



Level of Knowledge and Attitude of ICU Nurses toward Organ Donation and the Related Factors: A Systematic Review

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ABSTRACT

Introduction: Nurses play a key role in the process of organ donation and transplantation, and previous studies have widely addressed the level of knowledge and attitude of intensive care unit (ICU) nurses in this regard. Considering the direct correlation between the positive attitude of the healthcare team, especially nurses, and the level of consent on organ donation, knowledge and attitude of nurses are important factors that have been assessed in several studies. However, no definite conclusions have been drawn in this regard. The present study aimed to evaluate the knowledge and attitude of ICU nurses toward organ donation and the related factors. **Methods:** A systematic review was conducted via searching in databases such as ProQuest, Medscape, MedlinePlus, MagIran, PubMed, and ScienceDirect to identify the articles published during 1990-2015 using keywords such as knowledge, attitude, organ donation, and nurses.

Result: Awareness and knowledge are the main determinants of attitude in nurses, which should be applied in order to foster positive attitudes in the process of organ donation. Furthermore, extensive clinical knowledge should be acquired on organ donation and communication skills by ICU nurses through proper training programs.

Conclusion: According to the results, using standard guidelines or scheduled training programs in nursing schools could improve the level of knowledge in nurses, which in turn enhances nursing performance. In addition, our findings indicated that positive attitude and knowledge of nurses could largely influence the viewpoint of families toward organ donation.

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Introduction

Organ and body tissue transplantation is an effective treatment for certain end-stage organ diseases, such as the liver, heart and lungs, which enhances the quality of life of patients (1,2). The need for organ transplantation has increased dramatically within the past 200 years. According to the statistics reported by the Organ Procurement and Transplantation Network (OPTN), more than 120,000 individuals are in the waiting lists of transplantation in the care centers across the world. This number increases by one individual per minute, 21 of

whom die every day (3,4).

Nurses play a key role in recognizing the potential organs for transplantation, obtaining the consent of families for organ transplantation, general training of the families, and performing effective nursing care (5). Today, nursing care in special units has been mainly focused on organ transplantation, which has changes the role of nurses as well (6). According to the literature, involvement of nurses in the process of organ transplantation is the most positive and rewarding part of this profession. Atti-

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tudes strongly affect various aspects of organ and tissue transplantation (7). In addition to general awareness, level of knowledge and attitudes of healthcare providers are of paramount importance in effective care (8). This is due to the key role of healthcare providers in different processes of organ and tissue donation, from recognizing the potential donor to the isolation of the donated organs and tissues. Among the other influential factors in the process of decision-making and participation of healthcare staff in organ donation are the accurate diagnosis of brain death, organ maintenance, and observance of the rules and regulations (9).

Fostering a positive attitude toward organ and tissue donation and declaring its effectiveness in the survival of patients and preventing disabilities could result in the motivation and positive work atmosphere among healthcare providers, thereby increasing the number of organ donors. Undoubtedly, this leads to better outcomes of the transplantation process and future planning in this regard (10).

In some cases, organ and tissue transplantation is the only option to save the life of a patient. Given the importance of nursing care in the process of organ transplantation and considering the results of the previous studies, an important issue to be addressed is the extent to which the level of knowledge and attitude in nurses affects the organ donation process, as well as the influential factors in this regard.

Several surveys have been conducted to evaluate the knowledge and attitude of nurses toward organ donation, endorsing the role of these healthcare professionals in the related decision-making and carrying out the process. In addition, considering the direct association between the positive attitudes of healthcare teams, especially nurses, and the level of consent on organ donation, the knowledge and attitude of nurses have been the most imperative subjects in this regard. Nevertheless, no definite conclusions have been drawn to address the stated issue.

The present study aimed to review the current literature on the knowledge and attitude of nurses toward organ donation and transplantation.

Methods

A systematic review was conducted to investigate the knowledge level and attitude of nurses toward the process of organ donation based on PRISMA guidelines for systematic reviews (11,12). In the first step, the research question was developed and formulized. After formulating the question and before beginning the study, any potential bias was removed by determining the inclusion and exclusion criteria of the study.

Inclusion criteria were as follows: 1) data ob-

tained from case studies, abstracts, or full-text articles; 2) study populations of ICU nurses (undergraduate or graduate); 3) articles published in English and 4) studies investigating the awareness and attitude of nurses toward organ donation. Exclusion criteria were review studies and letters to editor. After excluding 22,000 documents due to being repetitive in different sites, 500 articles due to inappropriate design, 450 articles due to considering other healthcare professionals than nurses, 15 non-English articles, 10 studies conducted on nursing students, and four qualitative studies, the remaining documents were collected and reviewed (Figure 1).

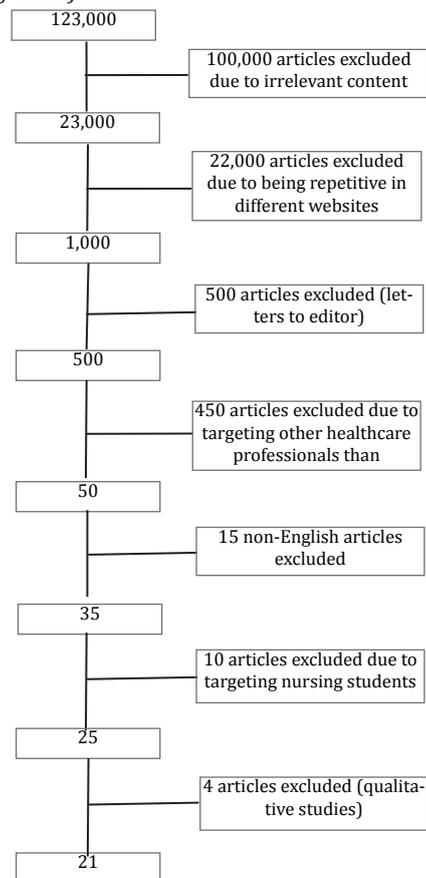


Figure 1. Strategies for inclusion and exclusion of articles

Literature review was initiated via searching in databases such as Web of Science, ProQuest, Medscape, MedlinePlus, Ovid, SID, MagIran, PubMed, Google Scholar, and ScienceDirect during 1990-2015 using keywords such as nurses, organ donation knowledge and attitude, nurse or nurses, knowledge, nurses' knowledge or nursing knowledge, attitude, nurses' attitude or nursing attitude, organ donation or organ donation process, transplant or transplantation, organ transplantation or tissue transplantation, and brain death by AND/OR operators in the title or abstract and alone or in combinations. Moreover, literature search was

Table 1. Findings of systematic literature review.

Author(s) Year Location	Type of Study	Number of Samples/ Characteristics of Samples	Methodology	Results
Kennedy H.B. Farrand L. (1996) United States	Descriptive	233 Emergency Service Nurses in 17 Hospitals	A questionnaire was used to investigate the attitude of nurses toward organ donation consisting of 57 items (e.g., demographic data) and multiple-choice questions scored based on Likert scale. Visual analogue scale was used to determine whether nurses should approach families of patients for donation.	Nurses had a positive attitude toward organ donation ($P<0.05$), while they had low self-confidence to ask questions about the process. A relationship was observed between the attitude of nurses and number the asked questions of the families about donation and self-confidence of nurses about the willingness of families for organ transplantation.
Rachmani R. (1999) Israel	Descriptive	59 Physicians 93 Nurses	A questionnaire with 24 items was used to evaluate the knowledge of forensic issues, religious issues, mental images, and procedural aspects in brain death diagnosis and assess the attitudes toward brain death, particularly in terms of behavioral codes and decisions.	Awareness of the participants toward brain death was low, so that 80% answered to less than five items. A significant association was observed between knowledge and attitude ($P<0.0001$). Only 39% of the participants were involved in the process of brain death diagnosis. A significant association was observed between knowledge and behavior ($P<0.0001$) and attitude and behavior ($P<0.004$).
Al-Mousawi M. Abdul-Razzak M. Samhan M. (2001) Kuwait	Descriptive	28 Anesthesiologists 51 Nurses in Seven ICUs	Two questionnaires were developed (one for physicians and the other for nurses) to determine the attitudes toward organ donation and transplantation, opinions about brain death and organ donation, and role of participants in requesting organ donation.	The results showed that 26 nurses believed in the concept of brain death (51%), eight nurses did not believe in the concept, seven cases uncertain, and only six nurses accentuated the importance of organ donation. In addition, 48 participants believed that the involvement of nurses is essential to successful organ donation. Five participants believed that nurses should not affect the decision of the families about organ donation, and eight participants stated that nurses should announce their personal views to the families. Only 14% were willing to persuade families for organ donation, and 67% of the nurses were not willing to accept brain death and organ donation. The results indicated that 49% of the nurses were uncertain about organ donation, and 59% believed that their religion does not allow them to do so. In conclusion, no positive attitudes were observed toward organ donation in Kuwait, which highlights the need for proper training programs.
Ozdog N. (2001) Turkey	Descriptive	474 Nurses in Three General Hospitals and Two Midwifery Centers	A questionnaire with 25 items (five demographic questions, 12 items on knowledge, four items on awareness, and four questions about willingness for organ donation) was used.	The results indicated that 87.7% of the nurses had positive awareness toward organ donation and transplantation ($P<0.05$), while only 10.8% were aware of the new rules and regulations. Additionally, 34.4% were willing to discuss and ask questions of the families of patients about organ donation. A significant association was observed between awareness and education level with willingness ($P<0.05$), acceptance ($P<0.01$), and participation in the organ donation process.
Ingram J.E. Buckner E.B. Rayburn A.B. (2002) United States	Descriptive	50 Neurological ICU Nurses in an Organ Transplantation Center 19 Surgical ICU Nurses in Private Hospitals	A standard questionnaire with 12 items (ODA-Q-II) and knowledge questionnaire were used to evaluate the attitudes toward organ donation.	The results showed that 96% of the nurses had a positive attitude toward organ donation, and 78.9% had adequate knowledge about the process.
Boey K.W. (2002) (Hong Kong, China)	Descriptive	314 Nurses in a Teaching Hospital (Center for Liver, Kidney, and Bone Morrow Transplantation) in Hong Kong	Attitude toward organ donation was assessed using a questionnaire with 46 items (ODAS) in three sections: ethical and humanitarian beliefs, fear of body dissolution, and fear of medical negligence. Commitment scale toward organ donation was used with six items.	The results indicated that 96% of the nurses had a positive attitude toward the ethical issues of organ donation, 24% had fear of body dissolution, and 15% were concerned about medical negligence. Also, 16% stated that they had committed for organ donation, while only 9% owned an organ donation card.

Author(s) Year Location	Type of Study	Number of Samples/ Characteristics of Samples	Methodology	Results
Kim J.R. Elliott D. Hyde C.H. (2003) Korea	Descriptive, Exploratory	Nine Individuals Selected from Three Organ Transplantation Hospitals (Head of the Team, a Surgeon, Three Coordinating Nurses, Two Head Nurses, ICU Director, and Two ICU Nurses)	Semi-Constructed Interviews	Knowledge of the personnel about organ donation was poor, while they had a negative attitude toward organ donation and did not accept brain death as actual death.
Reddy A.V.R. Guleria S. Khazanchi R.K. (2003) India	Descriptive	990 Individuals (300 Patients, 376 Citizens, 200 Physicians, and 97 Nurses)	A questionnaire was used consisting of three sections: awareness toward organ donation, willingness for organ donation, and attitude toward organ transplantation procedures.	The results indicated that more than 25% of the nurses believed that organ donation process is not part of their profession, and the majority of the nurses (58.5%) were uncertain about donating their relatives' organs.
Bøgh L. Madsen M. (2005) Denmark	Cross-sectional	1,168 Medical Staff (689 Individuals, 110 Physicians, 512 Nurses, and 61 Practical Nurses)	A questionnaire was used consisting of items about awareness, attitude, and performance in the organ donation process (mostly closed-ended questions and a few open-ended questions).	With regard to attitude, 82% of the participants endorsed organ donation. In addition, 94% of the participants were willing to donate their organs after death, and 81% of the nurses had a positive attitude toward organ donation. With regard to awareness, 54% of the participants were adequately aware of brain death to explain it to others, and 42% had adequate knowledge of communication with the families of dead patients. In addition, the results showed that the healthcare personnel needed more training programs, especially about the approaches of communicating with families about brain death, their support, and recognizing potential donors.
Conesa C. Ri'os A. Ramírez R. Sánchez J. Sánchez E. (2005) New York, U.S.A	Descriptive	139 Nurses in 32 Medical Care Centers	Attitude of nurses was evaluated using a questionnaire consisting of psychological factors, demographic information, awareness toward organ donation, and opinions about the body, corpus manipulation, and organ donation.	According to the results, 93% of the nurses had a positive attitude toward kidney donation. No significant relationship was observed between the attitude of nurses and transplantation of certain organs ($P=0.209$). Moreover, no significant association was observed between the attitude of nurses and organ donation from a dead body ($P=0.712$).
Kim J.R. Fisher M.J. Elliott D. (2006) Korea	Cross-sectional	520 Nurses in a Neurosurgical Department	A questionnaire with 38 items was used and scored based on a Likert scale, consisting of demographic information (age, gender, and marital status) and nursing experience.	According to the results, 89% of the participants received no training on the organ donation process. Despite divergent feelings, Korean nurses had a positive attitude toward the organ donation process. However, only 32% participated in the organ donation process, and 27% had prior experience of care provision for a brain-dead patient.
Cohen J. Ami S.B. Ashkenazi T. Singer P. (2008) Israel	Descriptive	2,366 Participants (1,737 Nurses and 629 Physicians in the ICU, Neurosurgery, Cardiology, Pediatrics, Anesthesia, and Internal Medicine Wards)	A demographic questionnaire was used consisting of data on age, gender, education level, hospital department, and attitude toward brain death (Does brain death confirm the death of the patient?) Level of difficulty was measured by performing duties such as coordinating the organ donation with a potential donor, describing the transplantation process, highlighting the importance of donation, and supporting families financially or spiritually. (Yes/No questions)	According to the results, 78.2% of the nurses had a positive attitude toward brain death ($P<0.001$). ICU nurses had a more positive attitude toward brain death compared to their peers in the emergency or internal medicine departments ($P<0.001$). Among those with positive attitudes, a significant relationship was observed between the necessity of following guidelines for confirming brain death, confronting the organ donation process in the hospital, and receiving training on brain death ($P<0.001$).
Manzari Z. Masoumian Hoseini S.T. Khaleghi I. (2015) Iran	Descriptive, Cross-sectional	90 ICU Nurses in Imam Reza and Qaem Hospitals of Mashhad City	A questionnaire was used consisting of demographic data and evaluation of the knowledge, attitude, and performance of nurses in the process of organ donation from brain-dead patients and the influential factors in this regard.	Nurses lacked the adequate knowledge and proper attitude and performance regarding the process of organ donation. In addition, 80% of the nurses had average knowledge about organ donation, and 97% had poor performance in this regard.

Author(s) Year Location	Type of Study	Number of Samples/ Characteristics of Samples	Methodology	Results
Melo J. Batista A. Teixeira A. Figueiredo E. Ribeiro O. Lopes P. (2011) Portugal	Prospective	495 Nurses and Physicians in the Emergency Service Department and ICU of Nine Hospitals	Transplantation questionnaire consisted of demographic variables, social variables, and professional data. Research units included nine questions. The second section contained general questions about the organ donation process and transplantation (12 items), and the third section contained 20 specific items about knowledge and awareness regarding the organ donation process.	According to the results, 78% of the nurses declared that they completed training courses on organ donation, and 67% believed that they needed more training in this regard. One of the most important causes of reduced organ donation could be the inability in diagnosing brain death and lack of adequate human resources. A correlation was observed between the lack of awareness toward organ donation, the entire process, and brain death criteria among the medical staff.
Jeon K.O. Kim B.N. Kim K.S. Byeon N.I. Hong J.J. Bae S.H. Son S.Y. (2012) Korea	Descriptive, Cross-sectional	109 Nurses and 61 Physicians in Five Hospitals	A questionnaire was used with 41 items about knowledge and 27 items about attitude.	There was a relationship between the level of personnel training and their knowledge about organ donation. A significant association was observed between the knowledge and attitude of personnel toward brain death and organ donation ($P<0.001$). A positive correlation was observed between the positive attitude toward organ donation and knowledge about the donation process ($P<0.001$). About 94.2% of the participants were aware of the death brain ($P=0.002$). In addition, 46.5% of the participants had prior experience of care provision for a brain-dead patient without knowing how long the patient could be alive ($P=0.037$). With respect to attitude, 74.1% believed that organ donation cannot be suggested to families, and 83.5% were willing to introduce families to organ donation hospitals. Demographic factors (age, gender, education level, professional status, and marital status) influenced the attitude toward brain death. Married, male, elder, and educated individuals had more positive attitudes toward organ donation ($P<0.001$). Given the importance of organ donation to 91.2% of the participants who believed that brain death could be a chance for organ donation, 83.5% had a positive attitude in this regard. On the other hand, there was a negative attitude toward communication with families about organ donation (27.6%), obtaining their consent for organ donation (27.1%), and registering for donation (12.4%).
Makara Studzińska A.M. Kowalska A. Wdowiak A. Kryś No-szczyk K. (2013) Poland	Prospective	100 Nurses in the Maternity Ward of the Orthopedic Clinic of Anesthesiology Surgery Department	A two-part questionnaire was used containing items about the knowledge and attitude of nurses toward organ donation and one item on variables such as age, gender, education level, and workplace.	The majority of the participants endorsed organ transplantation although they had inadequate knowledge about their effective role in the continuation of the process. Additionally, 72% of the nurses were not aware which types of brain death are recoverable in the organs.
Azmandian J. Poorhoseini S. Shokouhi M. Mirzaei M.R. (2013) Iran	Semi-experimental	120 Emergency Unit and ICU Nurses in a Hospital in Kerman	Researcher-Made Questionnaire.	Knowledge and attitude of the nurses toward organ donation and brain death increased following the training program ($P<0.001$).
Akgun H.S. Bilgin N. Tokalak I. (2003) Turkey	Descriptive-sectional	1,184 Participants (59% Nurses, 41% Physicians)	A questionnaire was used with 26 items, including demographic information, awareness, attitude, and beliefs about organ donation and brain death.	The results showed that 81.1% of the participants were aware of brain death criteria, while 58.9% lacked the awareness toward organ donation. Also, most of the participants had a negative attitude toward organ donation, and only 37.5% were willing to donate their organs.

Author(s) Year Location	Type of Study	Number of Samples/ Characteristics of Samples	Methodology	Results
Michael A.I. Ademola S.A. Olawoye O.A. Iyun A.O. Oluwatoshin O.M. (2014) Nigeria	Descriptive, Cross-sectional	80 Physicians 81 Nurses	A questionnaire was used with 44 items about attitude, which were scored based on a Likert scale in three sections: demographic and social variables, as well as a combination of multiple-choice questions and open-ended questions about the attitudes of physicians and nurses toward skin donation and organ donation bank.	According to the results, 96.9% of the participants were aware of the organ donation process. In 67.7%, the information was based on special trainings, and 49% of the individuals had a positive attitude toward organ donation. In contrast, 55.9% were not willing to participate in the discussion about skin transplantation, and 20.5% mentioned that undesirable deformity is their main reason for disagreeing with skin transplantation.
Lomero M.M. Rasero M.J. Fuentes L. Jaume M. (2015) Spain	Descriptive, Cross-sectional		A questionnaire was used with 36 items in three sections: items on the knowledge and attitude toward organ donation and demographic and professional variable.	According to the results, 74.4 % of the physicians and 69% of the nurses had a positive attitude toward organ donation. Moreover, 62.2% of the physicians and 32.4% of the nurses disagreed that brain death could be recognized by diagnostic tests (P<0.001). Regarding the reversibility of brain death, 91.1% of the physicians and 77.8% of the nurses disagreed (P=0.003).
Ríos A. Martínez-Alarcón A. Ayala M.A. Sebastián M.J. Abdo-Cuza A. Alán J. López-Navas A. López-López A. (2010) New York, U.S.A	Observational	1,194 Nurses in 12 Hospitals and 32 First-Aid Medical Care Centers in four countries (Spain: 650, Mexico: 428, Cuba: 89, and Costa Rica: 27)	A reliable questionnaire was used to assess the psychosocial aspects of organ donation, including demographic factors (age, gender, marital status, and country) and data on the profession, medical care center, and knowledge and attitude toward organ donation, personal experience about brain death, belief in the future needs for organ donation, attitude toward donating kidneys and liver, awareness about the brain death hypothesis, and attitudes of individuals toward the body.	According to the results, 77% of the nurses had a positive attitude toward brain death and organ donation.
Lin L.M. Lin C.C. Chen C.L. Lin C.C. (2014) Taiwan	Interventional	123 Individuals Working for a Minimum of Three Months in the ICU, General Surgery, Neurosurgery or Neurology Departments	The control group was provided with training booklets, which contained information on the necessity of organ donation, brain death process, organ donation process, forensic issues, experience of receiving organs, and donor families. In addition to the training booklet, the intervention group completed a training program based on the behavioral theory and using films about advancement in organ donation.	The training program (TPB) significantly changed the attitudes and behavioral attention of nurses toward the organ donation process (P<0.0).

resumed in the references of the selected articles (Table 1).

In total, 70,000 relevant articles were identified in Google search, including 50,000 articles in Google Scholar, 141 articles in PubMed, 905 articles in ScienceDirect, 1,900 articles in ProQuest, 39 articles in Medscape, three papers in MedlinePlus, two papers in Ovid, and 10 articles in MagIran. From 123,000 potential articles, 100,000 cases were excluded due to the irrelevant content.

The primary search targeted the articles that were published in English during 1990-2015 on the research subject using the mentioned keywords. In addition, the reference lists of the selected papers were searched, and we also searched for

unpublished studies through the available libraries of congresses and seminars, as well as the titles of research projects and those available in university websites via Scopus and IRANDOC. Additionally, we visited the the Cochrane Central Register of Controlled Trials and the Iranian Registry for Clinical Trials (IRCT) for relevant documents.

Required data were collected using a form that had been previously prepared by two of the researchers. Studies with similar titles and varied subjects were also excluded.

To evaluate each article, data abstractions were completed based on the RRISMA guidelines. Accordingly, two reviewers initially examined the titles of the selected articles independently based

on the provided abstracts and eliminated the irrelevant studies from further evaluation.

Relevant studies were selected based on the inclusion criteria of the study. Following that, the documents were independently examined and recorded by two reviewers. Moreover, quality of the selected studies was assessed using CONSORT (randomized clinical trials) and Oxford (analytical and descriptive studies). Finally, 21 articles were selected and approved for further evaluation.

Data extraction was performed after selecting the relevant documents. Extracted data from the papers were determined based on the survey questions in the data extraction form before the beginning of the study, including the names of the authors, titles, study objectives, location of the research, time of the study, type of the study, number and characteristics of the samples, and the final results. In the case of any arguments between the two reviewers, the disagreement would be resolved by a third reviewer.

Result

In total, 21 articles focusing on the attitude and knowledge of ICU nurses toward organ donation and the related factors were reviewed in the present study. Considering the differences in the findings of the selected studies, five articles generally claimed that the attitudes and knowledge of nurses toward the issue in question vary in different countries, while attitude and awareness in these healthcare professionals are affected by several factors (Table 1).

According to the findings, some of the main influential factors in this regard were the prior experience of care provision for an organ donation patient, education level, willingness, acceptance and participation in the process of organ donation, willingness toward explaining the brain death of a patient to the others, contact with the families of dead patients, receiving specific training on the criteria of brain death diagnosis, and positive attitudes of the others toward the process of organ donation (13-18). In contrast, some studies were indicative of the lack of knowledge in nurses in this regard, which could be attributed to the lack of training on the organ donation process, inefficiency in the diagnosis of brain death based on the standard criteria, and cognitive chaos toward the organ donation process and brain death (5,9,13-17).

In some of the selected articles, nurses were reported to have a positive attitude toward organ donation. These studies were mostly conducted in countries such as Israel, India, the United States, Poland, Turkey, China, and Spain. According to the findings, some of the main influential factors in

the positive attitude of nurses toward organ donation were the standard guidelines for the diagnosis of brain death in hospitals, guidelines for the ethical codes in hospitals, training programs for brain death and organ donation, self-confidence of nurses in facing the families of dead patients, enhancing the quality of life of patients, reducing medical expenses and psychological pressures of the families, prior experience of organ donation, higher education level and being married, religious beliefs, acceptance of brain death and the organ donation process, and personal willingness for organ donation (1,13-21).

On the other hand, other studies denoted the most important influential factors in the negative attitude of nurses toward organ donation to be the lack of training programs for determining the criteria of brain death and organ donation process, psychological factors (e.g., fear of organ incision), viewpoints of the patients' families, pain, uncertainty that brain death might not be an actual death, physical factors, burring and autopsy, reluctance to be part of the organ donation process and accepting it as a nursing duty, personal unwillingness to donate their own (or their family members') organs, lack of consent from the family of patients for organ donation, contradictory ideas about organ donation and transplantation, becoming sympathetically stressed, and becoming emotional when the donor is a close relative (5,11-18).

With respect to the effect of training on attitude, findings of the selected studies indicated that in the first years of clinical nursing practice, nurses with positive attitudes believe that the existing protocol used to explain brain death and give awareness to the families of organ donors could result in positive attitudes in this regard. Furthermore, most nurses confirmed the lack of adequate training and experience in supporting the families of dead patients (5).

Discussion

The present study aimed to review the current literature on the level of knowledge and attitudes of ICU nurses toward organ donation and the related factors. Considering the critical role of ICU nurses in the process of organ donation (recognizing the potential donors, supporting and approaching the families of dead patients), their attitude and knowledge is of paramount importance in the process of organ donation. Although the selected articles revealed that nurses have a positive attitude toward organ donation in general (1,13-21), special training programs are required to improve their level of awareness. Adequate knowledge could effectively change the attitudes and

improve the performance of nurses (13).

Training is considered to be the most important factor in changing the attitudes and performance of nurses toward organ donation. Using standard guidelines and scheduled training programs in nursing schools or offering related courses could also increase the awareness in nurses, thereby reinforcing their performance. According to the results of the present review, positive attitude and adequate knowledge of nurses could affect the attitude of the families of patients toward organ donation as well (4,8).

An important issue to be taken into account is that nurses may be involved with at least one element in the organ donation process (e.g., recognizing the potential donor and notifying the transplantation coordinator). Therefore, positive attitude of these healthcare professionals could remarkably affect notifying the transplantation coordinator, supporting the families of dead patients, and encouraging other individuals to participate in the process. Moreover, positive attitude helps nurses to control their negative feelings while explaining the organ donation process of a dead patient to the family, which paves the way for obtaining the consent of the families by establishing a connection (1,2).

According to some studies, nurses engaged in internal medicine wards or emergency sections are the main individuals who are responsible for recognizing potential donors. However, negative attitudes have been reported on behalf of these healthcare providers (13). Additionally, it has been confirmed that inexperienced healthcare personnel tend to have negative attitudes toward their experienced peers mostly due to the lack of exposure to brain death patients in nursing schools, which is of great importance regarding the outcomes of the organ donation process (14).

Studies have confirmed that the attitudes, beliefs, and behaviors of individuals are influenced by the cultural background, social norms, and religious beliefs. For instance, in South Korea and Turkey, people believe that corpus should be intact for burying, and therefore, they are likely to resist organ donation (9,15).

It has been endorsed that organ donors consider training to be more important than the care process, and the attitudes of individuals is known to enhance through proper training. Fostering a positive attitude in line with effective training is of paramount importance, especially for the healthcare providers who are involved in the care stage of the process. Given the importance of positive attitude in the organ donation process, some studies have accentuated that such positivism could be obtained by clarifying the concept of brain death.

In addition, since participation in this process may be an active decision concerning the attitudes of the individuals toward brain death, negative attitudes may lower participation (16,17).

According to the reviewed articles in the current research, awareness and knowledge are important factors in organ donation, which are largely influenced by social norms and religious beliefs. In this regard, awareness should be applied to create positive attitudes in the individuals who participate in the process of organ donation. Furthermore, extensive clinical knowledge is required on organ donation, and the communication skills of ICU nurses should also be reinforced through proper training programs (18). Adequate knowledge enables nurses to confidently communicate with the families of dead patients, and awareness could change their attitude and performance during this critical process.

One of the limitations of the current research was that some of the reviewed studies were conducted using qualitative methods, which were excluded despite their reliability and evidential consistency.

Conclusion

To the best of our knowledge, this is the first systematic review conducted in Iran to investigate the attitude and knowledge of ICU nurses toward the process of organ donation. Although several studies support the key role of nurses in the process of organ transplantation, further investigation is required in order to confirm this role. In this regard, proper training and standard guidelines are essential to helping nurses fulfill their duties. Nurses are irreplaceable members of healthcare teams; however, they mostly lack the necessary knowledge and awareness in the organ donation process. Therefore, it is recommended that evidence-based activities be carried out in order to enhance the nursing performance and contribute to the process of organ donation positively.

Implications for Nursing and Healthcare Policy

Positive attitude and knowledge of nurses could affect the viewpoint of the families of patients toward organ donation. Given the importance of nurses' awareness and attitude toward the organ donation process in different countries and considering the influential factors in this regard, it is suggested that interventions be conducted to enhance the awareness and attitude of nurses toward the organ donation process.

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Conflict of Interest

The authors declare no conflict of interest.

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