

Original Paper

Attitudes of Middle Eastern Societies towards Organ Donation: The Effect of Demographic Factors among Jordanian Adults

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Abstract

Background: Organ donation gives thousands of patients a renewed chance at living full and active lives. Unfortunately, the need for organs does not match their availability. This study aims to analyze the effect of demographic factors on the knowledge and awareness of the Jordanian society towards organ donation.

Methods: This cross-sectional study was conducted using a self-administered online questionnaire. We included 1041 adult Jordanians from all the governorates of the Hashemite Kingdom of Jordan.

Results: Of the 1041 participants, only 124 (11.9%) had previously signed organ donation card. Overall, 827 (79.4%) were fully accepting organ donation. Among 782 participants in the medical field, 639 (81.7%) fully accepted organ donation, compared to 188 out of 259 (72.6%) in the non-medical field ($p= 0.002$), with no significant effect of any demographic factor on the willingness to sign organ donation card. There was significant difference in the acceptance of donation from brain dead donors ($p< 0.001$), with participants from medical field and male participants having higher acceptance rates when compared with non-medical and female participants, respectively. The main barrier for organ donation was found to be the desire to be buried as a whole (58.2%), followed by traditional beliefs (47.4%), and family refusal (42.2%).

Conclusions: *In conclusion, an educational strategy can improve organ donation awareness from an early age by spreading actionable information through social media and conducting nationwide public campaigns.*

Keywords

Organ donation, transplantation, donors, brain dead, cadaver, allograft

1. Introduction

Organ transplantation gives thousands of children and adults each year a renewed chance at living full and active lives (Tsai et al., 2000). However, the need for organs and tissue unfortunately does not match their availability and people's knowledge about the importance of such procedures (Citerio et al., 2016).

Organ Transplantation is defined as the transfer of human cells, tissues or organs from a donor to recipient with an aim of restoring functions in the body (Meghana et al., 2018). Organs and/or tissues that are transplanted within the same person's body are called autografts. Transplants that are performed between two subjects of the same species are called allografts. Allografts can either be from a living or cadaveric source. The issue of organ donation is complex and multi-factorial involving ethical, legal, medical, organizational, and societal factors (Abadie & Gay, 2006; Gortmaker et al., 1998; Meghana et al., 2018).

Countries around the world have reported that people's attitudes toward organ donation are influenced by factors such as knowledge, education, and religion (Rios et al., 2015). The general population, as well as the medical society, need to be educated about organ donation and the need to accept the commitment to donate organs, and the role of organ donation in improving the quality of life of recipients (Saleem et al., 2009). Furthermore, inadequate awareness about the criteria of the declaration of brain death, even among medical field workers, can be considered as an obstacle (Bapat & Kedlaya, 2010). Several other barriers hinders organ donation in the Middle East, most of which are influenced by social factors, political unrest, ethical dilemmas, and lack of organized systems in centers that perform organ transplantations (Shaheen & Souqiyyeh, 2015).

In Jordan, the first ever organ donation was carried out in 1972, and it was a deceased-donor kidney transplant. The first cornea transplant was in 1979, heart transplant began in 1985, first bone marrow transplant in 1987, the first peripheral blood transplant was in 1995, the first lung transplant was carried out in 1997, liver transplant in 2004, and the first cord blood transplant was in 2008. The Jordanian Center for Organ Transplantation Directorate (JCOTD) was established in April 2010 and activated in October 2011. Since then, several campaigns for organ donation encouragement were held, and general provisions were made to regulate the process of organ donation in living donors and build deceased-donor organ transplant programs (Hammad & Albreizat, 2019).

This study is a step in that direction as it intends to analyze the effect of demographic factors on the knowledge and awareness of the Jordanian society towards organ donation, in addition to exploring the

effect of these factors on the acceptance of organ donation and evaluating the aspects that need further promotion to increase organ donation awareness.

2. Method

2.1 Study Design

This cross-sectional study was conducted between September 2018 and February 2019, during which 1041 participants filled an online structured self-administered questionnaire. We included urban adult Jordanians from all the governorates of the Hashemite Kingdom of Jordan, regardless of their educational level. We excluded people below 18 years old and participants with previous experience of organ donation in one or more of their first degree relatives.

2.2 Questionnaire

Questionnaires were designed using Google forms as a web-based questionnaires and distributed on Facebook, which is an online social networking and social media service website. In this questionnaire, demographic factors were included, followed by a section investigating organ donation acceptance, in which we examined the acceptance rate of organ donation from different donor groups, in addition to the acceptance of donating different organs.

Furthermore, we investigated the preferences of the participants for organ donors of they were to receive a transplanted organ, their preference for donor recipient of they were to donate their organs, and we further explored the factors which are believed to be the main barriers for organ donation in Jordanian society. The level of confidence in the current practices in organ donation counseling were measured using a visual analogue scale (VAS) from zero to five, where zero meant no confidence at all, while 5 meant full confidence in the ability of Jordanian physicians to competently counsel patients regarding organ donation.

2.3 Ethical Approval

The study was approved by the Institutional Review Board (IRB) of Jordan University Hospital. The study's methodology followed the principles of the Declaration of Helsinki, and the questionnaire did not obtain any identifying information. An informed consent was obtained after explaining the aims of this questionnaire in Arabic, which is the official language in Jordan.

2.4 Statistical Analysis

SPSS (version 21.0, Chicago, USA) was used in analysis of the data. Descriptive statistics were used to study the sample. One-way ANOVA and independent sample t-test were used to compare means and continuous variables between groups. Chi-squared test was used for categorical variables, and regression analysis was used to investigate the factors affecting confidence in the current practices in organ donation counseling. The threshold for significance was set at 0.05.

3. Result

3.1 Demographics of the Study Participants

Overall, 1041 participants were enrolled in our study. Their mean age was 23.7 ± 5.6 years, 757 (72.7%) were females, while 284 (27.3%) were males. The vast majority had Islam as their religious affiliation (954; 91.6%), followed by Christians (51; 4.9%) and atheists (36; 3.5%). Only 124 participants (11.9%) had previously signed organ donation card prior to filling the study questionnaire, of which 60 (48.4%) were medical students, 22 (17.7%) were resident physicians, 15 (12.1%) were from other medical faculties, 16 (12.9%) held non-medical university degree, 8 (6.5%) were university students in non-medical specialty, 2 (1.6%) were consultant physicians, and 1 (0.8%) held general secondary education certificate only.

Among 782 participants in the medical field, 639 (81.7%) accepted the idea of organ donation, and 650 (83.1%) were willing to sign the organ donation card. Likewise, 188 of the 259 (72.6%) in the nonmedical field accepted organ donation, which was significantly less than participants from the medical field ($p= 0.002$), and 214 (81.6%) were willing to sign the card ($p= 0.854$) (Table 1).

Strikingly, 39 out of the 259 participants with non-medical background (15.1%) had at least one family member who signed an organ donation card, compared to 76 out of 782 (9.7%) among participants in the medical field ($p= 0.018$). There was no significant difference between the two groups in the rate of signing an organ donation card ($p= 0.195$). Upon investigating whether they will accept it if one of their family members decided to donate their organs, 719 (91.9%) of participants with medical background confirmed that they would accept it, compared to 226 (87.3%) among participants from non-medical background ($p= 0.024$).

Table 1. Comparison between Participants from the Medical Field and Those Form non-medical Background in the Acceptance of Organ Donation

		Education		Total	P value
		Medical field (n=782) n (%)	Non-medical (n=259) n (%)		
Acceptance of organ donation	Yes	639 (81.7%)	188 (72.6%)	827 (79.4%)	0.002
	No	10 (1.3%)	9 (3.5%)	19 (1.8%)	
	Maybe	133 (17.0%)	62 (23.9%)	195 (18.7%)	
Acceptance of organ donation from different types of donors	cadavers	700 (89.5%)	213 (82.2%)	913 (87.7%)	0.002
	Brain dead	515 (65.9%)	132 (51.0%)	647 (62.2%)	<0.001
	Living donor	445 (56.9%)	118 (45.6%)	563 (54.1%)	0.001
Acceptance of organ donation of different organs	Blood products	714 (91.3%)	222 (85.7%)	936 (89.9%)	0.010
	Eye cornea	591 (75.6%)	173 (66.8%)	764 (73.4%)	0.006
	Liver	633 (80.9%)	180 (69.5%)	813 (78.1%)	<0.001

	kidney	688 (88.0%)	216 (83.4%)	904 (86.8%)	0.059
	heart	557 (71.2%)	182 (70.3%)	739 (71%)	0.769
	lung	532 (68.0%)	157 (60.6%)	689 (66.2%)	0.029
	Bone marrow	616 (78.8%)	170 (65.6%)	786 (75.5%)	<0.001
Willing to sign organ donation card		650 (83.1%)	214 (82.6%)	864 (83%)	0.854
Family member signed the card		76(9.7%)	39(15.1%)	115(11%)	0.018
Acceptance of family members donating their organs		719(91.1%)	226(87.3%)	945(90.7%)	0.04

The comparison between genders in the acceptance of organ donation showed that 596 of females (78%) were with organ donation, and 231 (81.3%) of males were with organ donation. There was a significant difference between males (73.9%) and females (57.7%) in the acceptance of donation from brain dead donors ($P < 0.001$).

The acceptance of donating blood products ($p = 0.014$), and eye cornea ($p = 0.048$) were significantly higher among males (93.7% and 77.8% respectively), when compared to an acceptance rate of 88.5% for blood products and 71.7% for eye cornea donation among females (Table 2).

The willingness to sign organ donation card was 83% among the studied population, with no significant difference among gender nor educational background. The belief that the participants' colleagues and society around them who signed organ donation cards will actually donate their organs varied significantly ($p = 0.031$), with 474 (62.6%) of females believing that they will actually donate their organs, compared to only 157 (55.3%) males agreeing with this statement.

Table 2. Comparison between Males and Females in the Acceptance of Organ Donation

				Gender		Total	p value
				Female (n=757)	Male (n=284)		
				n (%)	n (%)		
Acceptance of organ donation	Yes	Yes		596 (78.7%)	231 (81.3%)	827 (79.4%)	0.134
		No		11 (1.5%)	8 (2.8%)	19 (1.8%)	
		Maybe		150 (19.8%)	45 (15.8%)	195 (18.7%)	
Acceptance of organ donation from different types of donors	cadavers	Brain dead		657 (86.8%)	256 (90.1%)	913 (87.7%)	0.143
		Living donor		437 (57.7%)	210 (73.9%)	647 (62.2%)	<0.001
		Blood products		402 (53.1%)	161 (56.7%)	563 (54.1%)	0.301
Acceptance of organ donation of different organs	Blood products	Eye cornea		670 (88.5%)	266 (93.7%)	936 (89.9%)	0.014
		Liver		543 (71.7%)	221 (77.8%)	764 (73.4%)	0.048
		kidney		586 (77.4%)	227 (79.9%)	813 (78.1%)	0.381
				657 (86.8%)	247 (87%)	904 (86.8%)	0.938

	heart	541 (71.5%)	198 (69.7%)	739 (71%)	0.58
	lung	505 (66.7%)	184 (64.8%)	689 (66.2%)	0.559
	Bone marrow	568 (75%)	218 (76.8%)	786 (75.5%)	0.564
Willingness to sign organ donation card	Yes	628 (83%)	236 (83.1%)	864 (83%)	0.957

3.2 Preferences for Organ Donors and Organ Recipient

We investigated the participants' preferences for organ donors if they were to receive donated organs (Table 3), and found that more females preferred non-smoker, non-alcoholic, and non-brain-dead donors ($p = <0.001$). Remarkably, 34.2% of males did not have any preferences for organ donors, compared to 21.5% of females ($p <0.001$). Additionally, 86.6% would accept donated organs from family members, 82.3% would accept it from stranger, while only 79.3% would accept it from their friends. Males tends to accept organs donated from their friends (83.5%) more than females (77.7%) ($p= 0.041$), while there was no significant difference in the rate of acceptance of donated organs from family members ($p= 0.851$) or strangers ($p= 0.381\%$).

On the other hand, the preferences for organ recipient if participants were to donate their organs showed that significantly more females tends to have no preferences for organ recipient (61.4%) compared to males (52.8%) ($p = 0.012$). In addition, more males (21.8%) preferred young recipient compared to females (11%) ($p<0.001$) (Table 4).

Table 3. Preferences for Donors if Participants were to Receive Donated Organs

Preferences for donors if participants were to receive donated organs	Gender		Total	p value
	Female (n=757) n (%)	Male (n=284) n (%)		
Non-smoker	472 (62.4%)	143 (50.4%)	615 (59.1%)	<0.001
Non-alcoholic	508 (67.1%)	137 (48.2%)	645 (62%)	<0.001
Same gender	66 (8.7%)	22 (7.7%)	88 (8.5%)	0.616
young donors	180 (23.8%)	67 (23.6%)	247 (23.7%)	0.95
Not from brain-dead donors	183 (24.2%)	36 (12.7%)	219 (21%)	<0.001
Not from cadavers	42 (5.5%)	15 (5.3%)	57 (5.5%)	0.866
Not from living donors	120 (15.9%)	40 (14.1%)	160 (15.4%)	0.481
Organ donation is against their religious beliefs	15 (2%)	3 (1.1%)	18 (1.7%)	0.308
No preferences	163 (21.5%)	97 (34.2%)	260 (25%)	<0.001

Table 4. Preference for Organ Recipient if Participants were to Donate Their Organs

Preference for organ recipient if participants were to donate their organs	Gender		Total	p value
	Female	Male		
Non-Smoker	214 (28.3%)	88 (27.3%)	302 (29%)	0.39
Non-alcoholic	249 (32.9%)	96 (33.8%)	345 (33.1%)	0.781
Same gender	22 (2.9%)	5 (1.8%)	27 (2.6%)	0.3
young recipients	83 (11%)	62 (21.8%)	145 (13.9%)	<0.001
No preferences	465 (61.4%)	150 (52.8%)	615 (59.1%)	0.012

3.3 Organ Donation Counseling

The mean score of the confidence level in organ donation counseling in Jordan was 2.1 ± 1.4 out of 5, while the participants rated the competence of organ donation counseling in convincing patients with a score of 1.9 ± 1.3 out of 5, with no significant differences between males and females (Table 5). Moreover, among the participants in the medical field, 630 (77.9%) believes that the medical curriculum doesn't adequately give good knowledge about organ transplant to provide organ donation. The factors which are thought to be the main barriers for organ donation are discussed in Table 6, which shows that Desire to be buried as a whole is the most common barrier (58.2%), followed by traditional beliefs (47.4%), and thirdly family refusal (42.2%).

Bivariate correlations analysis showed that the competence in convincing patients was significantly associated with the confidence level ($r= 0.63$; $p<0.001$), and inversely associated with participant's income ($r= -0.06$; $p= 0.049$).

The most preferred awareness method to be used in future campaigns was social media (40.2%), followed by national campaigns and events all over the kingdom (24%), and university events and curriculum (11.2%). There was no significant difference between males and females in the preferred awareness methods ($p= 0.625$) (Table 7).

Table 5. Comparison between Males and Females in the Level of Confidence in the Current Practices in organ Donation Counseling

		Mean	p value
Confidence in organ donation counseling in Jordan	Female	2.16 ± 1.43	.375
	Male	2.06 ± 1.46	
Competence of organ donation counseling in convincing patients	Female	1.91 ± 1.27	.650
	Male	1.87 ± 1.35	

*One-Way ANOVA was used to compare between the means of the confidence level and competence in convincing patients (both scores were from 0 to 5).

Table 6. Factors that are thought to be the Main Barriers for Organ Donation in Jordanian Society

Factor	Count n (%)
Donation is against their traditional beliefs	493 (47.4%)
Donation is against their religious beliefs	379 (36.4%)
Did not hear about organ donation	250 (24%)
Did not hear about previous successful donation surgeries	341 (32.8%)
Desire to be buried as a whole	606 (58.2%)
Dislike the idea of having their organs in other person	295 (28.3%)
Family refusal	439 (42.2%)
Fear of premature termination of medical treatment of brain dead donors	296 (28.4%)
Fear of complications in living donors	320 (30.7%)
Afraid from being cut off while alive	363 (34.9%)
Fear of being used for researches	240 (23.1%)
It violates their own sanctity	355 (34.1%)

Table 7. The Most Preferred Awareness Method to be Used in Future Campaigns in the View of the Participants

Approach	Frequency
Social media	419 (40.2%)
National campaigns and events all over the kingdom	250 (24%)
University events and curriculum	117 (11.2%)
Physicians	105 (10.1%)
School events and curriculum	75 (7.2%)
Television	61 (5.9%)
Radio	10 (1%)
Brochures	3 (0.3%)
Newspapers	1 (0.1%)

4. Discussion

Organ donation gives thousands of people; children and adults each year renewed chance at living full and active lives. However, the need for organ and tissue unfortunately does not match their availability and people's knowledge about its importance.

4.1 Awareness over the Years

As a consequence of upsurge of more education and cultural development within the Jordanian population in the last decade, people became more open minded toward the idea of organ donation and

accepting the idea to be studied, that's why there had been many awareness campaigns and organizations starting to adopt this topic.

In a previous study conducted in northern Jordan in 2011, 68.5% reported that they are not willing to donate an organ during their life, while 33.9% reported they are not willing to donate their organs after their death, and the willingness for donation was not correlated to demographic factors in both cases. The commonest reason for not being willing to donate an organ during their lifetime was the fear of health deterioration (34.7%). The main source of information about organ donation at that time was the television and radio (76%), while only 40.7% heard about organ donation from the Internet. Although not statistically significant, males were more unwilling to donate in comparison to females, whether after death (68.2% males versus 65.8% females) or during their life (37.3% males versus 28.1% females) (Al Shaikh, Zaid, Khaled, & Khader, 2015), whereas our results showed a different pattern (Table 2).

Previous studies investigating blood donation awareness among Jordanian showed that even though 28.6% of participants scored their knowledge above the average, 58.6% of participants were either permanent blood donors and or willing to donate in future (Abderrahman & Saleh, 2014). In our study, we found an increasing willingness in blood donation, since 89.9% of participants are willing to donate blood products in the future.

A study was published in October 2018 that aimed to assess the public's attitude towards corneal donations in northern Jordan (Haddad, Khabour, Alzoubi, & Bakkar, 2018). It was evident that the majority of the participants (88%) were aware of the procedure, 82.8% would encourage others to donate, 67.2% were willing to be donors themselves, and 54.8% agreed to express this on their driver's license if that was an option. However, many *participants* also expressed their fear regarding the treatment of the donor's cadaver and whether organs other than the cornea would be donated. These concerns did not seem to correlate with specific religious beliefs but they differed among individuals with different educational levels (Haddad et al., 2018). Even though 73.4% of participants in our study were willing to donate cornea. Local corneal donation meet only 65% of transplant needs in the Kingdom so further action in providing the public with all the facts needed in order for them to make informed decisions about organ donations is needed.

Tong et al. (2013) conducted a meta-analysis regarding organ donation knowledge and willingness that included studies from Spain, Canada, and the US. They found that the willingness to donate to an unknown individual was 33% whereas the knowledge regarding organ donation was 76.7% (Tong et al., 2013). The willingness of organ donation in both our study and the meta-analysis of Mekkodathil et al. (2019) were higher (Mekkodathil, El-Menyar, Sathian, Singh, & Al-Thani, 2019).

We also looked into our studied population's willingness to sign an organ donation card and found that 83% were willing to sign one with no significant difference between both genders. There was also a general lack of confidence and belief in the competency of organ donation counseling in Jordan in its current state, with the mean score of confidence being 2.1 ± 1.4 out of 5 and that of competence being

1.9 ± 1.3 out of 5.

Luo et al. (2016) concluded that knowledge of organ donation among undergraduate students and residents in Hunan, China was poor and based on movies and social media outlets. They found a positive correlation between knowledge of organ donation and willingness to donate. This emphasizes the importance of community wide informative campaigns to help increase the rate of organ donation in the population (Luo et al., 2016).

This is in sync with the findings of a study conducted in Guanajuato, Mexico focusing on the attitude towards organ donation and transplantation. They found that refusal to donate stemmed from lack of information being provided to the patients from health field professionals (Lopez-Falcony et al., 2016). With regards to preferred awareness methods, the most popular method was social media (40.2%), followed by national campaigns and events (24%), and university curriculum (11.2%).

4.2 Gender Comparison

Of the 1041 *participants* enrolled in our study, 757 (72.7%) were female and 284 (27.3%) were male. In terms of comparing the general attitude towards organ donation, we see that both males and females accept the idea of organ donation, at 81.3% and 78% respectively. On the other hand, a study done to survey the attitude of medical students in Bahrain regarding kidney organ donation and transplantation found a difference between males in females in willingness to donate, 74% and 58% respectively (El-Agroudy et al., 2019). Upon considering the knowledge regarding organ donation, Alhejaili et al. (2018) found females to be more aware than males in four out of ten aspects of their questionnaire, which targeted Saudi health field college students (AlHejaili et al., 2018).

There was significant difference in the acceptance of donation from brain dead donors with 73.9% acceptance rate among males, while it was only 57.7% for females. The acceptance of donating blood products, and eye cornea were significantly higher among males (93.7% and 77.8% respectively), when compared to an acceptance rate of 88.5% for blood products and 71.7% for eye cornea donation among females.

We noticed certain differences regarding both genders preference of donations from the various types of recipients. Males had a significantly higher acceptance rate of organ donations from brain dead cadavers at 73.9% compared to only 57.7% of females. These differences went on to include certain life-style traits of the donors, with more females preferring donors who were non-smokers and non-alcoholics whereas, remarkably, 34.2% of males had no preference regarding the organ donor.

Regarding the specific organs donated, males accepted the donation of blood products and eye cornea on a higher scale than females; however, there was no significant differences regarding the other organs.

When looking at the relationship between the donor and recipient, the results show a preference for the donor to be a family member between both genders, followed by a stranger, and lastly a friend. Lopez-Falcony et al. (2016) found that the population studied seemed to be willing to donate their own organs but less so the organs of a family member. Males tended to accept donations from friends more

than females at 83.5% and 77.7% respectively. Furthermore, females showed a higher sense of no preference regarding the recipient to whom they would be donating. More males also preferred a younger recipient compared to females (Lopez-Falcony et al., 2016).

4.3 Hindering Factors and Possible Solutions

A number of factors may hinder organ donation. Personal or religious beliefs deter some people from donating. In some cases, consent cannot be obtained in time, either because the deceased did not share their wishes with the family beforehand, or because they never got around to signing up (Tumin et al., 2013).

According to a study conducted in Malaysia in 2010 through a survey approached 1420 people to examine factors that influence Malaysian persons with a tertiary level of education on their willingness to donate organs (Tumin et al., 2013). Their study revealed that 47.5% of respondents refused becoming organ donors. The main reasons for refusal was “I am not convinced that my body part will be used beneficially” (30.1%), followed by “I do not have enough access to information” (29.2%), “I want my body to remain intact after death” (16.9%), and “It is against my religion” (9.9%). So they concluded that religio-cultural factors are not a main reason for the shortage of organ donation in the Malaysian case (Tumin et al., 2013).

Another study conducted in Saudi Arabia revealed that age and religion of the recipients was not proven to be the upper hand for the participants to donate their organ (Soubhanneyaz, Kaki, & Noorelahi, 2015). In contrast, religious beliefs were found as a major factor hindering many people from expressing a motivation to donate (Saleem et al., 2009). Other reported factors were worries about receiving inadequate healthcare after donation, lack of family support, and lack of information about organ donation were the primary reasons for lack of willingness to donate (Alghanim, 2010).

According to our study, the main barrier for organ donation was the desire to be buried as a whole (58.2%). The second main obstacle for donation according to the Jordanians was that donation is against their traditional beliefs (47.4%). However, the religious beliefs were not one of the main barriers for donation and accounted for 36.4%. Also, there are factors thought to be barriers for organ donation in Jordanian society related to lack of knowledge about organ donation such as they “Did not hear about organ donation” (24%) and “Did not hear about previous successful donation surgeries” (32.8%).

A recent review of organ donation in the Middle East and North Africa has identified common features in organ transplant programs: inadequate preventative medicine, uneven health infrastructure, poor medical community and public awareness, lack of focus among transplant doctors, and shortage of actual donations (Shaheen & Souqiyyeh, 2015). This review suggested some solutions that can be implemented in Jordan. These include improving the medical community awareness via training courses, conferences, curricula of post-graduate hospital training, in addition to distribution of informational materials such as pamphlets and posters. An educational strategy is a vital tool that can improve awareness from an early age, with health officials visiting schools, encouraging public debate and disseminating actionable information through the media (Shaheen & Souqiyyeh, 2004).

Another important issue that rely on the health care professionals is how to Counsel and approach the bereaved families for organ donation. It is a complex vital process starting from grief and its stages, counseling process, the skills and characteristics of a counselor, when and how to approach the families for organ donation (Ralph et al., 2014). According to a study published by Hilhorst et al, they considered just how actively health care professionals should encourage living donation (Hilhorst, Kranenburg, & Busschbach, 2007).

4.4 Limitations

The main limitation of this study is that it did not take into consideration the educational level of the family members of the studied *participants*, which can affect their acceptance of organ donation. Additionally, further studies can be conducted to compare between different Jordanian governorates, and to measure the impact of organ donation awareness campaigns on different Jordanian communities.

5. Conclusions

In conclusion, more researches need to be conducted in order to help facilitate policy changes and put together a unified system among hospitals similar to those present in western countries to help take advantage of the willingness of the population to donate organs that we have observed in this particular study. Moreover, an educational strategy can improve organ donation awareness from an early age, especially by conducting nationwide public campaigns, schools campaigns, encouraging public debate and spreading actionable information through social media.

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