

# Emergency Medical Staffs' Knowledge and Attitude About Organ Donation After Cardiac Death

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## Research article

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## Abstract

**Background:** Adverse attitudes and insufficient knowledge about organ donation after cardiac death among emergency staffs can have important consequences for the proper identification of potential donors, constant application of donation after cardiac death policies, and the relative strength of support for this type of donation. Therefore, this study was conducted to investigate the awareness and attitude of emergency personnel about organ donation after cardiac death.

**Methods:** This descriptive study was carried out with the participation of 49 physicians and 145 nurses working in the emergency departments of educational and medical centers of Tabriz University of Medical Sciences. Nurses were selected by simple random sampling, and all physicians working in the emergency departments were included in the study. The questionnaire of Knowledge and Attitude regarding Organ Donation after Cardiac Death designed by Rodrigue et al. was used. Data were analyzed using descriptive statistics and independent samples t-test, one-way ANOVA, and chi-square test.

**Results:** Most of the nurses (62.8%) and physicians (66.7%) had high level of knowledge about organ donation after cardiac death. The mean attitude score was 101.84 (SD: 9.88) out of 170 for nurses and 106.53 (SD: 11.77) for physicians. Physicians who had organ donation card had a more positive attitude toward organ donation after cardiac death.

**Conclusion:** According to this study findings, knowledge and attitude of the emergency staffs about organ donation was high and positive. It is recommended to devise necessary guidelines for organ donation in Iranian emergency departments to help the personnel for introducing qualified people for organ donation or taking the necessary measures.

## Background

A shortage of organs for donation is a problem in all countries, including Iran. The latest statistics reveal that currently about 27000 people are on the waiting list for the transplant operations, with one being added to the list every 10 minutes. Every 12 hours a person receives a vital organ and returns to life, but 8 to 10 patients in need of organ transplant die per day because of a lack of organ donation.<sup>1,2</sup> Donation after cardiac death (DCD) is one of the ways used in recent years to provide an organ for transplantation from the patients who have severe musculoskeletal disease, spinal cord injury, or irreversible brain injury and who do not meet criteria for brain death.<sup>3</sup>

This type of organ donation has been introduced for increasing organs for transplantation, in which the individual becomes a candidate for organ donation of kidneys, liver and sometimes lungs 5 minutes after heartbeat and blood circulation stops permanently.<sup>4</sup> DCD is a proven way for multiple organ donation in a number of countries, including Australia.<sup>5</sup> Since 2010, many Australian hospitals have been introducing the DCD protocol to improve the process and goals of organ donation; a protocol in which

emergency physicians and nurses play an important role in identifying DCD cases. DCD has become an accepted medical practice in the past 15 years.<sup>6</sup>

In Iran, organ donation is from a person with brain death or a living person, and organ donation after cardiac death is not performed at any transplant center. Only in some centers, such as the transplant center of Shiraz University of Medical Sciences, there is a plan to perform a transplant from a cadaver. Therefore, there is no guideline and protocol for this type of organ donation and the personnel especially emergency staffs have not been trained in this regard.

Studies show that most emergency physicians and nurses are unaware of DCD protocols or procedures, and need training. Meanwhile, one of the major barriers to using DCD is the knowledge and readiness of emergency personnel to use it and to identify people who are eligible for DCD.<sup>5</sup> According to the Hosseini et al. study, organ donation success is closely related to the level of knowledge and attitude toward the organ donation process.<sup>7</sup> Some studies have shown that lack of knowledge about organ donation, especially among healthcare personnel, causes a loss of almost 20% of organs to be donated and organ transplants. Accordingly, the positive attitude of healthcare personnel about organ donation is the key to the donation process.<sup>8</sup>

Some studies revealed that nurses' and physicians' attitude about organ donation is associated with the success of organ donation programs, such that a positive attitude about organ donation in physicians and nurses indirectly increases consent to organ donation.<sup>9</sup> The lack of knowledge about donation, especially among healthcare providers about the legal details and organ donation procedures is a restricting factor.<sup>10</sup>

The emergency department (ED) has a critical place in the hospital, with its function as the heart of the hospital, its critical and unpredictable nature, and the need to perform a multiple of high quality, efficient, fast and complex processes.<sup>11,12</sup> ED has a high potential for introducing potential DCD cases from among those with sudden death at the accident scene or in the CPR room in ED, which makes it an appropriate place to activate and announce cardiac arrest deaths and to lead to the organ donation. It seems that the attitude and knowledge of the ED personnel, especially physicians, can have an effective role in guiding families to donate organs of the patients.<sup>13</sup>

Few studies have investigated the knowledge and attitude of the personnel regarding DCD, but none was conducted in Iran. Meanwhile, we need data on the knowledge and attitude of emergency nurses and physicians regarding DCD. Thus, this study aimed to assess the knowledge and attitude of nurses and physicians working in EDs affiliated with Tabriz University of Medical Sciences about DCD.

## Methods

### Study design and setting

This descriptive study was conducted after obtaining permission from the local Research Ethics Committee (IR.TBZMED.REC.1398.082) and the Deputy for Research and Technology of the university. The population of this study was nurses and physicians working in the emergency departments of educational and medical centers of Tabriz University of Medical Sciences. A total of 55 physicians and 240 nurses worked in ED. The Cochran formula was used to estimate the sample size. Considering  $p = 0.5$ ,  $q = 0.5$ , and  $d = 0.05$ , the estimated sample size was 49 for physicians and 147 for nurses, which was respectively raised to 54 and 162, considering a 10% attrition.

## **Selection of Participants**

For sampling, first the number of nurses worked at the selected departments was determined. Then, the names of eligible nurses were listed, and they were numbered. The final participants to be included in the study were randomly selected based on quota of each department. The selected nurses were invited for the study. The participants were first assessed in terms of basic information and eligibility criteria. If they were eligible for being included in the study, comprehensive information was provided for them about the aims of study and confidentiality. If they had willingness to participate in the research, informed consent form was filled out by participants and data collection tools were completed by participants. Of the 162 questionnaires delivered to the nurses, 145 were completed. All ED physicians were recruited to participate in the study, and 54 questionnaires were delivered, of which 49 were complete.

## **Measurements**

Three questionnaires were used in this study: a sociodemographic questionnaire, Knowledge and Attitude questionnaires. The sociodemographic characteristics of physicians and nurses were collected using a 13-item questionnaire for data about age, sex, marital status, education level, employment status, overall work experience and ED work experience, religion, ethnicity, specialty, familiarity with organ transplant, having an organ donation card and agreement with organ donation. To assess the knowledge and attitude of nurses and physicians about DCD, the Knowledge and Attitude Questionnaire developed by Rodrigue et al. (2018) was applied.<sup>14</sup>

The Knowledge questionnaire has 20 items to measure personnel knowledge about DCD through true/false options. The attitude questionnaire consists of 34 items, scored by a five-point Likert scale: strongly agree (score 1), agree (score 2), no comment (score 3), disagree (score 4), and strongly disagree (score 5). Twelve of the 34 questions of attitude were reversely scored. The total score of the questionnaire is between 34 and 170, with the highest score indicating a positive attitude toward organ donation. It should be explained that the option 'strongly agree' indicates low attitude and low score in total attitude scores except for the inverse questions.

The content validity of the questionnaire was verified through a survey of faculty members based on Waltz & Bausell methods to determine its content validity and Lawshe method was used to determine the content validity ratio. It was used to judge the experts on each item, using three spectrum '1 = item is required, 2 = item is useful but not required, 3 = item is not required'. Items with a content validity ratio of

more than 0.62 were considered important based on the Lasha table and the number of evaluators. A method effect was used to check the scores. The reliability of the questionnaire was investigated after collecting the data from 30 patients including 20 nurses and 10 physicians. The reliability of the attitude questionnaire was determined by internal consistency reliability method using Cronbach's alpha coefficient of 0.07. The reliability of Knowledge questionnaire was assessed using the Kuder Richardson 21 ( $R_z = 0.85$ ).

## **Analysis**

After data collection, mean and standard deviation were used for analyzing the symmetrical quantitative data, and the interquartile range and median were used for analyzing data with asymmetric distribution. Qualitative data analysis was also performed by mean and standard deviation. Shapiro-Wilk test was used to examine the normal distribution of attitude score and t-test or ANOVA was applied to compare attitude scores with sociodemographic characteristics. ANOVA was also used to compare attitudes between residents, nurses and emergency medicine specialists while the chi-square test was used to relate demographic characteristics with having organ donation cards, agreement with organ donation and family history of organ donation. Statistical analysis was performed in SPSS v24.

## **Results**

### **Characteristics of study subjects**

An analysis of sociodemographic characteristics of nurses and physicians (Emergency medicine specialists and residents) showed that the mean age of nurses was  $34.82 \pm 6.96$  years and the mean age of physicians was  $36.25 \pm 6.26$  years. The majority of nurses were female, i.e., 83 (57.2%) and the majority of physicians were male, i.e., 30 (61.2%). (Table 1)

### **Main results**

Regarding knowledge questions, 91 nurses (62.8%) and 30 physicians (66.7%) answered the questions correctly. The results show that the majority of nurses, i.e., 113 (77.9%) answered question "The determination of death can be made by the critical care physician, the transplant team, or the official representative of the organ procurement organization" incorrectly and 135 (93.1%) answered question "Only the kidneys and liver can be recovered and successfully transplanted" correctly. The majority of physicians, i.e., 41 (83.7%) answered question " Brain death criteria must also be fulfilled before organ recovery begins " incorrectly while 46 (93.9%) answered questions " Family members are allowed to be present at the time life support is withdrawn until death " and " Only the kidneys and liver can be recovered and successfully transplanted " correctly. (Table 2)

Regarding the attitude of nurses and physicians, the results showed that they had a relatively positive attitude toward DCD, as nurses' attitude score was  $101.9 \pm 84.88$  and physicians' attitude was  $106.53 \pm 11.77$  out of a maximum score of 170. The results showed that 26 nurses (17.9%) were

completely in agreement and 59 (40.7%) were in agreement with the question "I feel less comfortable with the death criteria for DCD than for brain death". Also, the majority of physicians agreed with question "I feel that the DCD donation process is "eerier" than the brain death donation process", i.e., 15 (30.6%) strongly agreed, and 17 (34.7%) agreed, indicating a low attitude of nurses and physicians to DCD. (Table 3)

One-way analysis of variance was used to compare the mean total scores of attitude among nurses, specialists and emergency medicine residents, indicating a statistically significant difference between the groups in terms of the attitude score  $F(2.191) = 4.512$ ,  $P=0.012$ . (Table 4) Meanwhile, Tukey's HSD test showed that the attitude score of emergency medicine specialists was significantly higher than that of other groups ( $P = 0.016$ ). A comparison of attitude scores with sociodemographic characteristics scores in different age groups, sex, service records, etc. revealed no statistically significant difference in the attitude score. ( $P > 0.05$ ).

Of the 194 physicians and nurses, 182 (93.8%) were in favor of organ donation, comprising 136 nurses (93.8%) and 46 physicians (93.9%), while 12 (6.2%) were against organ donation, comprising 9 nurses (6.2%) and 3 physicians (6.1%). Only 32 participants (16.5%) had an organ donation card, which included 15 nurses (10.3%) and 17 physicians (34.7%). As many as 191 participants (93.5%) did not have a family history of donation, comprising 143 nurses (98.6%) and 48 physicians (98.0%).

The relationship of the attitude of physicians and nurses with the following questions was examined: Do you agree with organ donation? Do you have a donation card? And do you have a family history of donation? It was revealed that physicians who had an organ donation card had a more positive attitude toward DCD and this relationship was statistically significant. However, there was no statistically significant relationship in the physician group concerning the question on agreement with DCD, having a family history of donation and attitude toward DCD. The results also showed that there was no statistically significant relationship between nurses' attitude and having a donation card, agreement with DCD and having a family history of donation. ( $p \geq 0.05$ ).

The results of the relationship between the nurses' sociodemographic characteristics with questions about agreement with DCD, having an organ donation card and having a family history of donation showed that ethnicity and gender had a significant relationship with the question of agreement with DCD and other sociodemographic characteristics, while they produced no statistically significant differences with sociodemographic characteristics.

The results of the relationship between sociodemographic characteristics of the physicians and questions on agreement with DCD, having an organ donation card, and family history of organ donation showed a significant relationship between marital status and agreement with DCD whereas other sociodemographic characteristics had no significant relationships.

## **Limitation**

The present study has several limitations. The main limitation of the study is that only the knowledge and attitude of nurses and physicians has been evaluated. However, in order to design such services, the views of health and medical managers, as well as the opinions of patients and their families, should be considered.

## Discussion

The results of the present study showed that knowledge of physicians and nurses about DCD was moderate to high. The personnel were well aware of the costs of organ donation and transplantation, family presence at the time of discontinuation of supportive treatments, the impact of the time elapsed since death on the outcome of organ transplantation, including their survival, which indicate their ability to identify and introduce eligible individuals for donation. However, they had less knowledge of the number of organs that can be removed/transplanted as they considered only the kidneys and liver.

The results of the study by D'Alessandro et al. (2008) showed that the level of personnel knowledge about DCD was low.<sup>13</sup> Likewise, Rodrigue et al. (2018) reported that only 18% of the personnel answered the questions related to the knowledge about DCD, indicating their low awareness.<sup>14</sup> A study by Burker et al. (2015) also showed that paramedics had less awareness of DCD, feeling they were inadequately skilled in the DCD process.<sup>15</sup> However, Beaulieu et al. showed that healthcare personnel such as nurses and physicians were well aware of organ donation.<sup>16</sup>

The results of the present study showed that physicians and nurses had a relatively positive attitude toward DCD, such that the reliability of the organ transplant department, and considering DCD a positive outcome of death received the highest attitude score. Meanwhile, less familiarity with criteria of DCD and the complexity of DCD process compared to organ donation after brain death had the lowest score of attitude. The study by Montero et al. showed that healthcare personnel in hospitals had a high attitude toward organ donation, which is consistent with our study.<sup>17</sup> Rodrigue et al.'s study also showed that ICU personnel had a positive attitude toward DCD.<sup>14</sup> Burker et al. findings also showed that paramedics had a positive attitude toward organ donation.<sup>15</sup> Marck et al. (2016) conducted a study on the attitude of emergency personnel toward cadaveric organ donation, and reported that the majority of them had a positive attitude toward organ donation. In the present study, emergency medicine specialists obtained a higher total score of attitude as compared with emergency medicine residents and nurses, which is consistent with the findings of Schaeffner et al.<sup>18,19</sup>

There was no statistically significant relationship between physicians' and nurses' attitude and any of the sociodemographic characteristics (gender, age, history of general and emergency services, religion, educational background, and employment status). Also, more than 90% of the participants agreed with organ donation but only 16.5% had an organ donation card and physicians who had an organ donation card had a more positive attitude toward DCD ( $P = 0.01$ ). Meanwhile, marital status was found to have a statistically significant relationship with agreement with organ donation. For nurses, there was a statistically significant relationship between agreement with organ donation and ethnicity and gender.

In a study by Banas et al.'s, 98% of the participants were in favor of donation, whereas 31.5% had an organ donation card and 49.5% intended to have an organ donation card.<sup>20</sup> In the Lomero et al.'s study, 98% of respondents stated that they agreed with organ donation.<sup>21</sup> Gill et al. (2017) also showed that only 38.2% of the participants had organ donation cards.<sup>22</sup> Alizadeh et al. studied nursing students' attitude toward organ donation and compared them with students of Islamic sciences, and reported that more than 90% of them agreed with organ donation but less than 10% of them had organ donation cards. Furthermore, gender had no significant relationship with organ donation cards.<sup>23</sup> Amani et al. study on attitude toward organ donation and willingness to donate reported no significant relationship between age ( $P = 0.13$ ) and sex ( $P = 0.42$ ).<sup>24</sup> Furthermore, Ahmad Panah et al. reported no statistically significant relationship between items of attitude toward organ donation and having an organ donation card and variables of gender ( $P = 0.080$ ) and marital status ( $P = 0.119$ ).<sup>25</sup>

In Arjmand et al.'s study on the attitude of those who had an organ donation card toward organ donation and transplant, no statistically significant relationship was found between their attitude and sex. In Madsen's study (2005) on ICU personnel's attitude toward organ donation in northern Denmark, only 49% were willing to donate organs, though they had a positive attitude toward organ donation, which is inconsistent with our study.<sup>26</sup> Meanwhile, the results of Gill et al.'s (2017) study also showed that 34.4% of nurses reported donating their organs after death and agreeing with organ donation, which is in line with the results of the present study.<sup>22</sup>

## Conclusion

Given that personnel's knowledge of DCD was moderately high and that they had a positive attitude toward organ donation, it appears that the only barrier to DCD is the absence of organ donation guidelines or protocols in ED for the staffs to identify and introduce qualified people. Therefore, it appears that considering the Iranian culture, the Transplant Center of the Ministry of Health should develop a local protocol for ED and provide the personnel with it so that they can take the required measures.

## Abbreviations

DCD: Donation after cardiac death

ED: Emergency Department

## Declarations

### Ethics approval and consent to participate

This study was approved by the Ethics Committee of Tabriz University of Medical Sciences (code: IR.TBZMED.REC.1398.082). Written informed consent was obtained from each participant.

## **Consent for publication**

Not applicable.

## **Availability of data and material**

Not applicable.

## **Competing interests**

The authors declare that they have no competing interests.

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## **Authors' contributions**

JK and ZS and VH: Selection of title. JK, and ZS and VH: Designing of the study. JK, ZS, RR and VZ: Setting up the Questionnaire. JK: data collection, JK and ZS and AMAA: Performing the statistical analysis. JK, ZS, RR and VZ: Interpreting the data. JK and ZS: Taking ethical code. JK, ZS, VZ and RR: Editing the study. All authors read and approved the final manuscript.

## **Conflict of Interest:**

The authors declare that they have no conflict of interest.

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## Tables

Table1: Sociodemographic characteristics of the participants (n=194)

Physicians			Nurses		
Variable	n (%)	Variable			n (%)
Age(year)	20-30	15 (30.6)	Age(year)	20-30	47 (32.4)
	31-40	21 (42.9)		31-40	67 (46.2)
	41-50	13 (26.5)		41-50	31 (21.4)
Gender	Male	30 (61.2)	Gender	Male	62 (42.8)
	Female	19 (38.8)		Female	83 (57.2)
Marital status	Single	14 (28.6)	Marital status	Single	46 (32.4)
	Married	35 (71.4)		Married	98 (67.6)
Education level	Ph.D.	20 (40.8)	Education level	Bachelor	125 (86.2)
	Resident	29 (59.2)		Master	20 (13.8)
Overall work experience (year)	0.5-5	24 (49.0)	Overall work experience (year)	0.5-5	46 (31.7)
	6-10	11 (22.4)		6-10	26 (17.9)
	11-15	7 (14.3)		11-15	39 (26.9)
	16-20	4 (8.2)		16-20	18 (12.4)
	≥ 20	3 (6.1)		≥ 20	16 (11.1)
ED work experience (year)	0.5-10	28 (57.1)	ED work experience (year)	0.5-10	79 (54.5)
	0.5-11	11 (22.4)		0.5-11	39 (26.9)
	0.5-12	10 (18.4)		0.5-12	27 (18.6)

Table2: Respondents' Knowledge of the Different Elements in the DCD

DCD knowledge Item (correct Answer per policy)	% Correct	
	Nurses	Physicians
Non-heart beating donor refers to an individual who has sustained a cardiac arrest and has died(T)	62.8	69.4
Non-heart beating individuals are generally not considered candidates for organ donation for transplant(T)	72.4	69.4
In conventional organ donation, organs for transplant are retrieved from a brain-dead donor following controlled cardiac arrest in an operating room(T)	76.6	71.4
People who experience sudden death at the scene, in transit, or in emergency rooms are potential non-heart beating donors(T)	61.1	55.1
Non-heart beating donors are classified based on where death occurs and duration of ischemia to facilitate reporting and interpreting transplant outcomes(T)	78.6	81.6
Donor hearts are scarcer than any other solid organ for transplant(F)	50.3	34.7
The determination of death can be made by the critical care physician, the transplant team, or the official representative of the organ procurement organization(F)	22.1	18.4
Death is declared after the irreversible cessation of circulation and respiration(T)	84.8	85.7
An official representative of the organ procurement organization is allowed to participate in the decision to withdraw life support(F)	27.6	30.6
Family members are allowed to be present at the time life support is withdrawn until death(T)	84.8	93.9
Brain death criteria must also be fulfilled before organ recovery begins(F)	24.1	16.3
After life support withdrawal, death must occur within 60 minutes, after which all organ recovery efforts must be stopped(F)	40	65.3

In some instances, organs can be recovered even if circulation does not irreversibly stop(F)	55.2	51
Life support can only be withdrawn in the operating room(F)	60.7	53.1
Five minutes of continuous pulselessness or Aystole must occur before organ recovery can begin (T)	65.5	57.1
In some instances, postmortem procedures such as Reintubation or chest tube insertion may be performed(T)	60	73.5
A patient must be on a ventilator to be considered for donation after circulatory death(T)	60	51
Consent of the patient or appropriate surrogate is required for any premortem procedures and/or medications(T)	79.3	87.8
All costs from the time of donation consent/authorization until organ procurement is the responsibility of the organ procurement organization(T)	86.2	85.7
Only the kidneys and liver can be recovered and successfully transplanted(F)	93.1	93.9

Table 3: Respondents' Attitudes of the Different Elements in the DCD

items	Strongly Agree or Agree (%)		Strongly Disagree or Disagree (%)		Mean (SD)	
	Nurses	Physicians	Nurses	Physicians	Nurses	Physicians
I feel that the DCD donation process is "easier" than the brain death donation process	47.6	65.3	17.2	20.4	2.60(1.06)	2.32(1.26)
I feel that it is easier for me to "let go" of a brain-dead patient than a DCD patient	46.2	49	23.4	42.9	2.69(1.08)	2.93(1.43)
I feel less comfortable with the death criteria for DCD than for brain death	58.6	61.2	12.4	12.2	2.39(0.92)	2.34(0.90)
I feel comfortable talking with family members about withdrawal of life support	53.1	55.1	20	34.7	2.57(1.11)	2.73(1.28)
I feel comfortable with the DCD process	22.7	12.2	30.3	44.9	3.07(0.90)	3.51(1.00)
I feel perfectly comfortable talking with family members about DCD	43.4	46.9	24.8	32.7	2.74(1.07)	2.83(1.16)
I feel that donation after brain death is not consistent with my religious or spiritual beliefs	18	12.3	46.9	59.2	3.36(0.93)	3.71(1.09)
I feel that DCD is not consistent with my religious or spiritual beliefs	14.5	14.3	46.2	61.2	3.39(0.92)	3.71(1.17)
In DCD cases, I feel perfectly comfortable giving full comfort measures to the patient	21.4	18.3	33.1	46.9	3.11(0.89)	3.38(0.97)
I feel less comfortable with the process of DCD than with donation after brain death	29.6	26.5	28.3	49	2.95(1.04)	3.30(1.14)
I feel that staffing demands for DCD	40.7	48.9	16.5	26.5	2.73(0.92)	2.69(1.08)

cases are too high and burdensome for the intensive care unit						
I feel that OPO requestors should speak to families about the DCD option when the family is considering life support withdrawal	37.5	44.9	35.9	30.6	3.05(1.08)	2.77(1.21)
I feel that the time of continuous Pulselessness or Asystole before declaring death is too short	49	34.7	24.1	34.7	2.64(1.08)	3.00(0.97)
I feel that DCD cases are more difficult and less predictable than donation after brain death cases	41.4	42.9	21.4	30.6	2.76(1.00)	2.85(1.08)
I feel that DCD cases are more stressful for critical care staff than donation after brain death cases	40.7	34.7	24.2	30.6	2.71(1.00)	2.85(1.09)
I feel that death is declared too soon in DCD cases	35.9	26.5	24.1	32.6	2.84(0.99)	2.97(0.98)
I feel that our hospital should not allow DCD	19.3	16.3	42	61.2	3.33(1.11)	3.61(1.23)
I feel that a family's decision about DCD should be part of end-of-life care, just like withdrawal of mechanical ventilation	54.5	63.3	17.3	16.3	2.53 (0.97)	2.36 (1.07)
I feel that a problem with DCD is that the health-care team has to "watch" patients take their last breath	31	34.6	30.7	47	3.02 (0.96)	3.14 (1.27)
I feel that transplant outcomes using DCD organs are just as good as those for organs recovered after brain death	33.1	32.7	14.5	18.4	2.77 (0.78)	2.85 (0.86)
I feel that DCD	32.4	24.5	31	36.7	2.90 (1.08)	3.14 (1.08)

"trivializes" the patient's death and gives the death less meaning						
I feel that DCD is less stressful for families than donation after brain death	29	26.5	37.3	44.9	3.08 (1.07)	3.30 (1.06)
I feel that DCD is psychologically less difficult than donation after brain death	32.4	28.5	27.6	40.8	2.93 (0.96)	3.26 (1.09)
I feel that most families find comfort in DCD	31	28.5	30.4	40.8	3.22 (2.68)	3.18 (1.11)
I feel that DCD allows something positive to come out of the patient's death	14.4	4.1	49.7	73.5	3.46 (0.98)	3.95 (0.95)
I feel that a family should be able to refuse DCD, even if the deceased was a registered organ donor	28.2	32.6	35.1	36.7	3.14 (1.04)	2.97 (1.12)
I feel that cultural issues are not adequately considered in DCD cases	40	38.8	15.8	18.4	2.71 (0.92)	2.77 (0.91)
I feel that the OPO cares only about the number of organs recovered	31	36.8	23.4	18.4	2.93 (0.90)	2.85 (0.95)
I feel that the OPO is trustworthy	12.5	6.1	55.2	67.3	3.62 (0.82)	3.87 (1.01)
I feel that "circulatory death" was developed solely for the purpose of increasing organ donation	20.7	26.5	37.2	38.8	3.23 (0.99)	3.12 (1.23)
I feel that the DCD policy at my medical center is implemented consistently	18	18.3	29.6	36.8	3.13 (0.83)	3.34 (1.03)
I feel that the health-care team is playing an active role in killing the patient in DCD cases	17.3	24.5	32.5	40.8	3.22 (0.89)	3.36 (1.23)

I feel that at the time of organ recovery in DCD cases, I am not sure that the patient is truly dead	17.2	16.3	49.6	62.7	3.44 (1.07)	3.75 (1.10)
I feel that with DCD we are hastening the patient's death	17.2	18.4	45.6	57.2	3.40 (1.04)	3.63 (1.16)

Table 4: Total mean scores of attitudes of nurses, physicians and emergency medicine residents

the mean total scores of nurses attitude	101.84 (SD: 9.88)
the mean total scores of emergency medicine specialists attitude	108.75(SD: 15.55)
the mean total scores of emergency medicine residents attitude	105.00(SD: 8.21)