



ASLI QoL 2022



AicQoL2022Penang

<https://www.amerabra.org>

10th AMER International Conference on Quality of Life
Shangri-la Rasa Sayang, Malaysia, 16-17 Mar 2022



The Effects of Health Education Programs on the Knowledge and Attitudes towards Organ Donation: A randomized controlled trial

Sharifah Shafinaz Sh.Abdullah ¹, Raja Hazwani Raja Zahri ^{1,2},
Siti Nurul Azimah Mat Jusoh ^{1,3}, Yeni Frilia Sabbok ⁴

1 Centre for Nursing Studies Faculty of Health Sciences UiTM Selangor Puncak alam Campus, Selangor Malaysia

2 Petaling Bahagia Health Clinic, Selangor Malaysia

3 Seri Kembangan Health Clinic, Selangor Malaysia

4 Kadiri University, Selomanglung street no. 1, Kediri, East Java (64115) Indonesia.

shasya@uitm.edu.my, miniewanie89@gmail.com, azieadie09@gmail.com, yenifrilia0105@gmail.com
Tel: 0132851116

Abstract

One aspect that may contribute to the limited availability of donor organs is a lack of knowledge about the legalities of organ donation (OD). Using a randomized controlled trial (RCT), this study aims to identify the effect of health education programs on the level of knowledge and attitudes towards organ donation among nursing students. There were no significant differences in the knowledge and attitude levels for both groups. However, the pamphlet group shows a positive correlation between the level of knowledge and attitude. The study revealed that pamphlets and videos have similar results in terms of educating OD.

Keywords: Organ donation, health education, knowledge, attitude.

eISSN: 2398-4287 © 2022. The Authors. Published for AMER ABRA cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BYNC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), ABRA (Association of Behavioural Researchers on Asians/Africans/Arabians) and cE-Bs (Centre for Environment-Behaviour Studies), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.
DOI: <https://doi.org/10.21834/ebpj.v7i19.3210>

1.0 Introduction

Organ donation is the gift of a body part from a recently dead person to a live donor. Organ transplantation is the preferred treatment choice for most end-stage organ illnesses since it improves the quality of life and increases long-term survival. However, a key obstacle to worldwide organ transplant programs is a lack of organ donors (WHO, 2013).

According to the WHO (2013), the gap between patients on the transplant waiting list and dead organ donors is widening. Due to the low donation rate, patients in need of transplantation sometimes have to wait long periods. Dialysis is provided to patients with end-stage renal disease until a donor organ becomes available. Patients who need the heart, lungs, or liver, on the other hand, are unable to keep the mechanical device running for long periods. As a result, there is a pressing need to increase organ donation and use. Most people are familiar with blood donation but are wary about organ donation. To ensure the effectiveness of the organ donation program, the community must be supportive of organ donation, and the family must consent to organ donation in the case of death due to brain death.

eISSN: 2398-4287 © 2022. The Authors. Published for AMER ABRA cE-Bs by e-International Publishing House, Ltd., UK. This is an open access article under the CC BYNC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>). Peer-review under responsibility of AMER (Association of Malaysian Environment-Behaviour Researchers), ABRA (Association of Behavioural Researchers on Asians/Africans/Arabians) and cE-Bs (Centre for Environment-Behaviour Studies), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.
DOI: <https://doi.org/10.21834/ebpj.v7i19.3210>

The global demand for organs significantly outnumbers supply, and Malaysia has one of the lowest organ donation rates in the world (0.53 donations per million populations in 2019). Macedonia (0.48), Bolivia (0.36), Jordan (0.20), and the Philippines (0.09) all have similar trends in organ donation rates (International Registry in Organ Donation and Transplantation, 2019).

As healthcare workers' awareness rises, so will their ability to identify and understand sources of information on organ transplantation. Participants were also told that healthcare experts did not want to provide organs as planned. Half of the people misunderstood organ transplantation and indicated unhappiness with organ donation after receiving information from prior health care professionals. As a consequence, allocating tasks for organ donation education and giving information on the important nature of organ donation will help physicians become more aware of the importance of organ donation (Yilmaz, 2011).

As a result, this research is necessary and possible since it has the potential to deliver useful health information to specific target groups as well as the general public. Furthermore, this research may aid in the formation of good attitudes regarding organ donation. As a result, the effect of health education on nurses' knowledge and attitudes towards organ donation is important in saving lives.

2.0 Literature Review

In Malaysia, the demand for organs far outstrips the supply. As a result, many medical institutions encounter difficulty recruiting organ donors. Kurz (2014) states that educational campaigns can help donor groups combat misunderstanding about organ donation. Organ donation is critical for life saving. Therefore, it is critical to ascertain the awareness of UiTM nurses on organ donation. This includes their attitudes, knowledge, and practises towards the medical issue. Increasing public awareness of organ and tissue donation can be done by including educational sessions in the curriculum of health sciences (Rykhoff et al., 2010).

Salwa (2017) led a study that found low pre-test knowledge about organ donation and transplantation and a considerable and critical improvement in post-test knowledge. Similarly, these findings imply that both pre- and post-test participants had a favourable attitude regarding organ donation. The examiner also concluded the behavioral data related to organ donation and transplantation. Following the implementation of the programme, undergraduate student nurses have developed a more positive attitude towards organ donation measures. Future studies should also include non-stop activities and increasing awareness of organ donation at various gatherings around our country.

Poreddi et al. (2016) used self-reported questionnaires to perform a cross-sectional descriptive study among chosen nursing undergraduates ($n = 271$). Members were aware of organ donations. The majority of members ($n = 251$, 94 percent) were unaware of the organ donation law. The mean score indicates that 66.7% of members had a sufficient level of information [mean standard deviation (SD), 7.34 1.61] and 72.3% have an optimistic attitude towards organ donation (mean SD, 83.9 1.01). The questionnaire discovered a statistically significant link between the participants' knowledge and attitudes towards organ donation ($r = 0.265$, $P < 0.001$). The findings highlight the importance of re-examining nursing teaching programs to prepare medical attendants to deal with concerns associated with organ donation and encouragement.

Valiee et al., (2019) utilized Solomon's four-group design; ninety-four undergraduate nursing students from Azad Sanandaj University in 2016 were randomly assigned to four groups using a census approach. The four groups' differences in post-intervention levels of awareness showcased statistically significant differences ($P = 0.0001$). Furthermore, substantial differences in post-intervention views existed amongst the four groups ($P = 0.02$). Thus, blended learning will heighten the students' awareness and commitment to their studies. However, lecturers and educators have cautioned against the use of hybrid education to teach college students about contributions. Additionally, it is wise to incorporate donation awareness into the nursing curriculum.

The study aims is to identify which teaching method is suitable in delivering organ donation information to the communities. The previous studies found that pamphlet and video teaching showed the best method in delivering information to the individual (Kim et al, 2019). A study from USM Malaysia found that the respondents had a higher preference for the video as an Environmental Education medium as opposed to pamphlets (Jamilah et al, 2015). A study from Iran reported that toothbrushing education via lecture, video, and pamphlet reduced the dental plaque index with the same effectiveness (Javad 2018). These studies showed that both method were suitable in delivering information to the communities or individuals. Previous studies reported that undergraduate nursing students developed a more positive attitude toward organ donation action after receiving an instructional teaching program (Mohamed et al,2017)

3.0 Methodology

3.1 Study location

This study was conducted in the Faculty of Health Sciences, Universiti Teknologi Mara (UiTM) Puncak Alam Campus, located in Selangor Darul Ehsan. Universiti Teknologi MARA (UiTM).

3.2 Study design

The design of this study is a single-blind randomized controlled trial (RCT) with two arms. The purpose of this study is to compare the effect of different health education programs on the level of knowledge and attitudes about organ donation among nurses. Since the techniques utilized in an RCT limit the likelihood of confounding factors influencing the outcomes, it is considered to provide the most credible data on the effectiveness of interventions (Hariton & Locascio, 2018).

The researchers explained the flow of the study after obtaining written consent from the participants. Those involved in this study have participated in both the two phases of the study. The first phase was a survey phase, the aim of this phase was to ascertain the students'

level of knowledge and attitudes towards organ donation. A questionnaire on organ donation was distributed to measure their initial knowledge of the subject. This data was considered as the baseline data.

Phase two consisted of an interventional design in which the participants were randomly divided into two arms; pamphlet-based health education or video-based health education. The aim of this phase is to ascertain the influence of health education programs (pamphlets or videos) on their knowledge and attitudes concerning organ donation. Health education is delivered through online pamphlets and video teaching. These educational materials consisted of the concept and statistics of organ donation, the several types of organ donation, legal difficulties, and motivating messages to encourage students to donate. As a follow-up to this session, participants were requested to complete an organ donation questionnaire again which served as a post-test. This procedure was carried out using a Google form link.

3.3 Randomization

Participants were randomly divided into two groups by simple random sampling. The UiTM system was used to obtain a list of all nurses. Random sample selection was carried out using the Research Randomizer generator. A list of 400 random numbers was generated using the Research Randomizer. The researcher divided the numbers into two columns: one column for odd numbers and another column for even numbers. Each number was pasted onto the envelope. Odd-numbered envelopes contained two sets of questions (pre and post-test) plus a link for a pamphlet with health information on OD. In contrast, even-numbered envelopes contained two sets of questionnaires (pre-and post-test) and a link to a health education video on OD. Participants were prompted to select either an odd or an even number. The health education method was determined by the envelope that they chose. To ensure an equal sample size, 1:1 blocking randomization was used. This was a single-blind randomized controlled trial in which participants were unaware of the intervention until they reach the randomization phase. The randomization process was carried out by the project supervisor. The participants were allocated health education method through graphical images (such as flow charts) as they had to choose the number via Google form link. The researchers were present and available for contact during the process.

Ethical approval was obtained from the UiTM Ethics Committee with the reference number of 600-TNCPI (5/1/6). However, this RCT study did not require registration with the RCT registry as this study does not have any direct health effects. As stated by ANZCTR, only RCT studies with direct health effects are required to register.

4.0 Findings

A total of 150 questionnaires were distributed, with 146 questionnaires completed (97.33 %). Group A (pamphlet-based health education) respondents were 72, whereas Group B (video-based health education) respondents were 74. The majority of participants were Muslim (n = 146, 100%), with group A having a mean age of 32.5 (3.73), and group B having a mean age of 31.5 (3.73). (3.46). Also, 12.32 percent of the population was male, while 87.67 % were female. The sociodemographic characteristics of 146 participants are shown in Table 4.1.

Table 4.1: Comparisons of the Health Education Program According to Age, Gender, and Religion

Characteristics	Group A (Pamphlet) (n=72) n (%) or mean ±SD	Group B (Video) (n=74)	Stat. (Fisher exact)	p-value
Age (year)	32.5 ± (3.73)	31.5± (3.46)	1.68	0.09
Gender			0.195	0.80
Male	8 (11.1%)	10 (13.5%)		
Female	64 (88.9%)	64 (86.5%)		
Religion			0.000	0.14
Islam	72 (49.3%)	74 (50.7%)		
Christian	0 (0%)	0 (0%)		
Buddhist	0 (0%)	0 (0%)		
Non-religious	0 (0%)	0 (0%)		

The results of the independent sample t-test on the knowledge of nurses about organ donation revealed that the mean score of participants' basic knowledge for group A (pamphlet-based health education) was 3.20 ± 1.17 (53.4 %) and for group B (video-based health education) was 3.04 ± 1.19 (50.6%). The difference in basic knowledge between the two groups was not significant (P = 0.39), indicating that groups A and B were homogeneous prior to the intervention. The mean post-test knowledge score for group A (pamphlet-based health education) was 3.59 ± 1.09 (59.8%), whereas group B (video-based health education) scored 3.36 ± 1.22 (56.0%). The baseline and post-test knowledge levels of participants were averaged. The post-test comparison of knowledge levels revealed no statistically significant difference between the two groups, A and B (P = 0.22). However, the knowledge levels of both groups increased by 6.4% for group A and 5.4 % for group B. (Table 4.2).

Table 4.2: Comparisons of pre-test and post-test knowledge level between pamphlet and video group

Knowledge on OD	n (%)	Baseline (%) M ±SD	t (df)	p-value	Post-int (%) M ±SD	t (df)	p-value	Partial Eta Square

Group A (Pamphlet)	72 (49.3%)	(53.4%) 3.20 ± 1.17	0.85	0.39	(59.8%) 3.59±1.09	1.20 (144)	0.22	0.91
Group B (Video)	74 (50.7%)	(50.6%) 3.04±1.19			(56.0%) 3.36±1.22			0.88

*Independent Samples T-Test

Score	
Knowledge	
Good	>75%
Average	50 - 75%
Poor	<50%

The results indicated that group A had a baseline attitude score of 5.63 ± 1.41 (62.6%), while group B had a baseline attitude score of 5.58 ± 1.48 (62.0%). Group A had a post-test attitude score of 6.11 ± 1.42 (67.9%), while group B received a score of 66.00 ± 1.32 (66.6%). In both the baseline and post-test scores, the participants demonstrated a positive attitude. Pre-intervention views did not significantly differ statistically between groups A and B (P = 0.81), indicating that groups A and B were homogeneous. Although there was no statistically significant difference (P = 0.62), the mean attitude score increased from the baseline to the post-test scores following the intervention. While there were no significant differences between pamphlet-based (0.94) and video-based health education (0.95), Partial ETA Squared exhibited a large effect size for the former (0.94) (Table 4.3).

Moreover, half of the research population's group A respondents consented to donate organs upon death (58.3 % at baseline, 75% post-intervention). Group B respondents agreed to donate organs upon death (67.6 % at baseline and 75.7 % post-intervention). Additionally, there was a significant increase in the number of patients signing organ donation cards or completing organ donation forms for group A (31.9 % at baseline, 41.7 % post-intervention) and group B (41.9 % at baseline, 44.7 % post-intervention).

Table 4.3: Comparisons of pre-test and post-test attitude level between pamphlet and video group

Attitudes on OD	n (%)	Baseline M ±SD	t (df)	p-value	Post-int M ±SD	t (df)	p-value	Effect size
Group A (Pamphlet)	72 (49.3%)	(62.6%) 5.63 ± 1.41	0.24	0.81	(67.9%) 6.11±1.42	0.48 (144)	0.62	0.94
Group B (Video)	74 (50.7%)	(62.0%) 5.58±1.48			(66.6%) 6.00±1.32			0.95

*Independent Samples T-Test

Score	
Attitude	
Positive Attitude	>60%
Neutral	30 – 60%
Negative Attitude	<30%

Pearson correlations were used to determine the association between knowledge and attitudes for group A (pamphlet-based health education) and group B (video-based health education). For group A, there was a positive correlation between knowledge and attitude (r = 0.26, n = 72, P = 0.02), indicating that the correlation was highly significant. However, there was no association between knowledge level and attitude in group B (r = 0.15, n = 74, P = 0.19), indicating that the correlation was not significant.

Table 4.4: Association between the level of knowledge and attitudes on organ donation among nurses

Correlation on OD	n (%)	Pearson	P-value
Group A (Pamphlet) Post-test knowledge and attitude	72 (49.3%)	0.26	0.02
Group B (Video) Post-test knowledge and attitude	74 (50.7%)	0.15	0.19

*Correlation, significant level <0.05

5.0 Discussion

Globally, organ donors are in short supply as compared to the demand from patients awaiting transplantation. Given the critical role nurses play in teaching the public about health, they must have a firm grasp of brain death, the steps of the organ procurement process, and a supportive attitude towards organ donation. Thus, knowledge and attitudes of nursing students' toward organ donation are critical since prospective nurses will play a crucial role in distributing information about organ donation, including the idea of brain death, and educating the public about the benefits of organ donation. The purpose of this study is to determine the variations in knowledge and attitudes concerning organ donation among nurses based on pamphlet-based and video-based health education programs. Additionally, the researcher sought to determine the effect of health education programs on the knowledge and attitudes towards organ donation of nurses. This study discovered that organ donation education could significantly improve the knowledge and attitudes of nurses. In general, the nurses in this study lacked information about organ donation, and the majority had only modest knowledge before and during organ donation instruction. These findings contradict Srinivasula et al. (2018) and Singh M et al. (2021) findings of Asian health science students possess adequate post-intervention knowledge. However, as proven by progress, nurses can boost understanding of organ donation through education.

The study's findings indicated that the majority of participants were between the ages of 31 and 32. According to Salwa (2017), most studies (56.25%) included participants who are aged 20-22 years. According to Jain et al., 2019, the majority of participants were between the ages of 25 and 30. Regarding religion, the all of respondents (100%) are Muslims, meanwhile, Kasim & Shohor (2021) found that the majority of respondents (88.9%, n = 56) are Muslims.

The findings of this study indicate that 59.8 per cent of respondents to pamphlet-based health education and 56.0% to video-based health education had average knowledge during the post-test, which is consistent with the findings of Chakradhar et al., 2016, who discovered that 65.4% of respondents have moderate knowledge, 22.8% have good knowledge, and only 11.74% possess poor levels of knowledge. Another similar survey conducted by Adithyan et al., 2017 found that respondents had an average level of knowledge regarding organ donation (71.8%).

The positive findings in this study regarding the attitudes of nurses indicate that positive attitudes toward organ donation developed as a result of the educational program. The study discovered that 67.9 percent of respondents to pamphlet-based health education and 66.6 % to video-based health education had a favourable attitude toward organ donation. This finding was corroborated by a study conducted by Shanthaseelan G and Eshasharma (2016), which discovered that nearly all 60% (100 people) of nursing students have a favourable attitude towards organ donation. Another survey conducted by Kasim & Shohor (2021) found that the majority of nurses (88.9%) were positive towards organ donation. A favourable attitude towards organ donation was also demonstrated by signing an organ donor card, which shows the signatory's wishes to donate their organs after death. People who want to donate their organs are more likely to have a favourable attitude towards organ donation. The study improved from the baseline (31.9%) to the post-test (41.7%). This study demonstrates the value of health education.

Moreover, the study demonstrated that the attitudes of nurses towards a positive website could change due to pursuing organ donation education. However, the results indicated that there was no statistically significant difference in the respondents' positive attitude shift from pre- to post-test. These findings are consistent with those of Potenza et al. (2015), who demonstrated that effective education on organ donation could result in considerable growths in the knowledge, attitudes, and motivation of nursing students. Additionally, it helped dispel misconceptions about nurses' roles in the organ donation procedure as they promoted their reasoning for following the teaching session.

The final outcome in this study is that there is a correlation between the levels of knowledge, with a significant positive correlation. Nonetheless, attitudes did not correlate and were statistically significant in the post-test. This deficiency emerges when time restrictions necessitate an analysis of knowledge retention following educational interventions. As a result, determining the efficiency of instructional sessions in sustaining knowledge among nurses is challenging. Although extensive information has been supplied to improve the knowledge and attitudes of nurses, it is believed that nurses may require ongoing educational sessions to ensure that knowledge is retained in their minds. As Jabade and Upendra (2021) suggest, effective educational campaigns should remain the primary source of knowledge about organ donation.

6.0 Conclusion & Recommendations

One aspect that can help the success of organ donation promotion is the awareness of organ donation and transplantation. As a result, health providers must have adequate knowledge regarding organ donation, as it is a critical link in the chain of organ procurement.

Short educational programs, such as lectures during CNE sessions, can significantly improve the knowledge and ability of nurses to discuss organ donation with prospective donor families. Additionally, education can swiftly highlight many elements of organ donation and procurement. In this study, researchers used pamphlets and videos to provide health education to the participants.

Organ donation education has been identified as a means of influencing the knowledge and attitudes of individuals about organ donation. The results showed that there were no significant differences in the knowledge and attitude level for both groups. However, this study established that the pamphlet group revealed a positive correlation between nurses' level of knowledge and attitude. The study concluded that pamphlets and videos showcase similar outcomes in obtaining information on organ donation. It has been demonstrated that education about organ donation increases the nurses' knowledge and influences their positive attitudes.

However, further research is needed to determine the long-term impact of education on knowledge and attitudes about organ donation. In addition, researchers should undertake additional studies to determine which teaching approaches are most effective at enhancing knowledge and encouraging positive attitudes among nurses.

Limitation

The study had disadvantages, such as being limited to a single university and overrepresenting Muslims in our sample. As a result, we were unable to conduct an analysis of religious disparities. The small sample size was one of the limitations when it was not able to detect the difference between the two groups

Acknowledgement

Our sincere thanks and appreciation go to professors, Associate Professors, Lecturers, and students for the input they have provided throughout our study.

Paper Contribution to Related Field of Study

This study could create awareness among health care providers about organ donation. It can also encourage healthcare providers to be more involved in organ donation programs and enable them to pass on their thoughts and ideas about organ donation to future generations. In conclusion, we must raise awareness and educate Malaysians about the necessity of organ donation. A good attitude and education may have a favorable influence on patient care as nurses play an essential role in the medical profession.

On the side of the patients in need of organ transplants, there is still hope that an increase in organ donors will eventually occur and meet the current demand. Moreover, the patients' quality of life will also improve if they have enough knowledge. Treatment expenditures, such as hospitalization, counseling, and medicine, will be reduced as the number of organ donors grows. Furthermore, this study has the potential to help lower Malaysia's mortality rate (Nazni Noordin et al., 2017).

References

- Adithyan GS, Mariappan M, Nayana KB (2017). A study on knowledge and attitude about organ donation among medical students in Kerala. *Indian J Transplant* 2017;11:133-7 <https://doi.org/10.4103/ijot.ijot>
- Chakradhar, K., Doshi, D., Srikanth Reddy, B., Kulkarni, S., Padma Reddy, M., & Sruthi Reddy, S. (2016). Knowledge, attitude and practice regarding organ donation among Indian dental students. *International Journal of Organ Transplantation Medicine*, 7(1), 28–35.
- Hariton, E., & Locascio, J. J. (2018). Randomised controlled trials - the gold standard for effectiveness research: Study Design: Randomised controlled trials. *BJOG : an international journal of obstetrics and gynaecology*.
- Limbu, B., Basnet, S., & Silwal, S. (2019). Knowledge and Attitude on Organ Donation among Nursing Students of a College in Biratnagar. *Europasian Journal of Medical Sciences*, 1(1), 28–34. <https://doi.org/10.46405/ejms.v1i1.4>
- Md Kasim, M., & Shohor, N. A. (2021). The Effectiveness of Organ Donation Education on Knowledge and Attitude Among Intensive Care Nurses. *International Journal of Academic Research in Business and Social Sciences*, 11(6), 115–126.
- Mohammed, S. A. (2017). Effect of Educational Intervention on Knowledge and Attitude of Nursing Students Regarding Organ Transplantation: A Pilot Study. *IOSR Journal of Nursing and Health Science*, 06(04), 64–70. <https://doi.org/10.9790/1959-0604026470>
- Noordin, N., Zakaria, Z., Aminuddin, A., Yaacob, M. A., & Hilmie, M. Z. (2017). Organ Donation among Malaysian : The Malay Dilemma toward Social Development. 8(10), 8–15. <https://doi.org/10.5539/ass.v8n10p8>
- Poreddi, V., Katyayani, B. V., Gandhi, S., Thimmaiah, R., & Badamath, S. (2016). Attitudes, knowledge, and willingness to donate organs among Indian nursing students. *Saudi Journal of Kidney Diseases and Transplantation : An Official Publication of the Saudi Center for Organ Transplantation, Saudi Arabia*, 27(6), 1129–1138. <https://doi.org/10.4103/1319-2442.194595>
- Riccetto, E., & Boin, I. S. de F. F. (2019). The effectiveness of current informative material in improving knowledge and attitudes and opinion of undergraduate students towards organ donation: A comparative, randomized survey study. *Clinics*, 74(4), 1–7. <https://doi.org/10.6061/clinics/2019/e743>
- Singh, M., Grewal, M. K., & Kaur, A. (2021). Methodical Learning on Organ Donation: Effect on Students Knowledge and Attitude. *Medico-Legal Update*, 21(1), 508–512. <https://doi.org/10.37506/mlu.v21i1.2361>
- Srinivasula S, Srilatha A, Doshi D, Reddy BS, Kulkarni S (2018). Influence of health education on knowledge, attitude, and practices toward organ donation among dental students. *J Edu Health Promot*;7:157.
- Valiee, S., Nouri, B., Bahmanpour, K., & Dehghani, S. (2019). Effect of Blended Education on Nursing Students' Knowledge and attitudes and Attitude Towards Organ Donation: A Solomon Four-Group Study. *Strides in Development of Medical Education*, In Press (In Press). doi:10.5812/sdme.79938
- World Health Organization. (2013, December 11).WHO |Donation and transplantation. <https://www.who.int/transplantation/donation/en/>