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Effects of Theoretical and Clinical Education on Nursing Students' Knowledge and Attitude Toward the Organ Donation Process

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Abstract:

Introduction: Organ transplantation is a significant achievement in modern medicine, closely linked to public understanding of brain death and organ donation. Nursing students play a vital role in promoting organ donation. This study aims to evaluate the effects of theoretical and combined theoretical-clinical training on nursing students' attitudes and knowledge regarding organ donation.

Materials and Methods: An experimental pre- and post-test design study was conducted with 90 nursing students from Mashhad University of Medical Sciences and Islamic Azad University. Participants were divided into three groups: one received only theoretical training, the second received combined theoretical-clinical training by attending patient bedsides, and the third group served as a control with no training. All groups completed researcher-developed questionnaires before and after the intervention.

Results: Knowledge and attitudes significantly improved in the theoretical and combined training groups compared to the control group (p <0.05). However, no significant difference in knowledge was found between the two intervention groups (p >0.05).

Discussion: The study indicates that both training methods enhance nursing students' knowledge and attitudes toward organ donation, with clinical exposure notably improving attitudes. This highlights the importance of experiential learning in nursing education to prepare students as advocates for organ donation. Future research should explore the long-term impacts of such training on knowledge retention and actual organ donation rates.

Conclusion: Theoretical training significantly enhanced knowledge, while both training interventions improved attitudes. This suggests that integrating clinical practice with theoretical training is crucial for fostering nursing students' advocacy for organ donation.

Keywords: Nursing education, Organ donation, Knowledge, Attitude, Brain death, Organ donation rates.

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1. INTRODUCTION

Organ transplantation is a preferred treatment for patients with chronic organ failure, involving the transfer of a healthy organ from a donor [1]. It is one of the great advances in modern medicine that improves the quality of life and increases life expectancy for the person receiving the organ [2]. The World Health Organization (WHO) defines brain death for organ donation based on neurological criteria, while circulatory arrest is assessed using cardiopulmonary criteria [3]. With the development of special care and resuscitation techniques, patients with cardiorespiratory arrest can be rescued, so currently, donation after brain death is the standard strategy for organ transplantation [4, 5]. The prevalence of organ transplantation requirements is about 25000 per year in Iran [2, 6]. However, according to the latest studies, about 5 to 8 thousand brain deaths occur annually in Iran, but only 30% of patients receive organs [7]. The organ donation rate is 43.4 per million in Spain and between 20 and 30 per million in the United States. However, in Iran, the organ donation rate was about 14.34 per million in 2019, which ranked Iran in 21st place in the world [8, 9].

Identifying the obstacles and misconceptions surrounding organ donation is essential to save lives and enhance the willingness to donate organs [10]. Among these factors are religious beliefs [11, 12], level of education [13], and finally, making the deceased person's organ donation subject to the consent of his family and not paying attention to the legal effects of the organ donation card issued to the person [2]. According to reports from the Organ Donation Center, there is a 27.7% chance that a potential organ donor converts into an actual donor [5]. As a result, it is necessary to train specialists to convince families of brain-dead individuals to donate the organs of the deceased. Physicians and nurses have more significant roles in achieving this goal [14]. Nurses are among the most critical members of the donation team, and they have a positive attitude and good knowledge that can facilitate the organ donation process [15]. Based on a previous study, the knowledge and attitude of nurses working in the intensive care units (ICU), especially nurses with organ donation cards, can play an influential role in encouraging the families of brain-dead patients toward organ donation [16]. A study indicated that staff in emergency and specialty care departments require educational programs to improve their understanding of brain death and organ donation. It is better to start training at the university level, and such efforts will significantly improve the positive attitudes toward organ donation in Iran [7, 17].

Since enhancing organ donation is a key treatment priority, increasing knowledge and fostering a positive attitude among nurses can empower them to persuade the families of deceased individuals to donate organs, thereby addressing the shortage of available organs. Workshops, educational booklets, and clinical training are among the best ways to increase nurses' knowledge of this goal. The training can start from various educational and occupational levels [14]. Training nursing students is viewed as a vital strategy to boost future organ donations in Iran, which can help ensure that necessary organs are available for patients in need [18, 19]. However, despite the recognized importance of education, few studies in Iran have directly compared the effects of different educational approaches—such as theoretical instruction alone *versus* combined theoretical and clinical training—on nursing students' knowledge and attitudes toward organ donation. Most existing studies have focused on practicing nurses rather than nursing students, leaving a gap in understanding how early educational interventions can shape future nurses' readiness to promote organ donation [20].

Therefore, the unique contribution of this study lies in evaluating and comparing the impact of theoretical and combined (theoretical plus clinical) training on nursing students' knowledge and attitudes regarding organ donation. This approach provides evidence on the most effective educational strategy to cultivate positive attitudes among future nurses, who will play a key role in advocating for organ donation in clinical settings [14, 20].

Based on this objective, the study tests the following hypotheses:

H1: Theoretical training significantly increases nursing students' knowledge of organ donation compared with the control group.

H2: Combined theoretical and clinical training significantly improves nursing students' attitudes toward organ donation compared with both theoretical training alone and the control group.

Consequently, this study seeks to examine the impact of theoretical training, as well as a combination of theoretical and clinical training, on nursing students' attitudes and knowledge regarding organ donation, and to compare these outcomes with those of a control group.

2. MATERIALS AND METHODS

2.1. Participants

This quasi-experimental pretest–posttest with a non-equivalent control group study involved 90 senior nursing students from Mashhad University of Medical Sciences and Mashhad Islamic Azad University, conducted between 2021 and 2022. Inclusion criteria included having no prior training in organ donation or transplantation, no family history of organ donation or transplantation, and a willingness to participate in the study.

The sample size for the present study was estimated based on a similar study by Abbasi Dolatabadi and colleagues [20]. The determination of the sample size was therefore guided by the magnitude of change in participants' knowledge observed in the reference study. Additionally, the design of the current study differs from prior research. Participants in this study were directly exposed to the clinical setting of brain-dead patients, gaining hands-on familiarity with the organ donation process, whereas interventions in comparable studies were delivered exclusively through lecture-based or theoretical training. Considering this difference in intervention design and referencing the sample size calculation from the

previous study, the current sample size was determined in a scientifically justified and methodologically sound manner. Bearing these points in mind and aiming for a confidence level of 95% and a power of 80%, the sample size for each group was determined to be 28 individuals.

Exclusion criteria consisted of a lack of interest in participating and any prior training on related topics that could influence results. Participants were chosen through a convenience non-probability sampling method. The participants were divided into three groups: theoretical training, combined theoretical-clinical training, and a no-training group, with each group consisting of 30 students.

Two different educational centers were selected to prevent the exchange of information between groups. The control group was selected from another university to avoid any information leakage or transfer between participants in the intervention and control groups. However, in terms of the level of theoretical education received regarding brain-dead patients, all three groups were under the same conditions. None of the participants had received any formal training or had prior clinical experience related to brain-dead patients before the implementation of the study. Therefore, the difference in research settings was solely intended to control information transfer and not due to any difference in the educational level of the participants.

The theoretical training group received two hours of instruction covering the etiology and pathophysiology of organ donation, the history of transplantation, the Islamic perspective on organ donation, clinical symptoms and diagnostic tests for brain death, confirmation of diagnosis, complications of brain death and their management, the organ donation process, and the role of the organ procurement unit. The training also addressed indications and contraindications for organ donation, ethical considerations, the role of nurses, and nursing care procedures for brain-dead patients. Participants in this group completed pre- and post-training questionnaires.

The combined theoretical–clinical training group received the same two-hour theoretical instruction as the theoretical training group. Additionally, 29 participants in this group attended a two-hour bedside session with a brain-dead patient in groups of 5–10 at various times at Montaserieh Hospital. During these sessions, students observed the brain death confirmation process and became familiar with the transplantation department and the hospital's organ donation card issuance unit. Both intervention groups completed questionnaires before and after their training sessions.

The no-training group, consisting of 30 nursing students from Islamic Azad University, served as the control group. Prior to enrollment, written informed consent was obtained from all participants in all groups in accordance with the Declaration of Helsinki. The Ethics Committee of Mashhad University of Medical Sciences also approved this project with the code IR.MUMS.REC.1394.361.

2.2. Instruments

A researcher-developed questionnaire was utilized to assess the intervention. This questionnaire consisted of three sections that measured demographic information, attitudes, and knowledge. The content validity of the questionnaire was evaluated by consulting experts at Mashhad University of Medical Sciences.

The demographic information section of the questionnaire comprised 10 general items related to age, gender, marital status, willingness to donate organs, the need for training courses, possession of an organ donation card, and history of blood donation. The attitude section featured 16 items rated on a five-point Likert scale, ranging from 1 (completely disagree) to 5 (completely agree). The knowledge section included 8 items covering the definition of brain death, its potential and actual characteristics, the distinction between brain death and coma, rules regarding organ donation, contraindications, medical and legal conditions for organ donation eligibility, and the process of transferring a brain-dead individual. Correct answers were scored as one point, while incorrect answers received zero points. The knowledge questionnaire included items such as "Brain death is the same as coma" and "Brain death is the irreversible cessation of brain and brainstem activity." The attitude questionnaire included items such as "I consider organ donation beneficial for humanity" and "I believe that organ donation from a brain-dead person is a benevolent and ethical act." The internal consistency of the questionnaires was examined using Cronbach's alpha, which yielded values of 0.81 for the knowledge section and 0.86 for the attitude section.

2.3. Statistical Analysis

Data were analyzed using SPSS version 22. To compare continuous variables across the three groups, one-way ANOVA was employed. Additionally, analysis of covariance (ANCOVA) was utilized to compare the three groups while controlling for pretest scores. A *p*-value of less than 0.05 was considered statistically significant in all cases. Data were complete for all participants, and no values were missing for any of the variables included in the analyses.

3. RESULTS

Demographic data are presented in Table **1**. The average age of the participants was 23.07 ± 2.38 years, with 61.1% being female. Table **1** also includes additional information regarding marital status, familiarity with the donation card unit, history of blood donation, social activities, and training.

Table **2** compares the pre-and post-intervention mean scores of knowledge and attitude among the three groups. The results indicate a significant difference among the three groups in both pre-and post-tests ($p < 0.05$). The results of ANOVA showed that after controlling for pre-scores, there was a significant difference between the three groups ($p < 0.001$).

The results of the post hoc test for multiple comparisons are shown in Table **3**. There was a significant difference in the knowledge scores between the theoretical training and combined theoretical-clinical training groups compared to the control group ($p < 0.001$), while no significant

difference (p = 0.664) was found between the knowledge scores of the two intervention groups (Table 3). However, the attitude scores among all three groups showed significant differences. These findings are summarized in Table 3.

Table 1. Demographic characteristics and comparability of participants.

-		Control N (%)	Theoretical & Clinical Training N (%)	Theoretical Training N (%)	*p*-value
Gender[@]	Male	9 (30.0)	16 (53.3)	10 (33.3)	0.13
	Female	21 (70.0)	14 (46.7)	20 (66.7)	
Age (Mean ± SD)*	-	22.43 ±1.19	23.50 ±3.60	23.27 ±1.55	0.19
Marriage	single	19 (63.3)	20 (66.7)	12 (40.0)	0.08
	married	11 (36.7)	10 (33.3)	18 (60.0)	
Familiarity with card unit	Yes	18 (60.0)	10 (33.3)	15 (50.0)	0.11
	no	12 (40.0)	20 (66.7)	15 (50.0)	
Knowledge method[#]	Book	0 (0.0)	1 (33.3)	2 (2.7)	0.83
	Journal	1 (3.33)	0 (0.0)	1 (3.3)	
	Internet	10 (33.3)	8 (26.7)	8 (26.7)	
	Medical book	1 (3.33)	0 (0.0)	0 (0.0)	
	Others	18 (60.0)	21 (70.0)	9 (63.3)	
CARD[#]	Yes	3 (10.0)	3 (10.0)	7 (23.3)	0.30
	no	27 (90.0)	27 (90.0)	23 (76.7)	
Blood donation[@]	Yes	0 (0.0)	6 (20.0)	6 (20.0)	0.03
	no	30 (100.0)	24 (80.0)	24 (80.0)	
Social activity[@]	Yes	22 (73.3)	24 (80.0)	26 (86.7)	0.44
	no	8 (26.7)	6 (20.0)	4 (13.3)	
Recommended card[#]	Yes	23 (76.7)	26 (86.7)	26 (86.7)	0.63
	no	7 (23.3)	4 (13.3)	4 (13.3)	
Recommended organ donation[@]	Yes	18 (60.0)	23 (76.67)	22 (73.3)	0.32
	no	12 (40.0)	7 (23.3)	8 (26.7)	
Need organ	Yes	5 (16.7)	2 (6.67)	1 (3.3)	0.26
	no	25 (83.3)	28 (93.3)	29 (96.7)	
Training[@]	Yes	19 (63.3)	27 (90.0)	23 (76.7)	0.051
	no	11 (36.7)	3 (10.0)	7 (23.3)	

Note: @: Chi Square *: One way ANOVA #:Fisher exact test.

Table 2. Distribution and comparison of knowledge and attitude scores in pre-and post-tests by groups.

-	-	Pre	Post	Diff	Paired T test *p*-value	ANCOVA
Knowledge	Control	3.1 ±1.39	3.63 ±1.52	0.53 ±0.97	0.005	*p*-value<0.001
	Theoretical + clinical	4.13 ±1.25	5.83 ±0.59	1.70 ±1.34	<0.001	
	Theoretical	4.27 ±0.87	6.07 ±0.78	1.80 ±1.30	<0.001	
	df	2	2	-	-	-
	F	8.58	49.52	-	-	-
	ANOVA *p*-value	<0.001	<0.001	<0.001	-	Partial Eta=0.44
Attitude	Control	67.53 ±7.10	67.50 ±6.33	0.03 ±3.22	0.95	*p*-value<0.001
	Theoretical + clinical	72.17 ±7.28	92.13 ±4.97	19.97 ±8.5	<0.001	
	Theoretical	66.80 ±6.07	87.80 ±4.48	21.0 ±7.10	<0.001	
	df	2	2	-	-	-
	F	5.43	183.21	-	-	-
	ANOVA *p*-value	0.006	<0.001	<0.001	-	Partial Eta=0.82

Table 3. Post hoc Tests for multiple comparisons between control and intervention groups.

-	[I] Group	[J] Group	Mean Difference [I-J]	Std. Error	*p*-value
Knowledge	Control	Theoretical + clinical	-2.20*	0.270	<0.001
		Theoretical	-2.43*	0.270	<0.001
	Theoretical + clinical	Control	2.20*	0.270	<0.001
		Theoretical	-0.23	0.270	0.664
	Theoretical	Control	2.43*	0.270	<0.001
		Theoretical + clinical	0.23	0.270	0.664
Attitude	Control	Theoretical + clinical	-24.63*	1.374	<0.001
		Theoretical	-20.30*	1.374	<0.001
	Theoretical + clinical	Control	24.63*	1.374	<0.001
		Theoretical	4.33*	1.374	0.006
	Theoretical	Control	20.30*	1.374	0.000
		Theoretical + clinical	-4.33*	1.374	0.006

4. DISCUSSION

The present study aimed to assess the effects of theoretical training and a combination of theoretical and clinical training on the knowledge and attitudes of nursing students at Mashhad University of Medical Sciences regarding organ donation from 2021 to 2022. The results indicated that training enhances nursing students' knowledge and positively alters their attitudes. Initially, there was a difference in average knowledge and attitude scores between the intervention and control groups. This finding may have been influenced by various factors, such as the severity of the diseases of patients visited by nursing students, socioeconomic status, or workload. However, following the intervention, the mean scores for knowledge and attitude improved in both intervention groups.

The study revealed no significant difference in knowledge gain between the theoretical-only group and the combined theoretical-clinical training group. This outcome implies that the addition of brief clinical exposure, on its own, may not substantially enhance learning when theoretical teaching is already thorough and well-structured. One plausible reason is that the students' time in the clinical setting was short and primarily observational, offering limited opportunity to apply or internalize theoretical concepts. It is also possible that, during their encounters with brain-dead patients, the students concentrated more on the emotional and ethical dimensions of the situation rather than on its procedural or technical aspects, which could explain the modest improvement in measured knowledge.

Abbasi Dolatabadi and colleagues reported similar findings in Tehran [20]. Additionally, Manzari and colleagues noted an increase in nurses' knowledge, attitudes, and performance regarding the organ donation process after implementing an indigenous model focused on continuous improvement and assurance in the organ donation process. They also advocated for the use of educational workshops and materials [21].

In a 2020 study involving 384 medical students in Mexico, Marvan and colleagues found that students, particularly nursing students, exhibited a lack of knowledge and negative attitudes toward organ donation. Some participants believed that recovery was possible after brain death, while others mistakenly thought there was an age limit for organ donation [22]. Almutairi and colleagues conducted research with 467 students from medicine, dentistry, nursing, physiotherapy, and paramedicine to assess their knowledge, attitudes, and willingness to donate organs in their final year of study. The findings revealed low scores across all fields, except for medicine and physiotherapy students. Additionally, female students outperformed male students in all three areas [23]. Valiee and colleagues investigated nurses' knowledge and attitudes regarding organ donation, discovering that most participants lacked a donation card and that overall knowledge and attitudes were low [17]. The results of various studies indicate that nurses play a crucial role in promoting organ donation and that training significantly enhances their knowledge and attitudes [14].

In the current study, prior to the intervention, all students exhibited positive attitudes toward organ donation. However, only a small number of students possessed an organ donation card or had a history of blood donation. This finding reflects the persistent gap between attitude and behavioral intention. Taghiabadi and colleagues found similar results, noting that while nursing students held a positive attitude toward organ donation, only a few had an organ donation card [24]. Furthermore, Chen and colleagues demonstrated that individuals with a history of blood donation were more inclined to donate organs [25].

Amani and colleagues found that 68% of students received information about organ donation from the media [26]. This highlights the importance of mass media and social campaigns in shaping public and professional awareness. Consequently, raising public knowledge by honoring donor families at ceremonies featuring artists and religious leaders on television could enhance families' understanding of the importance and moral significance of organ donation.

Both theoretical training and combined theoretical–clinical training in the current study increased knowledge and attitude levels, although the change in attitude was less pronounced than that in knowledge. This outcome suggests that attitude modification requires

sustained reinforcement through repeated exposure, discussion, and role modeling rather than short-term instruction.

Currently, there is no educational program within the nursing curriculum that addresses organ donation topics. In line with DÜKEN and YAYAN, who explored the long-term psychosocial impacts on organ recipients, it becomes clear that nursing education should go beyond the technical and procedural aspects of organ donation. The findings of the present study can inform curriculum development by integrating teaching materials that address not only the organ donation process but also the psychosocial challenges faced by recipients and their families, including post-transplant adjustment and the need for family support. Such holistic training can prepare nursing students to handle the emotional and ethical complexities of transplantation, ultimately improving patient and family care outcomes.

5. LIMITATIONS AND RECOMMENDATIONS

This study has several limitations that should be acknowledged. The first relates to the sample size and selection. The research involved 90 nursing students from two universities, which limits the generalizability of the findings. A small and geographically restricted sample reduces statistical power and may not represent the broader nursing student population across diverse cultural or institutional settings.

The composition of the control group also warrants attention. The control participants were drawn from a different university, introducing potential variability in academic standards, curriculum exposure, and learning environments. Such institutional differences may have influenced baseline knowledge or attitudes, thereby affecting the comparability of groups and the internal validity of the findings.

Another limitation involves the use of self-reported questionnaires to measure knowledge and attitudes. Although convenient, self-reports are prone to social desirability and recall biases, meaning participants may have provided responses they perceived as favorable rather than reflecting their actual understanding or beliefs.

Additionally, the study did not examine how socioeconomic, cultural, or religious factors might shape students' perceptions and willingness to donate. Neglecting these contextual influences may have limited the depth of interpretation, as such factors can play a pivotal role in shaping ethical decision-making and personal attitudes toward organ donation [17].

Future studies should aim to address these limitations by employing larger, more diverse samples and utilizing randomized controlled trial (RCT) designs within a single academic institution to reduce confounding effects. Incorporating mixed-method approaches—combining quantitative assessments with qualitative interviews—could provide richer insight into how education influences both cognitive and emotional dimensions of attitude change. Moreover, future educational interventions should integrate structured reflection and cultural sensitivity components to more effectively translate knowledge gains into sustained attitudinal and behavioral changes.

CONCLUSION

This research underscores the important role that education plays in shaping nursing students' understanding and attitudes toward organ donation. The study found that both theoretical training and a combination of theoretical and clinical experiences significantly improved students' knowledge and perspectives compared to those who did not receive any training.

The results clearly indicate that well-structured educational programs can enhance nursing students' knowledge and positively influence their attitudes, which is crucial as these future professionals often engage with families during sensitive moments regarding organ donation decisions.

While both training interventions were effective in enhancing attitudes, the improvement was more pronounced in the combined training group, highlighting the potential benefits of clinical exposure. These results underscore the importance of integrating practical experiences into nursing education to foster positive attitudes toward organ donation.

However, it is essential to note that changes in attitude do not necessarily translate to behavioral changes in real-world scenarios. Future research should focus on longitudinal studies to evaluate the lasting effects of such educational interventions and their impact on actual organ donation rates.

AUTHORS' CONTRIBUTIONS

The authors confirm their contribution to the paper as follows: M.A.: Study conception and design; E.K., Z.S.M.: Analysis and interpretation of results; M.M.: Data curation; Z.K.: Writing - reviewing and editing; M.A.: Conceptualization. All authors reviewed the results and approved the final version of the manuscript.

LIST OF ABBREVIATIONS

WHO	=	World Health Organization
RCT	=	Randomized Controlled Trial

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The Ethics Committee of Mashhad University of Medical Sciences, Iran approved this project with the code IR.MUMS.REC.1394.361.

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

Written informed consent was obtained from all participants.

STANDARDS OF REPORTING

TREND guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data generated and analyzed during this study will be made available upon request to the corresponding author [M.A].

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CONFLICT OF INTEREST

The author(s) declare no conflict of interest, financial or otherwise.

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REFERENCES

[1] Talebi Doluee M, Khaleghi Beygi E, Tohidi T, Abbasi Z. Investigating the effect of interventions to increase the number of organ donations in brain deaths during the years 2016–18 in Mashhad University of Medical Sciences. Med J Mashhad Univ Med Sci 2020; 63(4): 2472-81. http://dx.doi.org/ 10.22038/mjms.2020.17164

[2] Sadeghi E, Fehresti Z, Yaghouti E. Analysis of solutions for developing resources of organ donation: A donation card approach. Medical Law J 2020; 14(53): 173-93.

[3] Domínguez-Gil B, Delmonico FL, Shaheen FAM, *et al*. The critical pathway for deceased donation: Reportable uniformity in the approach to deceased donation. Transpl Int 2011; 24(4): 373-8. http://dx.doi.org/10.1111/j.1432-2277.2011.01243.x PMID: 21392129

[4] Manara AR, Thomas I. Current status of organ donation after brain death in the UK. Anaesthesia 2020; 75(9): 1205-14. http://dx.doi.org/10.1111/anae.15038 PMID: 32430995

[5] Yoshikawa MH, Rabelo NN, Welling LC, Telles JPM, Figueiredo EG. Brain death and management of the potential donor. Neurol Sci 2021; 42(9): 3541-52. http://dx.doi.org/10.1007/s10072-021-05360-6

[6] Fazlju E, Dadgari A, Akbar E. Evaluation of the impact of peer Education on knowledge and attitude towards Electroconvulsive therapy in Shahid Sadoughi University nursing student,1390. Community Health J 2017; 5(1): 1-7.

[7] Parsa P, Taheri M, Rezapur-Shahkolai F, Shirahmadi S. Attitudes of Iranian students about organ donation: A qualitative study. BMC Med Ethics 2019; 20(1): 36. http://dx.doi.org/10.1186/s12910-019-0372-z PMID: 31138188

[8] Abbasi P, Yoosefi Lebni J, Nouri P, Ziapour A, Jalali A. The obstacles to organ donation following brain death in Iran: a qualitative study. BMC Med Ethics 2020; 21(1): 83. http://dx.doi.org/10.1186/s12910-020-00529-8 PMID: 32873305

[9] Abbasi Z, Peyman A. Brain death and organ donation in Iran. Medical Law Journal 2012; 6(20): 43-54.

[10] Heitland L, von Hirschhausen E, Fischer F. Effects of humorous interventions on the willingness to donate organs: a quasi-experimental study in the context of medical cabaret. BMC Public Health 2020; 20(1): 288. http://dx.doi.org/10.1186/s12889-020-8400-y PMID: 32131795

[11] Muliira RS, Muliira JK. A review of potential Muslim organ donors' perspectives on solid organ donation: lessons for nurses in clinical practice. Nurs Forum 2014; 49(1): 59-70. http://dx.doi.org/10.1111/nuf.12041 PMID: 24456554

[12] Padela AI, Zaganjor H. Relationships between Islamic religiosity and attitude toward deceased organ donation among American Muslims: A pilot study. Transplantation 2014; 97(12): 1292-9. http://dx.doi.org/10.1097/01.TP.0000441874.43007.81 PMID: 24646775

[13] Ghorbani F, Khoddami-Vishteh HR, Ghobadi O, Shafaghi S, Rostami Louyeh A, Najafizadeh K. Causes of family refusal for organ donation. Transplant Proc 2011; 43(2): 405-6. http://dx.doi.org/10.1016/j.transproceed.2011.01.031 PMID: 21440717

[14] Sadat Hejazi S, Nikbakht S, Jouybari L, *et al*. Knowledge and attitudes toward brain death and organ donation in Bojnurd. Electron Physician 2017; 9(7): 4746-52. http://dx.doi.org/10.19082/4746 PMID: 28894530

[15] Vlaisavljević Z, Milutinović D, Milićić B, Jesić-Vukićević R. Attitudes and knowledge of nurses on organ legacy and transplantation. Srp Arh Celok Lek 2014; 142(3-4): 213-8. http://dx.doi.org/10.2298/SARH1404213V PMID: 24839777

[16] Purbahram R, Ashktorab T, Barazabadi Farahani Z, Nasiri M. Knowledge and attitude of the intensive care unit nurses in mazandaran province towards organ donation. Iran J Nurs 2017; 30(107): 1-9. http://dx.doi.org/10.29252/ijn.30.107.1

[17] Sina V, Shoaib D, Shiva M, Sahar D, Farzaneh K. Study of knowledge and attitude of nurses in Sanandaj city toward organ donation. Nursing Practice Today 2019; 6(2): 77-85. http://dx.doi.org/10.18502/npt.v6i2.912

[18] AfzalAghaee M, Khorsand Vakilzadeh A, Rahmanifar F, Movahed nia N, Khaleghi E. Factors related to organ donation from brain dead patients in teaching hospitals of Mashhad University of Medical Sciences during 1392-1385. Med J Mashhad Univ Med Sci 2016; 59(3): 148-54. http://dx.doi.org/10.22038/mjms.2016.7715

[19] Mohod V, Kondwilkar B, Jadoun R. An institutional study of awareness of brain-death declaration among resident doctors for cadaver organ donation. Indian J Anaesth 2017; 61(12): 957-63. http://dx.doi.org/10.4103/ija.IJA_430_17 PMID: 29307900

[20] Abbasi Dolatabadi Z, Farahani B, Fesharaki M, Najafizadeh K. Effect of education about brain death and organ donation on attitude and knowledge of nursing students. Crit Care Nurse 2010; 3(3): 7-8.

[21] Manzari Z, Masoumian Hoseini ST, Karimi Moonaghi H, Behnam Vashani H. Effect of education based on nursing model of dynamism and continuous improvement in seeking assurance and getting approval on nurses' knowledge, attitude and practice about their role in organ donation process. J Mazandaran Univ Med Sci 2014; 24(119): 141-53.

[22] Marván ML, Orihuela-Cortés F. General Knowledge and Attitudes Toward Organ Donation in a Sample of Mexican Medical and Nursing Students. Rev Cienc Salud 2020; 18: 9-28.

[23] Almutairi S. Knowledge, attitude, and willingness towards organ donation among medical and health sciences students in Central Region, Saudi Arabia. Transpl Res Risk Manag 2020; 12: 23-8. http://dx.doi.org/10.2147/TRRM.S264872

[24] Alizadeh TB, Hasanzadeh F. Comparing attitudes of nursing students and students of Islamic sciences regarding organ donation after brain death in Mashhad in 2008. 2014.

[25] Chen JX, Zhang TM, Lim FL, *et al*. Current knowledge and attitudes about organ donation and transplantation among Chinese university students. Transplant Proc 2006; 38(9): 2761-5. http://dx.doi.org/10.1016/j.transproceed.2006.08.140 PMID: 17112824

[26] Amani F, Ghaffari Moghaddam M, Hossein Zadeh S, Farzaneh E, Valizadeh B. Attitude towards Ardabil's resident about organ transplantation in brain death. Iranian J Forensic Med 2015; 21(1): 7-12.