

# The Effect of Nursing Education on the Opinion of Students Regarding Organ Donation

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## Abstract

**Objectives:** The purpose of this study was to examine the effects of nursing education on the opinion of students regarding organ donation and to offer suggestions according to the outcomes.

**Methods:** The study design was a descriptive study. The sample of this study consisted of 743 voluntary grade 1 and 4 students in nursing schools of 5 universities, and 47.4% were grade 1 students and 53.6% were grade 4 students. The data were obtained via a questionnaire that had been prepared by the researchers in reference to the literature and based on expert opinion. The data obtained were evaluated electronically by descriptive statistics and a chi-square test.

**Results:** It was determined that 82% of the students were willing to donate their organs. The leading causes for unwillingness to donate organs included preference to maintain body integrity, concerns about organ trafficking and the notion that the decision about their death would be rendered earlier because of organ removal. It was determined that the knowledge and sources of information of students regarding organ donation significantly increased in the course of nursing education ( $p=0.000$ ).

**Conclusion:** Nursing education positively affects the opinions of students regarding organ donation. The positive attitudes of the nurses of the future, who have an important role in public education, will positively affect their approach toward the patient with brain death, as well as the decision process of families for organ donation, and consequently may increase the rate of organ donation.

## Introduction

Organ/tissue transplantation is a transplantation process in which a non-functioning organ or a tissue is replaced with a healthy organ or tissue removed from a living donor or a deceased person [1,2]. Besides being a successful treatment method for the patients with irreversible failure of a vital organ and giving diseased patients a second chance at life [3,4], organ transplantation also provides patients having end-stage organ failure with an opportunity to improve their quality of life [2,5,6]. Nowadays, it is possible to transplant a number of vital organs and tissues including the heart, lungs, liver, kidneys, pancreas, small intestines, bone marrow, blood, skin, and corneas [4]. Organ transplantation is one of the leading important health problems in Turkey, as it is worldwide. The number of patients waiting for organ transplantation has been progressively increasing. Despite the considerable developments in organ transplantation, one of the most important stages of organ transplantation is the procurement of the organ that is to be transplanted [1,7,8].

In organ transplantation, the source (donor) can either be a living person or cadaver (deceased donor). The most suitable donor for organ transplantation is a relatively young and healthy donor with irreversible brain death and with functional organs other than the brain [8,9]. In Western countries, organs are mainly procured from cadavers (3,4), whereas in Turkey, the organs are mainly procured from living donors, particularly by donation from the relatives of the patient [2,10]. Inadequate organ donation is a common problem in our country, as it is worldwide [1].

Organ and tissue transplantation in Turkey is regulated by "The Law about Organ and Tissue Procurement, Preservation, Grafting and Transplantation", Law No. 2238, and "Regulation concerning Organ and Tissue Transplantation Services, which came into effect on 01 June 2000 after being promulgated in the Official Journal, No. 24066, and by the directives pursuant to this regulation. Within the framework of the Law No. 2238, it is declared that the brain death of

a patient must be diagnosed by a committee of 4 doctors comprising a cardiologist, a neurologist, a neurosurgeon and an anesthesiology and reanimation specialist. It is also stated in Clause 14 of the relevant law that, in order for a person with brain death to become a donor, the person must have declared his/her willingness to donate organs in his/her life and the consent of the relatives must be obtained, otherwise he/she indicated his/her willingness to donate organs officially or with a written will [11]. Thus, it is important to ensure that the families should understand brain death to give consent [9].

At the beginning of 2000s, "National Organ and Tissue Transplantation Coordination System" was established under the control and coordination of the Ministry of Health, in order to enhance the efficacy of the works on organ and tissue transplantation in Turkey. The goal of the system is to ensure country-wide coordination between the institutions and organizations working on organ and tissue transplantation services, to enhance the efficacy, to increase the supply of cadaver organs, and to ensure fair allocation of the organs and tissues in conformity with the scientific rules and medical ethics. The data regarding organ donation and transplantation in 2002 and at the end of 2007 was compared, it was observed that the number of annually reported brain deaths increased from 139 to 594, the number of cadaver donors increased from 111 to 223, the number of kidney transplantations from cadaver increased from 189 to 399, the number of liver transplantations increased from 82 to 197, and the number of heart transplantations increased from 20 to 63 [11].

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Although the sale of an organ has been prohibited with international regulations, the ethical, social, and economic conditions of the populations play a determinative role on this issue. In some communities, the religious and especially cultural approaches do not let the integrity of the corpse to be violated; thus, organ donation is not adequate [10]. The Presidency of Higher Committee of Religious Affairs indicated by the promulgation No.396/13 on 06 March 1980 that organ donation is religiously permissible if certain conditions are fulfilled, and declared that there are verses in the Qur'an on this issue, and emphasized that no price should be paid for organ or tissue that will be transplanted. In addition, the institution has conducted activities in the mosques in order to encourage willingness for organ donation [12].

Nurses play a significant role in the identification of the donors [13,14]. As the attitudes and willingness of the health professionals toward organ donation substantially affect their approach to the patient with brain death, as well as the decision process of the patient's family for organ donation [5,15], sensitive, responsive, and supportive attitudes of nurses encourages the family regarding organ donation [10,16]. The previous studies has indicated that the persons' point of view for organ donation is influenced by many factors such as the person's knowledge and opinions on the matter, education level, socio-cultural factors, religious beliefs [6,17] and that education for organ donation is shown to encourage willingness [18-20]. This descriptive study was conducted to determine the effect of nursing education on the opinion of the nurses of the future, who will play an important role in encouraging people for organ donation, and to provide suggestions in accordance with the study results.

## Materials and Methods

The present study was conducted as a descriptive study to determine the effect of nursing education on the opinion of the students regarding organ donation. The study population consisted of 743 voluntary grade 1 and 4 students in nursing schools of 5 universities in Istanbul. The data were obtained via a questionnaire that had been prepared by the researchers in reference with the literature and based on expert opinion. The students were asked to complete the questionnaire form in the classroom. The questionnaire consisted of 43 questions, including 6 questions pertaining to socio-demographic characteristics, whereas the other questions involved the opinions of students concerning organ donation. Statistical analyses were performed using Statistical Program for Social Sciences for Windows (SPSS, Inc Chicago, IL, USA) version 21. The data were analyzed by descriptive statistics and by a chi-square test. A p value <0.05 was considered statistically significant.

## Results

The mean age of the students who participated in the study (n=743) was 21±1.8 years; 47.4% were grade 1 students, and 52.6% were grade 4 students. Of the students, 21.9% had a driver's license; 30.7% of those with a driver's license (n=163) had been questioned about their willingness to donate organs at the time they obtained the driver's license.

The answers provided by the students for the questions that were asked to determine their knowledge and experiences regarding organ donation were compared according to their grades. When the opinion of students regarding organ donation were compared according to their grades, no significant difference was found between the grade 1 and 4 students with respect to the following opinions: 1) organ

donation is life-saving, 2) having adequate knowledge about organ donation, 3) the information about organ donation within the context of nursing education is adequate, and 4) being responsible for increasing the rate of organ donation as a student at nursing school (p>0.05, Table 1).

Opinions regarding organ donation	Grade 1 students	Grade 4 students	Statistical evaluation	
	N (%)	N (%)	$\chi^2$	p
Organ donation is life-saving				
Yes	336 (47)	379 (53)	1.270	0.264
No	3 (50)	3(50)		
Uncertain	13 (59)	9 (41)		
Having adequate knowledge about organ donation				
Yes	27 (30)	64 (70)	23.758	0.801
No	210 (52)	170 (48)		
Partly	115 (42)	157 (58)		
The information about organ donation within the context of nursing education is adequate				
Yes	33 (40)	49 (60)	2.383	0.146
No	210 (47)	234 (53)		
Partly	109 (50)	108 (50)		
Being responsible for increasing the rate of organ donation as a student at nursing school				
Yes	245 (48)	269 (52)	0.056	0.813
No	107 (47)	122 (53)		
Knowledge about the time of removal of the organs				
After brain death	132 (49)	207 (51)	37.898	0.054
After cardiac death	117(67)	57 (33)		
Others (After brain and cardiac death)	103 (45)	127 (55)		
Discussing organ donation with family members				
Yes	168 (44)	215 (56)	3.909	0.048
No	184 (51)	176 (49)		

Table 1: Opinions and attitudes of students about organ donation (n=743).

The sources of information about organ donation and the results of the comparisons according to grades of the students are presented Table 2. Accordingly, when the students were compared based on their grades in terms of sources of information about organ donation, it was determined that there was a significant difference between the Grade 1 and 4 students with respect to obtaining information in the

course of nursing education, from the internet, and from health care workers, and family discussion about organ donation ( $p<0.05$ ), whereas no significant difference was found between the Grade 1 and 4 students with respect to obtaining information from TV/radio, newspapers/magazines/books/brochures, and family members/friends.

	Grade 1 students	Grade 4 students	Statistical evaluation	
	N (%)	N (%)	$\chi^2$	p
In the course of nursing education				
Yes	71 (28)	187 (72)	28.579	0.000
No	163 (49)	168 (51)		
Internet				
Yes	59 (34)	116 (66)	4.529	0.020
No	179 (43)	236 (57)		
Health care workers				
Yes	37 (34)	72 (66)	6.395	0.007
No	251 (47)	281 (53)		
TV-radio				
Yes	113 (42)	156 (58)	0.714	0.223
No	127 (39)	202 (61)		
Newspapers/magazines/books/brochures				
Yes	125 (39)	194 (61)	0.108	0.403
No	113 (41)	166 (59)		
Family members/friends				
Yes	47 (42)	65 (58)	0.727	0.227
No	244 (46)	282 (54)		

Table 2: The sources of information of students about organ donation\*.  
\*More than one item has been checked

The knowledge of the students about brain death and the results of the comparisons based on their grades are presented in Table 3. Accordingly, a statistically significant difference was observed between the students of different grades with respect to the definition of brain death, opinion that brain death is the death of a subject and/or is irreversible, and the approval of organ transplantation from a donor with brain death ( $p<0.001$ ). Among the students, 82% ( $n=611$ ) were willing to donate their organs, whereas 18% ( $n=132$ ) were unwilling to donate their organs.

The reasons that influence the decision of the students who want to donate their organs are presented in Figure 1. It was observed that the leading reason that influences a student's decision to donate organs was to help other people, followed by religious reasons and to make a contribution to the science. Of the 132 students who were unwilling to donate their organs, 44% ( $n=58$ ) were grade 1 students and 56% ( $n=74$ ) were grade 4 students.

The reasons for the students who were unwilling to donate their organs and the results of the comparisons based on their grades are presented in Table 4. As shown in Table 4, the leading reasons for unwillingness to donate organs (for the grade 1 and 4 students, respectively) were preference to maintain body integrity (42% and 34%), concerns about organ trafficking (31% and 27%), the notion

Information about brain death	Grade 1 students	Grade 4 students	Statistical evaluation	
	N (%)	N (%)	$\chi^2$	p
Has information about brain death been provided within the course of nursing education?				
Yes	69 (24)	221 (76)	122.799	0.000
No	156 (72)	59 (28)		
Partly	127 (53)	111 (47)		
Do you think that brain death is the death of a person/it is irreversible?				
Yes	146 (36)	262 (64)	49.024	0.000
No	113 (63)	67 (37)		
Uncertain	93 (60)	62 (40)		
Do you approve organ transplantation from a donor with brain death?				
Yes	145 (36)	252 (64)	40.270	0.000
No	87 (60)	58 (40)		
Uncertain	120 (60)	81 (40)		

Table 3: The knowledge of students regarding brain death.

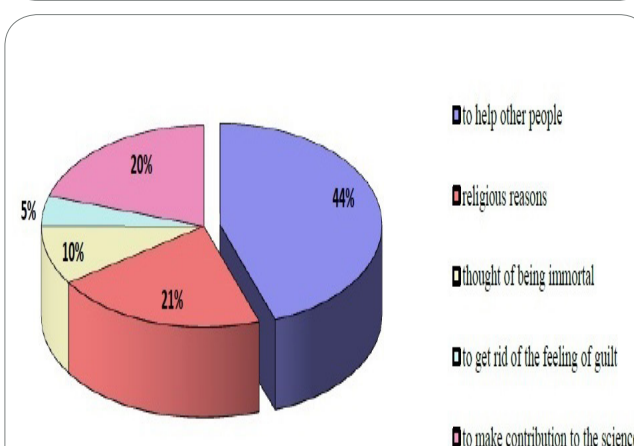


Figure 1: Reasons that influence the decision of students who were willing to donate their organs.

that the decision about their death would be rendered earlier because of organ removal (28% and 30%), religious reasons (26% and 26%), the opinion that the organ will not be transplanted and will be used for medical research (24% and 28%), the opinion that his/her burial may be delayed (27% and 23%), the opinion that an available recipient will not be found and the organ will be discarded (14% and 22%), unwillingness to think about death (17% and 17%), and the opinion that the body will be disfigured after removal of the organ (12% and 15%). The least likely reasons included opinion that there are few patients waiting for organ transplantation (5% and 10%) and the opinion that his/her organs will be transplanted to those that he/she does not want (10% and 5%). It was determined that there was no significant difference between the students of different grades regarding the reasons for unwillingness to donate organs ( $p>0.05$ ).

## Discussion

The present study was conducted to determine the effect of nursing education on the knowledge and opinions of grade 1 and 4 students regarding organ donation who were being educated in nursing school of 5 universities in Istanbul. The data of the present descriptive study

were obtained from 743 students. The mean age of the students was  $21 \pm 1.8$  years; 47.4% of whom were grade 1 students, and 52.6% were grade 4 students.

organ donation from?" were as follows: the internet, 59%; and a religious official, 61%. In the present study, the comparison of students according to their grades regarding the sources of information about

Reasons	It is of no importance	A little bit important	Moderately important	Somewhat important	Very important	Statistical evaluation	
	N (%)	N (%)	N (%)	N(%)	N (%)	$\chi^2$	p
Religious reasons							
Grade 1 students	12 (21)	10 (17)	10 (17)	11 (19)	15 (26)	0.546	0.708
Grade 4 students	12 (16)	13 (18)	15 (20)	15 (20)	19 (26)		
Unwillingness to think about death							
Grade 1 students	24 (41)	7 (12)	9 (16)	8 (14)	10 (17)	2.141	0.436
Grade 4 students	23 (31)	13 (18)	11 (15)	14 (19)	13 (17)		
The opinion that his/her organs will be transplanted to those that he/she does not want							
Grade 1 students	39 (67)	4 (7)	3 (5)	6 (10)	6 (10)	5.921	0.879
Grade 4 students	41 (55)	13 (18)	8 (11)	8 (11)	4 (5)		
The opinion that an available recipient will not be found and the organs will be discarded							
Grade 1 students	22 (38)	12 (20)	8 (14)	8 (14)	8 (14)	1.827	0.296
Grade 4 students	26 (35)	11 (15)	10 (13)	11 (15)	16 (22)		
The opinion that the organ will not be transplanted and may be used for medical research							
Grade 1 students	19 (33)	10 (17)	12 (21)	3 (5)	14 (24)	4.148	0.424
Grade 4 students	23 (31)	11 (15)	9 (12)	10 (14)	21 (28)		
The opinion that the body will be disfigured after removal of the organ							
Grade 1 students	25 (43)	12 (21)	5 (9)	9 (15)	7 (12)	3.904	0.759
Grade 4 students	28 (38)	16 (22)	13 (17)	6 (8)	11 (15)		
The notion that the decision about their death would be rendered earlier because of organ removal							
Grade 1 students	20 (34)	6 (10)	10 (17)	6 (10)	16 (28)	3.263	0.522
Grade 4 students	17 (23)	13 (17)	16 (22)	6 (8)	22 (30)		
Preference to maintain body integrity							
Grade 1 students	14 (24)	3 (5)	10 (17)	7 (12)	24 (42)	5.732	0.944
Grade 4 students	10 (14)	10 (14)	17 (23)	12 (16)	25 (34)		
Opinion that there are few patients waiting for organ transplantation							
Grade 1 students	33 (57)	10 (17)	11 (19)	1 (2)	3 (5)	7.720	0.089
Grade 4 students	32 (43)	18 (24)	9 (12)	8 (11)	7 (10)		
Concerns about organ trafficking							
Grade 1 students	17 (29)	10 (17)	6 (11)	7 (12)	18 (31)	5.663	0.576
Grade 4 students	15 (20)	10 (14)	19 (25)	10 (14)	20 (27)		
The opinion that his/her burial might be delayed							
Grade 1 students	22 (38)	5 (9)	7 (12)	8 (14)	16 (27)	3.232	0.942
Grade 4 students	22 (30)	13 (17)	12 (16)	10 (14)	17 (23)		

Table 4: Reasons for students who were unwilling to donate their organs (N=132).

In the majority of the studies, in which the sources of information about organ donation have been questioned, it was reported that the written and visual media (television, newspapers, and magazines, etc.) have made a substantial contribution to the knowledge of organ donation [8,21,22]. In their study Alleman et al. have reported that eye-pleasing brochures with accurate and understandable content attract the attention of people [23]. In the study conducted by Haustein and Sellers involving 185 patients, the rates of the answers that the patients provided to the question "where did you get the information about

organ donation revealed that the majority of students acquired information about organ donation in the course of nursing education (grade 1 students, 28%; grade 4 students, 72%;  $p < 0.001$ ) [24]. This result shows that the students have been informed adequately about organ donation in the course of nursing education. Moreover, a significant difference was determined in favor of the grade 4 students in terms of obtaining information from the internet and from health care workers ( $p < 0.05$ ). In the present study, the majority of the students (grade 1 students, 39%; grade 4 students, 61%) expressed



that they obtained information about organ donation via newspapers, magazines, books, and brochures. This indicated that the sources of information about organ donation were similar with those reported in the literature. According to these study outcomes, it can be concluded that the best ways to inform people about organ donation are the media and the internet. Manipulation of the population about organ donation accurately via the media, raising the awareness of the population via television programs supporting organ donation, and providing education on organ donation in the schools will substantially increase the rate of organ donation [24].

Brain death is the complete and irreversible loss of brain activities. It is impossible for a person diagnosed with brain death to come back to life [25,26]. In the study conducted by Kim et al. on nursing students in Korea, 64% of the students expressed that organ transplantation was convenient after brain death [27]. In the study conducted by Ohwaki et al. on medical students, the majority of the participants (71%) were in the opinion that the organs of a recipient with brain death can be transplanted [17]. In the present study, when the answers provided by the grade 1 and 4 students to the questions about brain death were compared, the level of knowledge regarding brain death was significantly more accurate among grade 4 students as compared to grade 1 students ( $p < 0.001$ ). In the present study, the high rate of students who reported to have adequate information about brain death may have been due to the enrollment of nursing students. Similarly, the approval of organ donation from a donor with brain death was highly significant in favor of grade 4 students. All of these outcomes were similar with those reported in the literature. Accordingly, these results suggest that the level of knowledge of students regarding brain death has significantly increased in the course of nursing education.

Organ donation gives patients with irreversible failure of vital organs a second chance at life [28,29]. Owing to the fact that the organs cannot be found in time, the great majority of awaiting recipients lose their lives [1,30]. In the study performed by Goz et al. on medical, nursing, dentistry, and health technical students, it was determined that 65.5% of the students were willing to donate their organs [31]. The rates of students willing to donate their organs were 69.2% in the study conducted by Dutra et al. on medical students [32]. It was also reported in the above-mentioned studies that the level of knowledge about organ donation increased as the years of education increased. In the study conducted by Kiberd on the grade 1 and 4 students in nursing education, the great majority of the students (89% and 94%, respectively) were reported to be willing to donate organs [13]. In a study conducted on university students in Italy, Canova et al. also determined that the majority of students (89.6%) approved of organ donation [33]. In the study by Kilic et al. conducted on university students, the majority of the students (91.1%) declared that they would donate their organs [34]. Consistent with the results of the above-mentioned studies, the great majority (82%,  $n=611$ ) of students in the present study also reported that they were willing to donate their organs. Furthermore, this result can be considered hopeful for the increase in the number of organ donations in the future.

When the studies that questioned the reasons for the willingness to donate organs was reviewed, it was found that the participants were willing to donate organs in order to supply the survival (40%) [35], to help patients (46.1%) [36], to serve humanity (82.2%) [4], and to give life to people (44.8%) [37]. In the present study, the leading reason for willingness of the students to donate their organs was to help other people (44%), whereas the second most common reason was religious (21%), and the third most common reason was to make a contribution

to science (20%); the results were in agreement with the literature [4,36,37].

A prior written consent of the donor is required for organ donation [25]. In Turkey, in law number 2238 it was stated that "in order that the organs and tissues of a person over the age of 18 years that reached the age of discretion can be donated, the donor should have given a consent, that is written and signed clearly, consciously and without being influenced in the presence of at least 2 persons or, a statement, that has been orally declared and signed in the presence of at least 2 witnesses, that should be approved by a doctor" [11]. Even though the subject has donated his/her organs in accordance with the law, the organ or the tissue can be removed with the consent of the first-degree relatives (although they have legally no right to refuse) who are present at the time of death [25,38]. When the publications about the reasons for unwillingness to donate organs have been reviewed; the majority of the university students in Italy (43.7%) participated in the study by Canova et al. were unwilling to donate their organs because of ethical reasons [33]; the participants who were included in the study by Al-Faqih mentioned that they would not be treated sufficiently when become a donor [39]. Moreover, Sanner reported that 39% of the participants in their study were in the opinion that their body would be disfigured after organ donation [40]. Bolukbas et al. reported that 44.8% of the participants in their study were unwilling to donate organs due to religious reasons [35], and Pierini et al. reported that 40.4% of the participants in their study were unwilling to donate organs because of fear and lack of confidence [37]. In the present study, 18% of the students were unwilling to donate their organs. The reasons for the unwillingness about organ donation for both classes (for the 1<sup>st</sup> and 4<sup>th</sup> classes, respectively) include the anxiety about organ trafficking (31% and 27%), the notion that the decision about their death would be rendered earlier because of organ removal (28% and 30%), and religious reasons (26% and 26%); the results were in agreement with the literature. Considering the reasons in the present study for the unwillingness to donate organs, it can be suggested that most of the reasons arise from lack of information. The religion of Islam approves of organ donation. In Turkey, the Presidency of Higher Committee of Religious Affairs has reported in its 396 numbered decision in 1980 that organ donation is religiously permissible [12]. It is considered that informing the nursing students with negative attitudes toward organ donation will increase the rate of organ donation, and that the nurses of the future who are students at present, will encourage the population for organ donation.

## Conclusion

The purpose of this study was to examine the effects of nursing education on the opinion of the nursing students. All these outcomes suggest that nursing education positively affects the opinion of the students regarding organ donation and changes their attitudes about organ donation. The positive attitudes of the nurses of futures, who play an important role in public education, about organ donation, will positively affect their approach to the patient with brain death and the decision process of the patient's family as well, and thus may increase the rate of organ donation.

## Competing Interests

The authors declare that they have no competing interests.

## Author contributions

All authors substantially contributed to the study design, collection and interpretation of data, and drafting the manuscript.

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