
Would you agree to have someone else's organs transplanted into your body?		
Yes		
No	296	71.2
Possible	15	3.6
	105	25.2
Would you accept an organ of the opposite sex?		
Yes	292	70.2
No	16	3.8
Possible	108	26.0
Would you accept an organ from an animal?		
Yes	197	47.4
No	68	16.3
Possible	151	36.3
Would you accept a machine-like artificial organ?		
Yes	282	67.8
No	20	4.8
Possible	114	27.4
Would you agree to take blood from someone else?		
Yes	358	86.1
No	6	1.4
Possible	52	12.5
If the surviving members of your family were paid a good wage, would you be willing to give an organ to someone in need?		
Yes	141	33.9
No	143	34.4
Possible	132	31.7
Is it necessary to obtain the consent of the donor or his/her family from an official health institution such as a hospital or emergency room before the death of the donor in order to harvest his/her organs?		
Yes it is necessary	256	61.6
No need	42	10.1
No Opinion	118	28.4
What do you want done with your body when you die?		
Burial	333	80.0
To be donated for research	50	12.0
Undecided	14	3.4
Mummification	9	2.2
Freezing	5	1.2
Incineration	5	1.2
Total	416	100

DISCUSSION

In this study, the knowledge and attitudes of nursing students towards OD, their willingness to have an organ donor card, and their volunteering status were examined.

Knowledge on Organ-Tissue Donation and Transplantation

In this study, it can be said that nursing students' knowledge about OD and OT is at an intermediate level. In a study conducted in Korea, it was found that nursing students' knowledge about OD was not at an optimal level (Kim, Fisher and Elliott, 2006). In studies conducted in India (Ghose et al., 2021), Nepal (Limbu, Basnet and Silwal, 2019), and Saudi Arabia (Majeed, 2016), it was reported that nursing students' knowledge about OD was at a moderate level. In studies conducted in Mexico (Marvan et al., 2020), Rwanda (Uwingabiye, Baziga, Chironda and Rajeswaran, 2021), Italy (Zampieron, Corso and Frigo, 2010), Germany (Tackmann, Kurz and Dettmer, 2020), and Korea (Kim et al.), it was found that nursing students had insufficient knowledge or a lack of knowledge about

OD. In a study conducted in Turkey, it was found that nursing students lacked knowledge about OD (Goz, Goz and Erkan, 2006). In this study, it is seen that the knowledge of nursing students about OD is like the studies in the literature. Considering the above studies, it can be said that the knowledge of nursing students in different countries about OD is not at the expected level. At this point, universities have great responsibilities. Because it is stated that trainings on OD at universities significantly increase the knowledge and willingness of students (Akpinar Soylemez and Ordin 2017). In this direction, it is recommended that topics related to OD be included in the education programs of nursing students in a comprehensive manner. The inclusion of topics related to OD in nursing programs ensures that students have the right information, provides students with the opportunity to raise awareness of society and develop positive attitudes on this issue, and contributes to how students will play a role in patient care and education for OD. Thus, OD becomes widespread, and many people's lives can be saved.
The knowledge level of female students was found to be higher. It is also stated in the literature that women are numerically superior in living and cadaveric OD (Biller-Andorno, 2002; Boulware et al., 2002). In this direction, it can be said that women are more voluntary about OD, and this may affect their level of knowledge. At the same time, it was determined that students who received information about OD had higher knowledge about donor characteristics and the legal, ethical, and medical processes of OD. This situation reveals the importance of education again. Education provides accurate information, from OD volunteering to the medical process of OT, as well as competence in legal and ethical issues.

Attitudes Towards OD

In this study, it can be said that nursing students' attitudes towards OD are positive. In a study conducted in Korea, it was found that nursing students' attitudes towards OD were mixed and ambiguous but generally positive (Kim et al., 2006). When the literature was examined, it was reported that nursing students had positive attitudes towards OD in studies conducted in India (Ghose et al., 2021), Mexico (Marvan et al., 2020), Nepal (Limbu et al., 2019), Saudi Arabia (Majeed, 2016), Spain (Martinez-Alarcon et al., 2022), England (Cantwell and Clifford, 2000), Germany (Tackmann et al., 2020), Albania (Ruta et al., 2022), and Turkey (Akpinar Soylemez and Ordin, 2017). As a result of the above studies, it is seen that nursing students in different countries have similar and positive attitudes towards OD. In this direction, although factors such as ethnic, social, cultural structure, and religious beliefs are effective in influencing attitudes towards OD (Demirkiran, Bozbay, Elmaagac and Agkoc, 2020), it is seen that nursing students in different geographical regions exhibit similar and positive attitudes towards OD. The nursing profession places a high value on professional ethical values, nursing education programs are based on certain standards, and universities use similar programs, which all help to explain this. At the same time, with the globalizing world, barriers to information access are removed, cultural interactions are experienced, health policies are shared, and international cooperation is provided.

Although nursing students exhibit positive attitudes towards OD, the situation to be considered here is the transformation of attitude into behavior. Although positive attitudes have a great impact on individuals' intentions to donate organs (Ju, Sim and Son, 2018), willingness to donate or positive attitudes do not necessarily mean that they will become donors (Marvan et al., 2020). It is also stated that attitudes towards OD often do not translate into behaviors (Mohs and Hubner, 2013). In order to increase nursing students' positive attitudes towards OD and to transform these attitudes into behaviors, it is recommended to determine their information needs and eliminate their deficiencies, to plan awareness-raising trainings and activities, to add comprehensive content on OD to education programs, to explain the view of religion on OD, especially in religious societies, to discuss the views of the individual and family on OD before death, to share clinical experiences, to mentor clinical or academic nurses and to be role models.

In this study, it was found that nursing students who had previously received information about OD and who were of female gender had higher positive attitudes. It is an expected finding that students who have received information about OD before having higher positive attitudes. The fact that women have better communication and empathy skills can account for the higher positive attitudes toward OD among women. However, on the contrary, OD should not differ according to gender (Mohs and Hubner, 2013). At the same time, in this study, the fear of being medically neglected, which is a sub-dimension of the negative attitude towards OD, was found to be higher in 2nd-year nursing students. This is a surprising finding. This may be explained by the fact that in the education program of the faculty where the study was conducted, the courses related to pathologies started in the 2nd year, and therefore 2nd year students were new to diseases, had just started taking courses on organ failure and donation, had insufficient clinical experience, and still needed training. On the other hand, upperclassmen have more clinical experience and communication with patients and are one step closer to professional identity and professional responsibilities compared to 2nd year students. It is thought that this situation may also affect the perspective on OD.

Knowledge and Attitudes Towards Organ Tissue Donation and Transplantation

In this study, it was found that there was a positive relationship between nursing students' level of knowledge and positive attitudes towards OD. In other words, it was determined that as nursing students' knowledge about OD increased, their positive attitudes increased, and their negative attitudes decreased. In previous studies, it was reported that there was a positive relationship between the level of knowledge and positive attitudes towards OD (Poreddi, Katyayani, Gandhi, Thimmaiah, Badamath, 2016; Ju et al., 2018) and a negative relationship between the level of knowledge and negative attitudes (Marvan et al., 2020). It is evident that the findings of the study are like those in the literature.

OD Volunteerism of Nursing Students

In this study, only 11.3% of nursing students were found to be organ donors. When the literature was examined, it was reported that 40.6% of nursing students in Hong Kong (Tam, Suen and Chan, 2012), 16% in Italy (Zampieron et al., 2010), 74% in England (Cantwell and Clifford, 2000), and 3.6% in Greece (Symvoulakis et al., 2014) were organ donors. In studies conducted in Turkey, the rates of nursing students being organ donors are reported to be 2.5%, 6%, and 12%, respectively (Sayin and Dagci, 2022; Goz et al., 2006; Cebeci, Sucu Dag and Karazeybek, 2015). The status of nursing students as organ donors differs according to countries. It is expected that the status of being an organ donor will differ between continents and countries and even between regions within the country (Tsubaki, Tougo, Kobayashi, Arakawa and Yoshida, 2020). Although there has been a "Law on Organ and Tissue Harvesting, Storage, Vaccination, and Transplantation" in Turkey since 1979, most of the Turkish people adopt the religion of Islam, and the Presidency of Religious Affairs states that Islam encourages OD, and there is sufficient OD infrastructure such as the "National Organ and Tissue Transplantation Coordination System" and "Turkey Organ Donor Registration System." It is seen that the rate of nursing students becoming organ donors is low. This situation can be explained by the insufficiency of education, awareness-raising, and awareness-raising.

CONCLUSION

The study assessed nursing students' knowledge and attitudes towards OD, revealing that their knowledge was moderate, and their attitudes were positive. This study revealed that awareness of OD led to more favorable attitudes. Enhancing the knowledge and fostering positive attitudes of nursing students towards OD is believed to boost the overall rate of OD in society. It is advised to plan activities to raise awareness among nursing students, identify educational needs, review educational programs, and ensure that all relevant information about OD is incorporated into the program. Theoretical knowledge should be integrated with clinical experiences through conducting case studies, sharing real-life stories, and providing guidance and support to students. Thus, OD becomes widespread, and many people's lives can be saved.

LIMITATION

The study was done in one faculty at a university, so the results cannot be generalized. Since nursing students participated voluntarily, it is thought that there is a lack of potential opinions not included in the sample. Another limitation of this study is the relatively low response rate, which may limit the representativeness of the sample.

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