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Study of education effect on nurses' knowledge and attitudes about organ donation at the time of brain death

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ABSTRACT

Aims: The frequency of organ transplantation in Iran in compare with European countries and United States is remarkably low and it is because of transplantable organ shortage and because of this thousands of people have been died annually, this is while we encounter with some cases of brain death every day that the organs of these patients with brain death can save life of the patients who are in need of these organs. The aim of this study was "to assess the effect of education on knowledge and attitude of nurses about organ donation".

Methods: This research was a semi-experimental in the form of test-retest study. The group of the study was 120 nurses of ICU and emergency wards of Kerman hospitals who participated in the educational seminar of brain death. Data were collected by a self-designed questionnaire (before & after education).

Results: Results showed that before education the least knowledge was about three organs of lung, pancreas and marrow that it was 73.3%, 57.5%, and 54.2% respectively, while after education it had been increased 95%, 91.7% and 80% , respectively ($p<0.001$). The average of nurses' knowledge about process of brain death and donation after education was 9.4 (±0.78) that in compare with before education had 7.5 (±2.6) significant increase ($p<0.001$). Total average of nurses' attitude towards process of brain death and organ donation before training course was 65.7 (±13.7) which had been significantly increased to 76.9 (±8.7) two weeks after education ($p<0.001$).

Conclusion: The present study showed that more educational programs are necessary for increasing knowledge about brain death and organ donation among health staff especially in ICU and emergency wards that are starter of diagnosis process of brain death patients. Special education should be started from university level and should be continued in the form of in-service training.

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1. Introduction

In developed countries, organ donation rate is 20 to 30 percent for every million people of population [1]. Organ transplantation has been known as a treatment way for the patients who suffer from organ failure [2- 4]. Thousands of patients are waiting for getting organ, while many of them die during their expectations [5, 2]. However many of the patients who suffer from organ failure do not have the same chance for transplantation [3].

There are important barriers that lead to organ shortage. For example need of kidney in middle east is 120 to 130 million per year while provided organs of the patients with brain death in this area is 4 to 10 million per year. So increase of the organs number that can be harvested and transplanted is one of the important strategic programs in most of the societies. This issue needs wide interventions in different levels, such as; organ procurement organization, society and nursing and medical staff education about content of brain death. Any way in some societies like Iran, we are encountered with low satisfaction level of the families for organ donation [6]. Transplantable organs of a patient with brain death include; heart, lungs, liver, kidneys, pancreas, small intestine, and also cornea, heart valve, skin, bone and trachea [4]. Brain death is totally accepted as a content that shows death. Brain death had been known about 40 years ago and had been considered as an ideal condition for organ donation [7]. Nowadays brain death has been accepted as certain death in most of the western countries, but in some Asian countries it is not like this [8]. Studies in the last two decades have showed remarkable bewilderments about content of brain death among nursing and medical staff [9].

Ambiguity and different understandings of brain death diagnosis seem very important and is a limiting factor of organ donation [10]. Since all the patients who suffer from brain death are hospitalized in ICU, knowledge about comprehensive content of brain death and its irreversibility is counted as a critical component in intensive care nursing profession [11,9]. Kim et.al (2006), knows it necessary to have an effective educational program for nurses in order to improve their knowledge of brain death and organ donation [3].

In the process of organ procurement, nurses play an important role [3]. Because health care staff is mostly involved in organ procurement process [12]. Success in organ procurement from corpse is dependent on ICU doctors and nurses' good cooperation, they can be a great help not only in reporting potential cases of brain death but also because of their closeness to the relatives of the patients they can be a great help for coordination organ donation request [13]. Studies have showed that one of the main reasons of organ shortage is refusal of families for giving satisfaction for organ donation of the patients with brain death, because of fear of wrong diagnosis of brain death, fear of organ trade and etc. [14, 15].

Attitude and understanding of medical staff towards brain death, organ donation and transplantation, and their tendency to get satisfaction of the families of the patients with brain death are effective on donation process [13, 16]. Having friendly relationship with the members of the patient's family by the nurses who are taking care of the organ donators (patients with brain death) leads to their faster successfulness [5, 17].

Having correct knowledge of organ donation process increases nurses' self-confidence and they can answer questions of the bereaved families [4]. However shortage of the knowledge among nurses is observed practically such as making mistake in diagnosing the difference between brain death and vegetable death. Some nurses believe that patients with brain death may return to consciousness in the future. The important question is that if nurses of ICU and emergency ward do not believe in brain death as certain death, how can they have relationship with the bereaved family of the organ donator and how can they talk to them? [18] It is expected that gaining enough knowledge causes improve of

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positive attitude towards organ transplantation [19]. There have been some studies about brain death and organ transplantation in Iran but most of them have only assessed health staff's attitudes without considering the effect of education and knowledge on that. So with this default that may be the most important reason of organ donation shortage of the patients with brain death is because of ICU and emergency nurses' attitudes and knowledge as the first point of contact with these patients, in this study we tried to assess nurses' attitude and knowledge, and with educational program to measure the effect of education on attitude and knowledge increase.

2. Materials

This is a semi-experimental study, and it was done in the form of test-retest in order to assess the effect of education on attitude and knowledge of ICU and emergency nurses of Keman's hospitals about organ donation at the time of brain death.

Data were collected through a questionnaire which had been distributed once before education and once after education among population. Sampling included 120 nurses who were working in ICU units and emergency wards of hospitals of Kerman, Sirjan, Rafsanjan, Bam, Zarand and Jiroft who participated in one- day seminar of organ transplantation of patients with brain death.

Educational seminar was hold by some of specialists about this subject, that included one nephrology subspecialty, one transplantation fellowship, one specialist in neurology, one anesthesiologist, one ICU fellowship and one forensics specialist and a person who was responsible for coordinating organ transplantation group that all are the member of confirmation of brain death. Education content includes specialists' speech about brain death, organ harvest and transplantation, conditions of organ donation and organs transplantation, keeping brain death patient, transplantation legal actions and explaining aims of transplantation group and organ transplantation coordination unit.

For data collection a four-section researcher designed questionnaire was used. The first part of the questionnaire was about assessing demographic features, the second part was about measuring nurses' knowledge, the third part included measuring nurses' attitude and the fourth part was about the importance of the organ recipient's features from nurse's point of view. In order to assess validity the questionnaire was given to some specialists who had enough knowledge about the subject (two transplantation fellowship and two nephrology subspecialist and two expert nurses who coordinate organ transplantation in the city). After their opinions and suggestions, necessary changes were done in the questionnaire (very little changes that were mostly in the editing form). In the case of reliability, Cronbach's alpha test was used. For the knowledge part, this index was acquired 0.68 and for the attitude part of the questionnaire it was 0.782. The asked demographic features in the questionnaire included: age, gender, marital status, work experience, work place, and the town of work place.

Questions relate to knowledge included 14 multiple choice questions (Likert questions) that the first question was designed for being aware of transplantable organsand the people should have chosen transplantable organs among the mentioned organs. The other 13 questions were four-choice questions with only one correct answer that was designed about knowledge of brain death donation process. For average total knowledge measurement (all the knowledge questions) a number between 1-13 was considered that if this number is nearer to 13 it shows the high level of knowledge.

Attitude questions included 18 questions that people should reveal their agreement or disagreement with choosing one of the choices of "completely disagree", "disagree", "without any idea", "agree", "completely agree" that had 1-5 scores. Method of giving score was in this

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form that score 5 was for the people who had completely positive attitude towards every question, and score 1 was for the people with completely negative attitude. For measuring a whole attitude (all 18 questions) the average number was considered between 18-90 that the closeness of a number to 90 shows positive attitude and closeness of a number to 18 shows negative attitude.

Questions related to features of the organ recipient measures the importance of some criteria (15 criteria) for organ donation from nurse's point of view. Criteria like age, gender, nationality, religious, kinship, economic and marital status, depending on the importance level of the organ recipient's features for the people, 1-10 scores were given to the choices. In this form that number 10 shows lack of importance of the organ recipient's feature and number 1 shows the importance of these features.

In order to analyze the data, SPSS software version 15 was used. Quantitative descriptive indicators (mean and standard deviation) and qualitative descriptive indicators (frequency and relative frequency) were used. For measuring nurses' knowledge score of brain death process and organ donation and knowledge about the organs that can be donated before and after education, Mcnemar test was performed and for comparing total average of nurses' knowledge before and after education Wilcoxon test was used. For comparing scores of nurses' attitudes towards brain death process and organ donation before and after the education Wilcoxon was applied. P value less than 0.05 was considered statistically significant.

3. Results

Of 88 subjects (73.3%) of the study were women, 102 (85%) of the study were married, the average age of the study subjects was 36.6 (±6.4) and the average of work experience was 12.9 (±6.9). about 57.5% of the individuals were working in ICU and others were working in emergency unit.

In assessing nurses' knowledge about the organs that can be donated with using Mcnemar test, the results showed that before education, the least knowledge about three organs of lung, pancreas and marrow were 73.3%, 57.5% and 54.2% respectively that after education it had increased to 95%, 91.7%, 80% respectively (table1). Knowledge level about the organs that can be donated increased significantly after the education ($p<0.001$).

Also with using Mcnemar test, the results showed that the lowest knowledge level was related to donation age after death, knowledge

Table 1: Knowledge about the organs that can be donated (people of the study= 120)

	Correct answers before education		Correct answers after education		
Transplantable organs	number	percent	number	percent	p-value
Kidney	117	97.5	120	100	<0.001*
liver	115	95.8	118	98.3	<0.001
heart	112	93.3	120	100	<0.001
cornea	107	89.2	118	98.3	<0.001
lung	88	73.3	114	95	<0.001
pancreas	69	57.5	110	91.7	<0.001
marrow	65	54.2	96	80	<0.001

*McNemar test

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Table 2: Nurses' knowledge about brain death process and organ donation (people of the study=120)

Questions of measuring knowledge	Correct answers before education		Correct answers after education		p-value
	number	percent	number	percent	
Knowledge about correct definition of brain death	91	75.8	117	97.5	<0.001*
Knowledge about appropriate age for organ donation after brain death	17	14.2	107	89.2	<0.001
Knowledge about existence of organ transplantation cooperation unit for reporting brain death	105	87.5	120	100	<0.001
Knowledge about that the person's signature in the organ donor card is enough	69	57.5	109	90.8	<0.001
Knowledge about the necessity of the family's satisfaction for harvesting the organs after death	61	50.8	115	95.8	<0.001
Knowing brain death team specialists	103	85.5	120	100	<0.001
To know that organs donation and transplantation is free for the patient's family	98	81.7	118	98.3	<0.001
Knowledge about necessary cares for the heath of body of the patient with brain death	34	28.3	114	95	<0.001
Knowledge about the standards of brain death diagnosis	56	46.7	118	98.3	<0.001
Knowledge about necessary tests and examinations for being sure of the health of the organs of the patient with brain death	54	45	97	80.8	<0.001
Knowledge about the appropriate time for harvesting body organs after brain death diagnosis	75	62.5	99	82.5	<0.001
Knowledge about the conditions of transforming the patient with brain death	101	84.2	120	100	<0.001
Knowledge about the way of holding the transplanting organs after harvesting	37	30.8	118	98.3	<0.001

* McNemar test

about taking care and keeping for maintaining body of the patient with brain death and knowledge about the way of taking care of transplantation organs that 14.2%, 28.3% and 30.8% respectively could answer these questions correctly. After education it had increased to 89.2%, 95%, 98.3% respectively that this increase was statistically significant (p<0.001) (table 2). In assessing nurses' knowledge about brain death process and donation with using Wilcoxon test the results showed that the average of nurses' knowledge before education was 7.5 (±2.6) that after education it had been increased to 9.4 (±0.78) that this increase was statistically significant (p<0.001).

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Table 3: Nurses' attitudes towards brain death and organ donation (people of the study= 120)

Questions of assessing attitude	Before education		After education		p-value
	Mean	SD	Mean	SD	
To know that improvement of the patient with brain death is impossible	3.6	1.1	4.6	0.73	<0.001*
Ability to take decision about donating his/her organs	3.5	1.4	4.3	0.86	<0.001
Not having fear of thinking about organ donation	3.8	1.3	4.4	0.83	<0.001
Organ donation even before death	2.4	1.4	3.3	1.5	<0.001
Lack of contradictoriness of organ donation with natural process of life and death	2.9	1.1	3.5	0.64	<0.001
Opposition with this attitude that harvesting the organs causes pain and discomfort for the patient	4.2	0.93	4.6	0.61	<0.001
Calm of the spirit after organ donation	3.7	1.0	4.2	0.92	<0.001
Organ donation is a way for freedom from the sin	2.9	1.0	3.3	1.1	<0.001
Discrepancies of organ donation with the person's religious believes	3.8	1.2	4.3	0.84	<0.001
Unwillingness to that body organs remain intact after death	3.6	1.3	4.3	0.93	<0.001
Knowing organ donation as a sacrifice	4.3	0.85	4.7	0.61	<0.001
Feeling of survival after organ donation	3.7	1.1	4.3	0.79	<0.001
Opposition with this attitude that harvesting the organs causes desecration of corpse	4.1	1.0	4.6	0.61	<0.001
To know that organ donation causes consolation of the relatives	3.5	1.0	4.2	0.90	<0.001
Suggestion of having organ donor card to others	3.8	1.1	4.6	0.65	<0.001
Ability to attract satisfaction of the family of the patient with brain death to donate the patient's organs	2.9	1.2	3.3	1.2	<0.001
To know it necessary to develop organs donation culture after death	4.2	1.0	4.8	0.35	<0.001
To know that nurses' role in promoting organs donation after death is important	4	1.0	4.7	0.57	<0.001

*Wilcaxon test

Also assessing attitude questions showed that the most opposite attitude was related to "organs donation before death" that was with the average of 2.4 and standard deviation of 1.4, that after education it had been increased to 3.3 (±1.5) ($p<0.001$). After that the least average was related to attitude towards "contradictoriness of organ donation with natural process of life and death", opposition with this attitude that "organ donation causes

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freedom from sin" and "ability to attract satisfaction of the family of the patient with brain death" was 2.9 each that after education it had increased to 3.5, 3.3 and 3.3 respectively ($p<0.001$). Also the most favorable attitude was related to "knowing it a great sacrifice to donate the organs", "opposition with this attitude that harvesting the organs causes pain and discomfort for the patient", "and knowing it necessary that organs donation culture after death should be promoted" that the average number of these cases were 4.3 (±85), 4.2 (±0.93) and 4.2 (±0.35) respectively that after education these cases had increased significantly ($p<0.001$) (table 3). Assessing nurses' attitude towards brain death process and organs donation showed that the whole average of people's attitude was 65.7 (±13.7) that after education it had increased to 76.9 with the standard deviation of 13.7 ($p<0.001$).

Among organ recipient's features, being a Muslim, being relative first degree and poorness of the recipient have been important for most of the people, that the average of tendency was to donate organs to Muslim 8.1 (±3.3), first degree relative 8.4 (±3.1) and poor recipient 8 (±3.4), that after education they had significantly improved to 9.7(±1.3), 9.8(±0.96) and 9.7(±1.1) respectively. Closeness of the average number to 10 shows that there is more tendency to donate organs to recipients with the mentioned features.

Also the important average of organ recipient features for people, before education was 8.102 (±47.3) that after education it had enhanced to 138.5 (±17.7). Closeness of this number to 150 shows that the average of people that are ready to donate organs without considering features like age, nationality, religion, relativeness, economic situation and marital status of the organ recipient have increased. Totally 30 people (25%) of the study had organ donor card, among the others %75 , 57.8% before education explained that they like to achieve organ donor card and this measure have increased to 88.9% after education.

4. Discussion

Along with developing technology, while candidates of using organ transplantation tratment method increase, inadequate donation rate has been remained [20]. Professional attitude of health and treatment staff towards organ donation and their tendency to get close to the relatives of the patient with brain death impress bereaved family for donation remarkably [3,21].

This study that had been done in order to assess the effect of education on knowledge and attitude of ICU and emergency nurses showed that education causes increase of positive knowledge and attitude towards organ donation. As a whole in this study there was the least knowledge level about donation age, taking care of the patient and the way of taking care of the body organs before education that after education they had been increased. The most important reasons for disagreement with organ donation were to think that organ donation is in contradictory with natural process of life and death. This negative belief had been decreased after education. The results of other studies have shown that education in people that disagreed with organ donation caused change in their attitudes, knowledge and religious believes and changed decisions of most of them to agreement with organ donation [23].

Also the study showed that attitudes of people towards brain death and organ donation is under the effect of their knowledge about this subject and a positive correlation between nurses' knowledge and attitude has been achieved. Unfortunately, knowledge, experience, attitude and believes of heath staff related to this process have been ignored to a large extent. Akgan et.al (2003) in sectional assessment of knowledge and personal attitudes of doctors and nurses, had confirmed negative effect of lack of knowledge on attitude and they had explained that people's attitudes towards organ donation is under the effect of some factors such as knowledge, education and religious [23]. In another study that assessed medical and nursing students' attitudes,

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significant relationship between positive attitude and personal tendency for organ donation had been achieved. Also this study confirms the importance of continuity of education to nurses related to organ donation [24].The results of the study that assessed nurses, understanding of the content of brain death confirmed that almost half of the samples of the study had a vague concept of brain death in their mind and they did not accept it as the certain death [9, 10].

Tavil et.al (2012) achieved the same results among medical students [11]. Other studies achieved a strong relationship between health staff education and donation level. The study that assessed nursing staff attitudes in two different countries indicates that since health group attitudes can have extreme negative effect on the public, it is necessary to promote information about organ donation [25]. In the study of Louyeez et.al (2010) nursing students had been studied and they showed that favorable attitude towards organ donation after brain death had been increased from 87% to 94% withholding a training course about this subject [26]. Melow et.al (2011) assessed believes, attitudes, knowledge and behavior of doctors and nurses of emergency wards and ICU towards organ donation from corpse and transplantation. The results showed that nurses of emergency ward were not under special educations about organ donation and they need to be educated. This study achieved remarkable difference in knowledge between doctors and nurses bout the issues related to transplantation and organ donation and showed that the reasons of low donation rate are related to problems of starting organ donation process, brain death diagnosis and achieving to necessary human sources [16].

Mousavi's study (2001) on ICU nurses' attitudes in Kuwait showed that most of the ICU staffs approved the importance of organ donation from the corpse for saving human's life and the necessity of cooperation with transplantation unit in the report of potential recipient's cases. Anyway there was chant among staff for reporting the cases that caused delay in reporting and at the end losing many cases before completing the tests because of cardiac arrest and etc. [13].

Nasrollahzadeh (2003) studied 130 nurses of ICU; this study showed that some nurses despite having positive attitudes toward donation do not like to take satisfaction from patients' family. They explained that most of the reasons for opposition are related to shortage of knowledge about diagnosing brain death and organ transplantation [27]. Another study in Iran showed that the main reasons for not donating organs are lack of perception of brain death; believe in miracle and returning of the patient, fear of rumors about selling the organ instead of organ donation, fear of change in the shape of body [28]. Study of Rioz et.al (2010) also showed that lack of correct perception of brain death content, fear of cutting organ of the body, fear of manipulation in the body after death are the reasons of disagreement with organ donation [25]. Religion believes, not being sure of correct diagnosis of brain death, believe in completion of the body after death, and fear of complain of the other relatives are the other reasons for weak acceptance of organ donation [29].

Nurses' attitudes towards organ donation are different and may show chant and doubt. For example it has been seen in other studies that some nurses do not agree with organ donation after death. Most of them explained that the reason of disagreement is showing respect to the body [30].

Fokoshima (2012) believes that for developing organ donation. Developing the following program is necessary in the country; organ transplantation rule, a channel for specifying and sharing the organ, public knowledge, basic training for medical students, doctors, nurses, medical engineers and etc. [31].

5. **Conclusion**

The limitation that this study encountered was decrease of the main samples because of lack of tendency of some nurses in participating in the

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study that included a little number. According to the results of this study it has been suggested that there should be more training programs about increase of knowledge level, it should be done not only for nurses but also medical and paramedics staff and common people. It is clear that education should be started from university level and it should be continued in the form of in-service trainings. It should be mentioned that in another study, effect of different methods of education (speech, workshop, film, pamphlet and etc.) on peoples' knowledge and attitudes can be studied. Also it is suggested that this study should be done with more samples on nurses of other units of hospital.

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