


## REVIEW ARTICLE

# Narrative review on attitudes toward organ donation of undergraduate nurse students

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## Funding information

Research Grant for Healthcare Professional from Kitasato University Hospital and Kitasato University East Hospital, Grant/Award Number: 2018-6

## Abstract

**Aim:** We aimed at obtaining suggestions to increase the number of organ donations by conducting a meta-analysis of researches on attitudes toward organ donation for nurse undergraduates around the world.

**Methods:** We looked for documents published by April 2017 using CINAHL, MEDLINE, Japan Medical Abstract Society, CiNii, and PsycINFO. We searched for English and Japanese literature including all terms of “attitude”, “students”, “nursing”, “Tissue and Organ Procurement”, “organ donation”. This study was carried out based on the Prisma Statement 2010.

**Results:** As a result of the search, six CINAHLs, 45 MEDLINEs, seven Japan Medical Abstract Society articles were extracted, but no papers from CiNii and PsycINFO. We extracted and analyzed 21 original papers including contents of organ donation, targeting nurse undergraduates, which also excluding scale development.

## KEYWORDS

attitude, narrative review, nurse undergraduates, nursing education, organ donation

## 1 | INTRODUCTION

In 2017, 1,742 kidney transplantations were performed in Japan, including 1,544 living and 198 nonliving kidney donations (cardiopulmonary arrest, 65 cases; brain death, 133 cases). That year, 12,499 patients were waiting for kidney transplantations. Because of the overwhelming lack of organs provided for this vast number of patients, living-donor transplantations now account for approximately 90% of cases. This organ shortage is a worldwide problem. In 2013, the number of brain dead organ donors per 100,000 people in the population was 35.1 people in Spain, 25.9 in the United States, 8.4 in South Korea, and 2.0 in Thailand. Thus, the number of donations greatly varies among countries. Japan has a very low number of organ donations worldwide, with only 0.6

brain dead organ donors per 100,000 people in the population (International Registry in Organ Donation and Transplantation, 2018). One reason for the donor shortage is that medical objectivity on determining brain death (Kleindienst, Haupt, & Hildebrandt, 1999) and perceptions and procedures for receiving and confirming consent of the patient and their family (Donatelli, Geocadin, & Williams, 2006) have become major problems in various countries worldwide. In such countries, organ donation may not sufficiently proceed because of cultural and social reasons. Moreover, in Japan, various attitudes focusing on views of life and death, including the concept of brain death, views on the body itself, and relationship with medicine, affect organ donation (Ikeguchi, 1998). Surveys have been globally conducted regarding attitudes toward organ donation. A study that targeted = Turkish university

students found that nursing students were more motivated to donate organs than other students (Kocaay et al., 2015). Studies that targeted nursing students have also been conducted in Japan, including an attitude survey on organ transplantation (Ishikawa et al., 2004) and a study clarifying the concept of death (Shirahama, 2002). Other studies have targeted the general hospital personnel (Yamashiki, Yamaoka, Kaido, & Uemoto, 2015) and health checkup center examinees (Kataoka, Odagaki, Hirano, Kamiya, & Okamoto, 2013). Although these studies have targeted a diverse range of subjects, to our knowledge, no reports exist based on systematic reviews. We believe that comparing factors related to attitudes toward organ donation based on existing reports can provide materials useful for investigating strategies to increase organ donations in Japan.

We outlined research regarding attitudes toward organ donation among nursing students worldwide who will be future nurses to gain hints on how to increase the number of organ donors.

## 2 | METHODS

### 2.1 | Search strategy

We used Igaku Chuo Zasshi, CiNii, CINAHL, MEDLINE (PubMed), and PsycINFO (ovid) databases to perform a literary search of reports published = from the start of database coverage to April 2017. We performed an “AND” search for all keywords of “organ and tissue procurement or organ donation,” “attitude,” and “student” among Japanese language reports. For English language reports, we conducted an “AND” search for all keywords of “tissue and organ procurement OR organ donation,” “attitude,” and “student.”

### 2.2 | Eligibility and ineligibility criteria

Eligibility criteria included the requirement of the term “nursing” in the title or abstract. Ineligibility criteria were non-original reports, reviews, minutes of meetings, reports that did not include content on organ donation, overlapping reports, reports that did not target nursing students, reports that aimed to develop a scale, and reports on other types of transplantations, living-donor transplantations, nursing curricula, and the concept of brain death.

### 2.3 | Selection of studies

The report searches were simultaneously conducted by two researchers to ensure reliability. The reports were selected by all joint researchers to make it possible to discuss the content of each report and guarantee literary quality.

## 2.4 | Abstraction and integration

For data abstraction and integration, primary materials targeted for analysis were scanned, and research methods, data, results, and findings were identified. The identified content was isolated from each report and integrated while comparing the points of similarity. We compared the Japanese, Western, and Asian nursing students with their non-nursing counterparts and critically investigated the points that have been revealed in previous studies.

## 3 | RESULTS

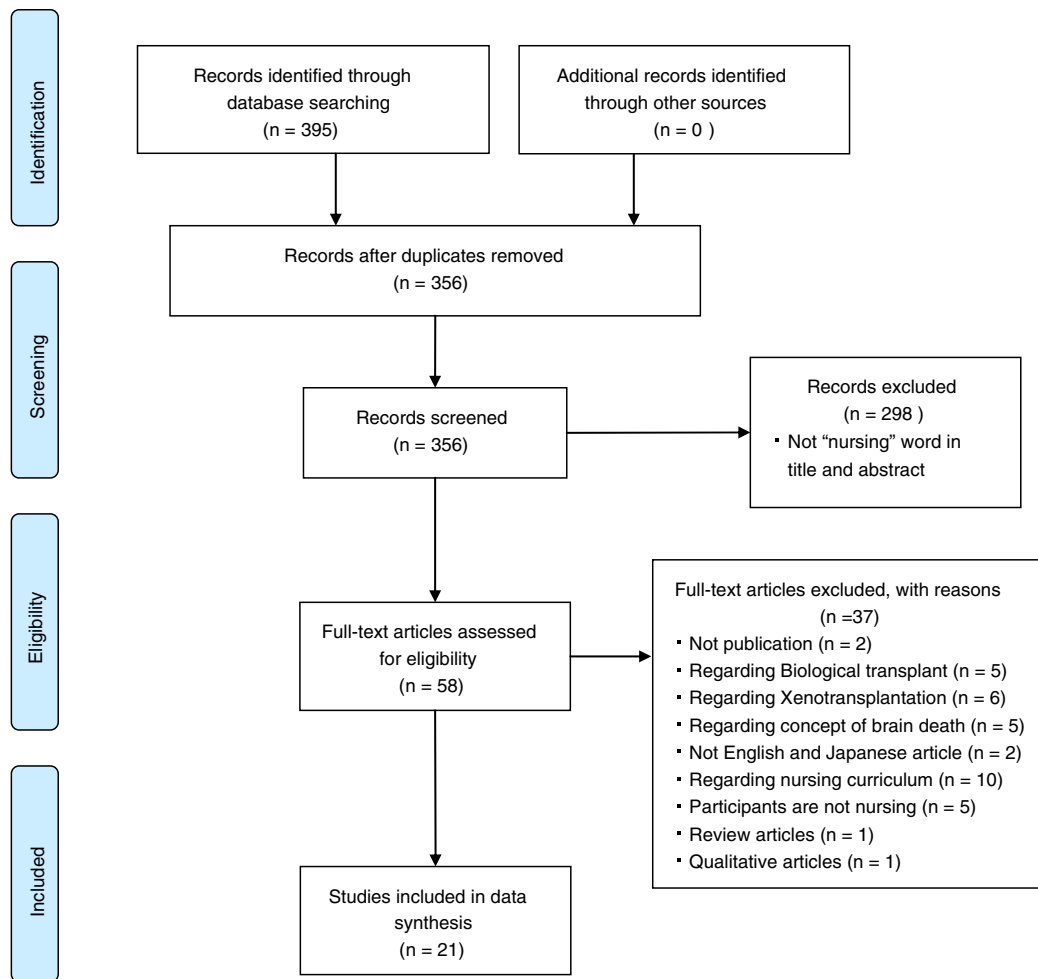
As a result of our search, we extracted six reports from CINAHL, 45 from MEDLINE, seven from Igaku Chuo Zasshi, 0 from CiNii, and 0 from PsycINFO databases. After exclusion criteria were applied, 21 reports were available for analysis. Figure 1 shows the process for identifying reports.

### 3.1 | Comparison by publication year and country

The publication year of the target reports was 1990s for one report, 2000s for 10, and 2010s for 10. The publication country was Poland for two reports; the United Kingdom for two; and the United States, Spain, Italy, Turkey, Greece, South Korea, Saudi Arabia, Hong Kong, and Malaysia for one report each. Eight reports were published in Japanese within Japan.

### 3.2 | Research methods for extracted reports

All 21 reports involved studies with a cross-sectional research design. Self-administered questionnaires were used for data collection. Many scales used had been constructed by the researchers based on past reports. Existing scales were used in five reports, including the PCID-DTO Rios (two reports; Poland), Organ Donation Attitude Survey (ODAS; one report; Italy), brain death and organ donation – knowledge and attitudes (KA-BDOD; one report; South Korea), and Organ Donor Attitude Questionnaire II-Student Version (ODAQ II-SV; one report; United States). Many reports focused on identifying factors that affected students' attitudes on and knowledge regarding organ donation through analysis based on the evaluation of the motivation, attitudes, and knowledge of organ donation in nursing students compared with students from other faculties and departments. Meanwhile, a small number of studies focused on regional disparities in motivation for and knowledge of organ donation. Table 1 shows an outline of the target reports.



**FIGURE 1** Process of studies selection

### 3.3 | Attitudes toward organ donation in Japan

All eight Japanese language reports involving studies investigating the attitudes of nursing students toward organ donation were comparative studies using questionnaire surveys. Some studies also made comparisons with non-nursing students, including humanities and welfare students, general members of the society (who is not involved in medical), junior high school students, or parents. Other studies compared undergraduate nursing, postgraduate nursing, and nursing college students (Ishikawa et al., 2004; Nakayama et al., 2002; Saita et al., 2006; Takahashi et al., 2000; Tsubaki, Irie & Konishi, 2017). Ishikawa et al. (2004) compared students who had and had not received undergraduate nursing education and found that the former had more positive views on organ transplantation. Hatakeyama and Kobayashi (2005) investigated interest regarding organ transplantation and found that student groups with greater interest were significantly more likely to respond that they intended to donate organs. Nakayama et al. (2002) investigated reasons for nursing students carrying donor cards

and found that a significantly common response was “because I am interested in this issue.” Tsubaki, Irie et al. (2017) also reported that health science students were significantly more likely to carry a donor card than non-health science students.

Comparing views on life and death, significant differences were found in the numbers of individuals who do or do not want to donate in a state of cardiopulmonary arrest. Thus, an issue for the future is conducting an analysis based on views of life and death and the concept of death (Hatakeyama & Kobayashi, 2005). Shirahama (2002) investigated the concept of death and intention to donate organs and found no difference regarding program year, suggesting that factors greater than educational curricula were involved in the formation of a concept of death. In addition, student groups that considered brain death to indicate human death had significantly stronger intentions to donate organs once in a state of brain death and significantly fewer intentions to donate while alive or after cardiac death than student groups. Saita et al. (2006) investigated factors related to the acceptance or rejection of brain death as human death and reported that the group that rejected brain death exhibited high scores for animism, Buddhist ideas, and

**TABLE 1** Characteristics of studies for research targeted at the confirmation of intention for organ donation

Title	Author (year)	Country	Purpose	Measurement	Outcomes
Brain death and organ donation knowledge, awareness, and attitudes of medical, law, divinity, nursing, and communication students	Kocaay et al. (2015)	Turkey	The aim of the present study was to assess the level of knowledge, awareness, and attitudes of medical, law, divinity, nursing, and communication students, who will serve in this capacity in the future, regarding brain death and organ donation.	Data were collected with the use of an anonymous 30-item questionnaire.	Willingness to donate organs, 51.3% of the participants reported that they would donate their own organs after death. Only 2% of all students and 4% of who expressed willingness to donate their organs had an organ donation card
English nursing and medical students' attitudes toward organ donation	Cantwell and Clifford (2000)	UK	The aims of the study were to determine and compare the attitudes held by nursing and medical students to organ and corneal donation, determine and compare the commitment held by nursing and medical students to donate organs personally.	Structured questionnaire previously used by Kent and Owens in 1995	There was a weak but significant correlation between an individual's attitude toward organ donation, and their willingness to personally donate organs.
Factors affecting attitude toward organ donation among nursing students in Warsaw, Poland	Mikla, Rios, Lopez-Navas & Gotlib et al. (2015)	Poland	The objective of this study was to analyze the attitude of nursing students at the Medical University of Warsaw in the center of Poland toward organ donation and determine the factors that affect this attitude.	PCID-ODT Rios.	Attitude toward the organ donation and transplantation (ODT) between nursing students was favorable in 69%, 25% were undecided, and 6% had an unfavorable opinion. Students who had a correct knowledge of the concept of brain death also showed a more favorable attitude toward ODT.
Factors associated with medical and nursing students' willingness to donate organs	Tumin et al. (2016)	Malaysia	This study investigates medical and nursing students' willingness to donate organs upon death and the factors influencing their willingness.	Experts in social science and medicine collaborated to produce a self-administrated questionnaire on the light of previous studies on organ donation.	Medical students were 2.5 times more willing to donate than nursing students. Respondents having a family member who has a donor card were 3.5 times more willing to donate than their counterparts.

(Continues)

TABLE 1 (Continued)

Title	Author (year)	Country	Purpose	Measurement	Outcomes
Knowledge, attitudes and commitment toward organ donation among nursing students in Hong Kong	Tam, Suen, and Chan (2012)	Hong Kong	The current study aims to identify the knowledge level, attitude, and commitment toward organ donation among nursing students in a local university.	A questionnaire was developed based on previous study.	A total of 362 questionnaires were collected—272 (75.1%) from the undergraduate program and 90 (24.9%) from the preregistration Masters program. Year of study and attitude score toward organ donation are significantly associated with the commitment to organ donation.
Organ donation knowledge and attitudes among health science students in Greece: Emerging interprofessional needs	Symvoulakis et al. (2014)	Greece	To report on the knowledge, attitudes and concerns of undergraduate students, enrolled in three health science disciplines, in regard to organ donation and presumed consent.	The questionnaire comprised of 21 items, grouped in three main domains: knowledge, general attitudes to kidney donation, and specific concerns.	Only 3.6% of NS, 8.7% of MS and 3.2% of MLS carried a donor card. Although over 78% in all groups knew that it was possible to leave kidneys for transplant after death.
Organ donation: What are the opinions of nursing students at the University of Bialystok in Poland?	Mikla, Rios, and Navas (2016)	Poland	The objective of this study was to analyze the attitudes of nursing students toward ODT, and to determine the factors that affect them.	PCID-ODT Rios.	Not knowing any donor. Being in favor of organ donation by a relative.
Pro-donation behaviors of nursing students from the four countries of the UK	McGlade, McClenahan, and Pierscionek (2014)	UK	This study aimed to examine the knowledge and attitudes of student nurses, whether these were worthy of further investigation that could lead to an eventual improvement in donation rates across the UK.	The questionnaire was developed and pilot-tested using a framework based on the topics investigated in previously published studies.	Almost half of the participants were registered as organ donors: 46.8%. Corneal tissue was found to be the least likely to be donated. For all other organs, willingness to donate was expressed by over 90% of the participants. The organs that participants were most willing to donate were the kidneys.

(Continues)

**TABLE 1** (Continued)

Title	Author (year)	Country	Purpose	Measurement	Outcomes
Saudi nursing and medical students' knowledge and attitudes toward organ donation- A comparative cross-sectional study	Majeed (2016)	Saudi Arabia	The aim of this study was to compare prevailing knowledge and attitude of undergraduate female Saudi nursing and medical students toward organ donation.	This comparative cross-sectional study used a structured questionnaire developed by the author based on information in the available national and international literature.	In knowledge-based questions, there is significant better knowledge of medical groups in eight items and by nursing groups in one item. Possible source of knowledge was depicted in figure 2. Major source of knowledge was media (65.2%) for nursing group and college/university (50.8%) for medical group.
Undergraduate nursing students' attitudes toward organ donation: a survey in an Italian university	Zampieron, Corso, and Frigo (2010)	Italy	To examine undergraduate nursing students' attitudes toward organ donation and to determine whether or not attitudes were related to the students' education and training.	Students completed a self-administered quantitative questionnaire with 61 questions.	Some students stated that genitals, brain, bones, skin, face, limbs, eyes, corneas, intestine, lungs, heart and spleen were organs that they would refuse to give. Many students did not agree with Italian legislation that permits organ use in cases where there is not an explicit refusal of donation.
Undergraduate nursing students' knowledge and attitudes toward organ donation in Korea: Implications for education	Kim, Fisher, and Elliott (2006)	Korea	The aims of this survey of undergraduate nursing students were to identify nursing students' knowledge levels and their attitudes toward brain death and organ transplantation and examine the construct validity of the newly developed instrument.	The instrument was initially developed by the researchers to assess knowledge and attitude toward brain death and organ donation (KA-BDOD).	There was a general lack of knowledge regarding diagnostic tests and co-morbid factors of brain death among undergraduate nursing students. Personal attitudes and nursing practice regarding brain death and organ transplantation clustered to four components as a result of the principal component analysis.

(Continues)

**TABLE 1** (Continued)

Title	Author (year)	Country	Purpose	Measurement	Outcomes
Attitudes of upper division nursing students toward organ donation	Riffell and Stoeckle (1998)	USA	The purpose of this descriptive, correlational study was to investigate the attitudes of upper division baccalaureate (BSN) nursing students toward organ donation.	ODAQ II-SV.	When asked what influenced their attitudes, the majority of students (67.8%) “agree” to “strongly agree” that increased knowledge was most influential. However, there was not a statistically significant relationship between knowledge level concerning organ donation and attitudes of senior BSN students.
Do nursing students understand the meaning of brain death?	Martínez-Alarcón et al. (2009)	Spain	The authors sought to determine the knowledge of nursing students about the concept of brain death.	The questionnaire was completed anonymously and self-administered. Opinions were evaluated using a survey of psychosocial aspects validated in the workplace.	A total of 70% of students stated that they knew the correct concept of brain death; 27% had doubts about the matter; and 3% believed that a person with brain death can recover to lead a normal life.
Attitude toward brain death and organ transplantation – A comparative survey of nursing college students and their parents, nursing university students, junior high school students and teachers	Ishikawa et al. (2004)	Japan	Compare attitudes toward brain death and organ transplantation among nursing students and their parents, and junior high school students and their teachers.	Self-administered questionnaires by choosing either 2 or 3 by reference.	Sophomore nursing students with one year preparation in basic work is higher than nursing college first grader. Acceptance degree that “brain death is death of people”, ownership rate of “organ donation decision card”, willing to donate organs.
Nursing students' views of death and willingness of organ donation	Shirahama (2002)	Japan	Explore nursing students' views of death and willingness to donate organ.	Questionnaire created by the author referring to the survey form in the sociology field and the opinion survey of the newspaper.	In the student group in which brain death is death of a person, the willingness to donate organs from the state of brain death is significantly higher, and the willingness to donate after survival and cardiac death is significantly lower.

(Continues)



**TABLE 1** (Continued)

Title	Author (year)	Country	Purpose	Measurement	Outcomes
Survey on the awareness of ODT among nursing students	Hatakeyama and Kobayashi (2005)	Japan	Study of relationship between view of life and death with attitude toward organ transplant and ownership of organ donation decision cards.	In registered items on organ transplantation and DAI (death attitude inventory) as a two-choice method with self-administered questionnaires.	There was a significantly higher intention of “offering” to students who do not have a group of students interested in organ transplantation. In comparison with the perspective of life and death, significant differences were seen in “I want to provide it at the time of cardiac arrest,” “I do not want to provide at cardiac arrest”.
Changes in consciousness concerning organ transplantation from brain-dead people of nursing students 5 years ago and now	Kondo and Minami (2005)	Japan	Make it a material to be taught about human life and death.	Questionnaire on “brain death and organ transplant”. What this is obtained by modifying a part of the research content of public opinion committee of 1991	None
People's perceptions on organ transplantation and human death using a religious factor scale for view of death and life	Saita, Sasaki, Okate, Sato, and Azuma (2006)	Japan	Identify factors related to people's brain death and perception of organ transplants and acceptance / denial of brain death.	Questions related to approval / disapproval of brain death / organ transplantation were created based on public opinion survey. Knowledge of brain death is created based on brain death judgment standard. A view on life and death uses a religious element scale.	Knowledge scores for brain death were significantly higher for nursing students and general citizens than for literature students. The view of death and life in the acceptance group / denial group of “death of brain death” was a factor of animism, Buddhist thought, Confucian thought, and the negative group were significantly higher.
Awareness survey of brain death and organ transplantation: Comparison of awareness between nursing junior college students in 1991 and nursing college students in 1999	Takahashi, Minami, Iwamoto, and Kondou (2000)	Japan	To clarify the awareness of death and evaluate support methods for cultivation of the life and death view in student nursing.	Questionnaire on “brain death and organ transplant”. What this is obtained by modifying a part of the research content of public opinion committee of 1991	Compared with college students, university students had differences such as anxiety about brain death determination and unethical medical ethics.

(Continues)



**TABLE 1** (Continued)

Title	Author (year)	Country	Purpose	Measurement	Outcomes
Evaluation of effect of education about a donor card on university or college students	Nakayama, Oota, Isshiki, & Mori (2002)	Japan	The purpose of this study was to evaluate effects of education about a donor card on college students.	Author created a questionnaire on the status of organ transplantation medical treatment. This includes awareness, knowledge, purpose, destination, reason for possession, feeling, about donor cards.	It is suggested that education on donor card is not only awareness of knowledge but also motivation of action, it is thought to be useful for spreading awareness of donor card.
Present condition and opinion poll on donor cards and organ transplantation for students — A comparison of influence by faculty	Tsubaki, Irie et al. (2017)	Japan	Compare the difference in recognition of donor cards and organ transplants among college students of “medical” and “non-medical” and consider factors that hinder the spread of donor cards.	Created based on existing questionnaire contents. It is content of questions divided into three elements of knowledge, attitude and action.	Students of “medical” had a significantly higher ownership rate of donor cards compared with “non-medical” students.

Abbreviations: MN, medical students; MLS, medical laboratory students; NS, nursing students.

Confucian ideas. Nursing students had significantly greater knowledge regarding brain death than humanities students.

A study comparing nursing students in 2005 and 2000 indicated that while few subjects had positive views on brain death or organ transplantation, they conversely had a positive stance on organ transplantation by themselves personally (Kondo & Minami, 2005). Another report that analyzed nursing students at different time frames compared nursing college students in 1991 with university nursing students in 1999 and revealed an ambivalent reaction; the university students were confused about brain death, stating that they “were not sure” about accepting it while promoting organ transplantation (Takahashi et al., 2000).

### 3.4 | Factors related to attitudes on organ donation

Several factors correlated with attitudes toward organ donation (Table 2), including some related to positive and negative attitudes toward organ donation. Some reports also indicated significant relationships with age and religion (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015; Mikla et al., 2016) and some found no such relationship (Riffell & Stoeckle, 1998; Tumin et al., 2016; Zampieron et al., 2010).

Studies investigating the attitudes of undergraduate nursing students toward organ donation have been conducted outside of Japan in Europe, America, and regions in Asia.

We summarized results on attitudes toward organ donation by region.

#### 3.4.1 | Reports regarding attitudes on organ donation in Europe and America

In Europe and America, eight reports were from six countries (United Kingdom, Poland, Greece, Italy, Spain, and United States), including two reports comparing attitudes toward organ donation of nursing and medical students (Cantwell & Clifford, 2000; Symvoulakis et al., 2014). Cantwell and Clifford (2000) reported no significant differences in the total scores for attitudes toward organ donation among nursing and medical student groups. However, they reported that a significantly higher number of nursing students carried a donor card than medical students. Symvoulakis et al. (2014) found that medical students were more likely to carry a donor card than nursing students (Martínez-Alarcón et al., 2009; Riffell & Stoeckle, 1998). Riffell & Stoeckle (1998) found no significant correlation between the level of knowledge and attitude toward organ donation. Martínez-Alarcón et al. (2009) reported that while final year students had superior knowledge related to transplantation than first-year students, no correlation was noted with attitudes toward transplantation. Four reports described factors related to attitudes toward organ donation (McGlade et al., 2014; Mikla, Rios, Lopez-Navas & Gotlib et al., 2015; Mikla et al., 2016; Zampieron et al., 2010). Table 2 shows factors related to attitudes toward organ

**TABLE 2** Items related to the attitudes toward organ transplant

Items related to the attitude of organ donation
Having a family member with a donor card (Tumin et al., 2016)
Believing that religion permits organ donation (Tumin et al., 2016)
The commitment of organ donation measured using the registration status (Tam et al., 2012)
Fear of death (McGlade et al., 2014)
Being in favor of donating the organs of a relative (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015)
Commenting with the family (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015)
Favorable opinion toward the donation of the father, mother and partner (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015; Mikla et al., 2016)
Being a regular blood donor (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015)
The body stands out regarding mutilation and/or scarring (Kim et al., 2006; Mikla, Rios, Lopez-Navas & Gotlib et al., 2015; Mikla et al., 2016)
Accepting incineration, burial, and autopsy (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015)
Age (Mikla, Rios, Lopez-Navas & Gotlib et al., 2015)
Ethnicity (Tumin et al., 2016)
Year of study (Mikla et al., 2016; Tam et al., 2012)
Opposition to a system that would make it lawful to take kidneys from an adult who has just died
Religion (Mikla et al., 2016; Tam et al., 2012)
Not knowing any donor (Mikla et al., 2015; Mikla et al., 2016)
Being in favor of organ donation by a relative (Mikla et al., 2016)
Accepting autopsy after death (Mikla et al., 2016)
Discussing the topic with friends (Mikla et al., 2016)
Birthplace (McGlade et al., 2014)
Retrieving organs when heart beats remain was a violation of a patient's rights (Kim et al., 2006)
Expressed fear of accepting brain death due to misdiagnosis (Kim et al., 2006)
Residency (McGlade et al., 2014)
Interest in organ donation (Nakayama et al., 2002)
Concerns of medical distrust (McGlade et al., 2014)
Items that are not related to the attitude of organ donation
Gender (Tumin et al., 2016; Tam et al., 2012; Zampieron et al., 2010; Riffell & Stoeckle, 1998)
Age (Riffell & Stoeckle, 1998; Tam et al., 2012; Tumin et al., 2016; Zampieron et al., 2010)
Parents' religion (Tam et al., 2012)
Religion professed (Mikla et al., 2015; Riffell & Stoeckle, 1998)
Education level (Tam et al., 2012)
Knowledge level concerning organ donation (Riffell & Stoeckle, 1998; Tam et al., 2012)
Clinical practice in hospitals with a transplant unit (Zampieron et al., 2010)
Nursing care to patients waiting for a transplant or dialysis patients (Zampieron et al., 2010)
Marital status (Riffell & Stoeckle, 1998)
Study program Tam et al., 2012)

donation. Mikla et al. (2016) reported that “Being in the 1st year,” “Not knowing any donor,” “Being in favor of organ donation by a relative,” “Discussing the topic with friends,” “Not worried about the possible mutilation of the body after donation,” “Favorable attitude toward the Organ Donation Transplantation of mother,” “Accepting autopsy after death,” and “Professing the Catholic religion” were significantly related to attitudes toward organ donation. Zampieron et al.

(2010) found that “Gender,” “Age,” “Clinical practice in hospitals with a transplant unit,” and “Nursing care to patients waiting for a transplant or dialysis patients” did not significantly correlate with attitudes toward organ donation. McGlade et al. (2014) reported that donor card registration differed as a result of factors, including “Birthplace,” “Residency,” “Fear of death,” and “Concerns of medical distrust.” Mikla et al. (2015) also reported that “Age,” “Talk

about donation and transplantation,” “Being in favor of donating the organs of a relative,” “Commenting with family,” “Commenting with friends,” “Favorable opinion toward the donation of the father, mother, and partner,” “Express the possibility of needing a transplant,” and “Being a regular blood donor” significantly correlated with positive attitudes toward organ donation.

### 3.4.2 | Reports regarding attitudes toward organ donation in Asia

In Asia, there were five reports from five countries (Turkey, Malaysia, Hong Kong, Saudi Arabia, and South Korea). One report compared the attitudes toward organ donation of nursing and medical students in this region (Majeed, 2016). Majeed (2016) reported that although nursing students had less knowledge regarding organ donation than medical students, they had positive attitudes toward organ donation. Kim et al. (2006) asserted that nursing students' knowledge on transplantation was lacking in terms of diagnosing brain death and understanding complications. Factors correlating with attitudes toward organ donation were cited in two reports (Tam et al., 2012; Tumin et al., 2016). Tam et al. (2012) reported that “Year of study,” “Religion,” “Attitude toward organ donation,” and “Study program” significantly correlated with registering their consent to organ donation. Meanwhile, no significant correlations were noted for “Age,” “Gender,” “Parent's religion,” “Education level,” or “Knowledge score toward organ donation.” Tumin et al. (2016) reported that “Ethnicity,” “Profession,” “Household income,” “Having a family member with a donor card,” and “Believing that religion permits organ donation” significantly correlated with motivation to donate organs after death. However, they reported that “gender” did not correlate with motivation for organ donation. Kocaay et al. (2015) found that although subjects were relatively positive regarding organ donation by themselves, they had negative attitudes regarding organ donation by family members.

### 3.5 | Proportion of subjects with intention to donate own organs after death

By region, there are three reports in North America. A total of 547 people (69.0%) in the survey by Mikla, Rios, Lopez-Navas & Gotlib et al. (2015) in Poland, 312 people (46.8%) in the survey by McGlade et al. (2014) in the UK, and 26 people (74.0%) in the survey by Cantwell and Clifford (2000) in the UK answered that they had intention to provide their organs after death. There are six reports in Asia; 231 people (68.5%) in the survey by Tsubaki, Irie et al. (2017) in Japan, 278 people (55.6%) in the survey by Tumin et al. (2016) in Malaysia, 22 people (66.7%) in the survey by Kocaay et al.

(2015) in Turkey, 147 people (40.6%) in the survey by Tam et al. (2012) in Hong Kong, 168 people (63.1%) in the survey by Hatakeyama and Kobayashi (2005) in Japan, and 36 people (45.6%) in the survey by Ishikawa et al. (2004) in Japan responded that they intend to provide their organs after death. No regional trends were noted in the intentions to donate one's own organs after death. Results for responses are shown in Table 3.

## 4 | DISCUSSION

### 4.1 | Effects of undergraduate nursing education on attitudes toward organ transplantation

#### 4.1.1 | Undergraduate nursing education and attitudes toward organ transplantation in Japan

In Japan, Hatakeyama and Kobayashi (2005) found that student groups interested in organ transplantation had significantly higher intentions to donate organs. Nakayama et al. (2002) investigated reasons for nursing students carrying donor cards and found that a significantly common response was “because I am interested in this issue.” Thus, it appears important to be interested in the topic of organ donation. A study (Ishikawa et al., 2004) which compared nursing students with other subjects found that a larger proportion of students who underwent undergraduate nursing education had a positive opinion regarding organ donation than those who did not undergo such education. Tsubaki, Irie et al., (2017) compared proportions of university students in health science and non-health science programs who carried donor cards and found that health science students were more likely to carry such cards. Thus, it appears that education related to health care, including undergraduate nursing education, affects positive attitudes toward organ donation. In Japan, Hatakeyama and Kobayashi (2005) reported that undergraduate nursing education and nursing practical training in various fields provide opportunities to review one's life through involvement in the death of familiar patients. Students may also consider issues related to organ donation in lectures on topics, such as nursing ethics, bioethics, and views on life and death. These experiences of undergraduate nursing education in Japan were factors that positively affected attitudes toward organ donation.

#### 4.1.2 | Undergraduate nursing education and attitudes toward organ transplantation in Europe and America

While no studies in Europe and America compared nursing and non-medical students, the following two reports did:

**TABLE 3** Comparison of willingness to donate organs

Title	Country (year)	Participants	Percentage of respondents to provide their organs after death
Brain death and organ donation knowledge, awareness, and attitudes of medical, law, divinity, nursing, and communication students	Turkey (2015)	33 nursing students	66.7%
English nursing and medical students' attitudes toward organ donation	UK (2000)	35 nursing students	74% (sign a donor cards)
Factors affecting attitudes toward organ donation among nursing students in Warsaw, Poland	Poland (2015)	793 nursing students	69.0%
Factors associated with medical and nursing students' willingness to donate organs	Malaysia (2016)	264 medical students, 236 nursing students	55.6%
Knowledge, attitudes and commitment toward organ donation among nursing students in Hong Kong	Hong Kong (2012)	362 nursing student (undergraduates: 272, master: 90)	40.6%
Pro-donation behaviors of nursing students from the four countries of the UK	UK (2014)	667 nursing students	46.8% (sign a donor cards)
Attitudes toward brain death and organ transplantation	Japan (2004)	79 nursing students	45.6%
Survey on the awareness of ODT among nursing students	Japan (2005)	267 nursing students	63.1%
Present condition and opinion poll on donor cards and organ transplantation for students - A comparison of influence by faculty	Japan (2017)	338 nursing students	68.5%

Cantwell and Clifford (2000) from the United Kingdom reported no significant differences in total scores for attitudes toward organ donation among nursing and medical student groups. However, they reported that nursing students were more likely to carry a donor card. Symvoulakis et al. (2014) found that medical students were more likely to carry a donor card than nursing students. While neither report found that nursing or medical education affected attitudes toward organ donation, the results suggested that nursing and medical education affected the proportion of individuals who carry donor cards. Thus, the results could be used to investigate strategies for promoting the popularity of donor cards. In the United Kingdom, nursing education reform may have been responsible for results indicating that nursing students were more likely to carry a donor card than medical students. To facilitate the provision of high-quality nursing education in response to changing societal needs, Project 2000 has been successively implemented since 1990, which is based on the concept that university-level nursing education is a requirement. In 2000, the country was using an opt-in system, like in Japan, whereby organ donation required either the consent of the patient's family or the patient having made their intent to donate clear while still alive. However, in 2015, Wales adopted an opt-out system in an attempt to eliminate organ shortage. Under this system, subjects are considered to have provided consent unless they explicitly state, while alive, that they refuse to donate their organs. Nursing education

responding to such social changes could result in increased proportions of nursing students carrying donor cards.

Riffell and Stoeckle (1998) reported that the level of knowledge was not significantly related to attitudes toward organ donation. Martínez-Alarcón et al. (2009) found that while final year students had superior knowledge related to transplantation than first-year students, no correlation was noted with attitudes toward transplantation, which suggests that improving knowledge alone is not enough to alter attitudes toward organ donation.

Thus, in Europe and America, it appears that rather than education that improves knowledge, enhancing the educational environment to reflect the social situation leads to a greater interest in organ donation and encourages more people to carry donor cards.

#### 4.1.3 | Undergraduate nursing education and attitudes toward organ transplantation in Asia

Of the reports analyzed in this study, one by Kocaay et al. (2015) targeted not only nursing and medical students but also law and theology students in its comparative investigation. This report found that in terms of attitudes toward organ donation, 51.3% of subjects indicated that they would donate their own organs after death but that nursing and medical students had more positive attitudes than theology students. This demonstrated that attitudes on organ donation

differ between students in a health science course, such as nursing or medicine, and those majoring in religious studies, such as theology.

Majeed (2016) reported that while nursing students had less knowledge on organ donation than medical students, they had positive attitudes regarding the donation of their organs. While it appears that there is no correlation between knowledge and organ donation, Tam et al. (2012) reported that “Year of study,” “Religion,” “Attitude toward organ donation,” and “Study program” significantly correlated with declaring intent regarding donation. These findings suggested that outside of individual religious views, factors related to experience, such as which “Study program” to undergo and whether to undergo continued education, were more likely to lead to accepting attitudes toward organ donation than education aiming to increase knowledge.

## 4.2 | Factors related to attitudes toward organ donation

Several factors were found to be related to attitudes toward organ donation. One typical such factor was the opinions of family members. “Favorable opinion toward the donation of the father, mother, and partner,” “Having a family member with a donor card,” “Being in favor of donating the organs of a relative,” and “Commenting with family” were cited as significantly related factors. Opinions of family members affected the intentions of subjects on whether they would donate organs. A study conducted in Japan on organ donation and families found that one reason for not carrying a donor card was family opposition. Results showed that there was less desire for family members to donate organs either during brain death or cardiac death than to donate organs themselves (Tsubaki, Irie et al., 2017). A similar report by researchers in Turkey found that despite positive attitudes on their own organ donation, subjects had significantly negative attitudes regarding donation of organs by their family members (Kocaay et al., 2015). It appears that family attitudes are related to attitudes toward organ donation and that people often have more negative attitudes toward organ donation by their family members than donation of their own organs. A study that retrospectively analyzed the background factors related to family proxy decision-making on organ donation found that when the decision was left up to family members, the wishes of the deceased were respected (Tsubaki, Geshi, Ttakahashi, Enoda & Abe, 2017). Thus, while family opinions affect attitudes toward organ donation, individual attitudes also affect family opinions. Therefore, “Commenting with family” appears to affect attitudes on organ donation. As stated above, Japan uses an opt-in system for organ donation. Although family members might have a negative attitude on organ donation, engaging in discussions while the patient is alive to eliminate

differences in opinions can result in increased opportunities for organ donation. A review of studies investigating correlations between interventions and intentions on organ donation after death found that intervention, including predicting regret, correlated with improved voluntary intention to donate compared with when intervention did not include such elements (Andrew et al., 2015). Anticipated regret refers to predicted feelings of regret before decision-making when, if a certain decision is hypothesized, how much the person will regret that decision if a poor outcome results. Anticipated regret correlates with risk-avoiding behavior and also with adaptive behavior required to live a better life (Ueichi & Kusumi, 2008). It is possible that anticipating regret by means of “Commenting with family” could not only increase the likelihood of organ donation but also favorably affect grief reactions of the family after the patient's death.

## 4.3 | International comparisons based on religion and views on life and death

Several reports cited religious views as a factor affecting attitudes toward organ donation (Table 2). No differences due to academic year were noted on the formation of a concept of death that affected religious views, suggesting that factors outside of the educational curriculum were at play (Shirahama, 2002). For example, many Christians believe that death is brought about by God, that there is a type of spiritual death of the human soul when it is cut off from God, and that such death is of more importance than physical death (Hayashi, 2016). This idea clearly differs from the Confucian concept that keeping the body in an undamaged state displays respect for parents (Kim et al., 2006).

Religious events are at the core of Japanese culture, with *hatsumode* (first visit of the year to a shrine), *obon* (festival of the dead), and *ohigan* (equinoctial week when Buddhist services are held) being integral parts of daily life (Ya, 2016). Thus, views of life and death are closely related to cultural factors. Words such as “drawing one's last breath” and “becoming cold” are terms used to signify death in Japan (Minemura, Yamaoka, & Yoshino, 2010). Moreover, the idea of spirits being left over after death exists in Japan, with many believing that the body and spirit are a single entity (Konno, 2013). In light of such cultural background factors, it is unlikely that people will be able to empathize even if told that medically, brain death equates to human death.

Reports that have investigated religion and how it affects organ transplantation have revealed different results for different countries. Even within Asia, results of surveys on attitudes toward transplantation differed by religion between South Korea and Taiwan (Minemura et al., 2010). Thus, the effects of religion cannot be easily summarized. It appears that social background factors of each country affect



attitudes toward organ donation. Factors cited in our study included those related to the person's country, including characteristics by ethnicity, place of birth, and place of residence (Table 2).

## 5 | CONCLUSIONS

This study outlined attitudes toward organ donation among nursing students worldwide. Results indicated that undergraduate nursing education affects attitudes toward organ donation. Undergraduate nursing education may include elements required for cultivating understanding regarding organ donation. Positive attitudes of parents toward organ donation and transplantation demonstrated the influence of family members' attitudes, suggesting that holding discussions with family members while the patient is still alive could eliminate differences in opinions, thereby increasing opportunities for organ donation.

## ACKNOWLEDGMENTS

The authors are grateful to the people who participated in this study and the staff who were involved. This study was supported by Research Grant for Healthcare Professionals from Kitasato University Hospital and Kitasato University East Hospital.

## CONFLICTS OF INTEREST

No conflict of interest has been declared by the authors.

## AUTHORS' CONTRIBUTIONS

M. T. and M. K. contributed to the conception and design of this study; S. T. and S. A. performed the analysis and drafted the manuscript; and K. Y. critically reviewed the manuscript and supervised the whole study process. All authors read and approved the final manuscript.

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**How to cite this article:** Tsubaki M, Tougo S, Kobayashi M, Arakawa S, Yoshida K. Narrative review on attitudes toward organ donation of undergraduate nurse students. *Jpn J Nurs Sci*. 2020; 17:e12291. <https://doi.org/10.1111/jjns.12291>