

Solid Organ Transplantation Medicine in Arab Countries: A Narrative Review Focused on Ethical Aspects

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Abstract

Introduction: Ethical issues have been at the center of transplantation medicine for the past 60 years. Arab countries are not without ethical concerns with living donations as the dominant type of organ source. There is no comprehensive review of the ethical consideration evolvement. This narrative review aims to examine the English medical literature over the past 25 years. **Materials and Methods:** This is a narrative review of the international literature from two online databases (PubMed and Scopus). The combined search term “Ethics and Transplantation” was coupled with the individual names of the countries of the Arab countries. Relevant literature was narrated in a concise thematic account. **Results:** The themes that emerged from the review process included global concern on transplantation ethics that touched on the Middle East and North Africa (MENA) region. Some reports on transplantation practice status in the MENA region address clinical practice, organization, and ethical considerations. Organ-specific reports focused on renal and liver transplantation. Several other researchers addressed the knowledge and attitudes of health-care professionals of transplantation and posttransplantation care. The ethics of transplantation medicine has focused on the donation and financially motivated provision of organs (mainly kidneys). A few authors have underscored the implications of the Istanbul declaration on the prevention of trafficking of human organs to the practice of transplant medicine. Being a Muslim-majority region, several authors addressed the ethical and medicolegal aspects of transplantation from an Islamic perspective. **Conclusions:** Ethical issues in transplantation are evolving in Arab countries. They are mostly related to religious and cultural backgrounds. A broader dialog between the medical community, Islamic scholars, and legislators must

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continue to align concepts such as brain death and donor compensation. Furthermore, a concerted effort is required to inform the public and further the transplant agenda.

Keywords: Arab countries, ethics, Islamic, kidney, liver, medico-legal, middle east, North Africa, organ donation, organ transplantation, review

INTRODUCTION

Ethical concerns accompanied clinical transplantation from its inception. Dr. Joseph Murray, (1919–2012) who performed the first successful living donor kidney transplant in 1954, was concerned about the ethics of removing a vital organ from a normal, healthy human being.^[1]

The perpetual shortage of donor organs continues to generate debate about the ethical principles applied in transplantation medicine. Several living donor issues continue to stimulate discussion and research interest.^[2-5] These include donations in the presence of hypertension, diabetes, and donations from the elderly. Other ethical concerns emerged with procuring organs from brain dead donors. Obtaining proper consent, separation of the event of death to the family, organ donation approaches, procuring organs from older donors, risk of transmission of disease, and donation after circulatory death are among such concerns.^[6]

Solid-organ transplantation in the Middle East and North Africa region began in Iran in 1968 and other countries followed. By 2012, there were 31,280 renal transplants, with 92.9% performed in five countries (Egypt, KSA, Iraq, Syria, and Jordan); 3407 liver transplants: 91.9% in Egypt and KSA; 301 heart transplants: 87.7% in KSA and Lebanon; and 62 lung transplants: 61 in the KSA.^[7] In many countries, transplantation has evolved through distinct stages of development, and at present, living-related donors continue to be the primary source of transplant organs.

The field of transplantation is packed with questions about guardianship and allocation of scarce resources (stewardship) and physician–patient relationship, in addition to principles such as altruism, autonomy, sanctity of life, and end of life questions including when precisely does life end.^[8-13]

An early account by Daar^[14] indicated that Islamic opinion is in favor of transplantation of organs from both living and deceased donors.^[14] Muslim jurists allowed bone grafts (autograft, allograft, and xenograft) for widely broken bones. Ibnosina discussed this subject in 1037 in his book *Al-Kanoon*. In 1959, the Muftis of Egypt and Tunisia allowed, under specific conditions, corneal transplants from dead persons.^[15] Thereafter, many fatwas (jurisprudence) on organ transplantation were issued from different parts of the Muslim world. In Amman, Jordan, the International Islamic Jurist Council recognized brain death as a recognized sign of death in Islam in October 1986. In 1990 and 2003, the International Islamic Fiqh Academy and the Islamic Fiqh Academy issued important fatwas on organ transplantation.^[16]

Despite these fatwas, various Muslim scholars' opinions on organ transplantation and brain death are far from unanimous. Opinions vary from a person's body being *amānah* (trust) from Allah that he/she has no right to part with any part of it, to the sacredness of the human body that considers it act of aggression against the human body, tantamount to its mutilation, if organs were to be removed after death for transplantation.^[17] On the other hand, medical practice in Arab countries is a hybrid of several systems dependent on past prenatal economic developments. This review is focused mainly on the general aspects of transplantation ethics in the Arab countries.

MATERIALS AND METHODS

This is a narrative, nonsystematic review of the literature retrieved from two online databases: Scopus (Elsevier) and PubMed (National Library of Medicine, USA). The combined search term (Morocco OR Tunisia OR Algeria OR Libya OR Egypt OR Sudan OR Syria OR Lebanon OR Saudi OR Emirates OR Yemen

OR Bahrain OR Kuwait OR Qatar OR Somalia OR Oman OR Jordan OR Palestine) AND (Ethics AND Transplantation) was used to identify the relevant records. No time or record type filters were applied. The initial electronic search retrieved 255 records in PubMed and 71 papers in Scopus with a very high degree of overlap. The retrieved articles were amalgamated and examined for relevance. Nonhuman studies and purely technical reports of no particular concern to the Arab countries or ethical considerations are excluded. Reference was also made to international studies with contributions from the Arab countries with relevance specific to the region. The selected articles were reviewed and narrated thematically. We have deliberately excluded particular issues related to bone marrow, stem cell work, assisted reproduction as their ethical challenges are somewhat different and would deserve a separate discussion. An initial draft was prepared, and all authors jointly developed the whole manuscript's intellectual content further using a single version loaded online on Google Docs drive. The resulting product was refined through several multilateral rounds of discussion including a couple of video conference sessions to review the final manuscript. All authors approved the final version of the manuscript before submission. The aim is to provide a concise thematic overview of the literature on the subject.

RESULTS

Most of the publications cover kidney or liver transplantation. Several themes emerged from the review process. The themes are not preset but reflect the available literature retrieved by the authors [Table 1].

Table 1: Emerging themes from the literature that constituted the basis of the current review*

Status of transplantation practice in the MENA region
Challenges of transplantation medicine in the Arab countries
Bioethical considerations in organ transplantation
Social and cultural perspectives
Attitudes to organ transplantation (professional and lay)
Beyond the declaration of Istanbul
Outcome of commercial organ transplantations
Different models for expanding organ donor pool
Islamic perspective on organ transplantation

*These themes were not predetermined and they emerged from the literature review. MENA: Middle East and North Africa

Organ shortage and the unresolved issue of deceased organ donation

The issue of deceased organ donation (DOD) remains problematic in the region. Patients and their families are often left to seek alternative kidney transplant routes such as buying kidneys from living unrelated donors through transplant tourism.^[17] A review by Paris and Nour addressed the ethical use, procurement, and allocation of donor organs in Egypt. They concluded that the Egyptian system does not legally recognize brain death, which encourages illegal trade in transplant organs.^[18] There is no consensus about the definition of brain death by the Egyptian medical community.^[19,20]

Contrary to a prevailing idea that opposition to DOD in Egypt is related to Islamic concerns, Hamdy^[21] drew on Egypt's ethnographic fieldwork. She argued that the main problems are how to guarantee the protection of vulnerable individuals, equitable distribution of organs, and fair access to health care. However, the public is confused about Muslim scholar's stance on brain death and deceased donation. Further work is needed to educate the public and Islamic scholars on criteria and the need for brain death and DOD.

Questions about deceased donation faced by medical professionals practicing in the Arab world were addressed in a couple of studies. Muliira and Muliira conducted a literature review examining nurses' roles in working with Muslim potential deceased organ donors.^[22] Despite manifesting several stereotypical views about Muslims and their perspectives on important issues, the authors concluded that nurses need to be educated. They need to know that organ donation is permissible by the majority of Muslim scholars despite differences in opinions.

In another study by Alwadaei *et al.*, 12 western-educated doctors were interviewed in Bahrain; a Muslim country with dominant western culture.^[23] The study highlighted the difficulty doctors faced in engaging nonmedical people in end-of-life decisions because of their reluctance to talk about death and ambiguity of current law regarding the boundaries of medical responsibilities. There were divergent views among doctors from

those who considered end-of-life decisions purely medical to those who thought of it as purely religious. Physicians are left threading a fine line between their often western training about informed consent, for example, and a prevailing sociocultural view of “doctor knows best” (or at least should), in the presence of a rising culture of litigation.

Bioethical considerations in living organ donation

Due to a lack of DOD, living donor transplantation filled the gap in managing end-organ failure. Therefore, early ethical concerns focused on living donation. Daar *et al.*^[24] proposed a classification of living donor renal transplantation under five categories: (1) living-related donation; (2) emotionally related donation; (3) altruistic donation; (4) “rewarded” gifting; and (5) rampant commercialism.^[24] Categories 1, 2, and 3 they argued were resolved, 4 remain hotly debated (even today), while category 5 is blatantly unethical.

Qatar is a multiethnic society with differences in language, socio-economic status, and cultural barriers. This situation created a significant challenge to the growth of their kidney transplant program.^[25,26] The possible economic impact on donors and the potential for exploitation of economically disadvantaged for transplant commercialism. To protect living kidney donors (LKDs), the Organ Donation Fund was created in 2001 to compensate living donors for any costs or loss of earnings they might incur during the donation process.^[24,26]

Abdeldayem *et al.*^[27] analyzed living liver donors' motives among 193 consecutive living-liver donors between 2003 and 2013 at Menoufia, Egypt. In their group of donors (mean age 26 years), two-thirds were males, offspring donating to parents were 32%, and parents to their offspring 15%. For many donors, donation seemed an attempt to reduce their anxiety and handle the fear of losing a beloved person to a life-threatening disease. For others, the wish to maintain the relationship with the recipient was a common argument often expressed by spouses. The authors could not be confident of the absence of coercion during the liver donation process but argued that serious effort is made to ensure the voluntary nature.

Wahab *et al.*^[28] reported their experience of the impact of exclusion of potential LKDs from donation. 792 out of 1004 potential living liver donors were excluded in this single-center study in Mansoura, Egypt. 639 (80.7%) potential donors were excluded by the transplant team for medical or psychosocial reasons, while 18.7% withdrew themselves during the process and in 5 the family declined donation. Interestingly, 96.2% of liver transplant recipients in this study had previous experience with multiple potential donors. In the absence of deceased donor programs, searching for a potential suitable donor by simultaneously screening and evaluating multiple potential donors carries significant cost implications and can result in over emphasis on the medical criteria for living liver donation while overlooking the voluntary and altruistic nature of living donation.^[28] The same practice may lead to potential donors be put under undue pressure, or even be coerced into donation.^[29,30]

Evaluating potential living donors is a demanding process for the potential donor, their families, and is a resource intensive endeavor. The realization rate of potential kidney donors is around 25% and identifying donors who are more likely to complete the process and end up actually donating can save significant amounts of time and effort, not to mention the anguish of all parties concerned.^[31,32]

Attitudes toward organ donation

Information about the attitudes toward organ donation in the Arab countries is the result of multiple surveys of patients, relatives, professionals, and public members.^[33-44] According to an extensive multicenter survey in Saudi Arabia, Bahrain, and Egypt by the Renal Transplant Study Group, end-stage renal disease patients tended to take the initiative in seeking living unrelated renal transplantation, despite physician discouragement, and the significant financial burden.^[33]

A survey of 702 Tunisian physicians, nurses, and technicians by Tebourski *et al.*, 59% were favorable toward organ donation.^[34] Humane reasons were the main rationale for acceptance of organ donation, while religious reservations (26.4%), personal

reasons (20.9%), and no specific reasons (22.8%) were cited for refusing organ donation. Intensive care unit staff in a tertiary in Saudi hospital were surveyed by Alsultan in 2011 when 80% of the 154 participants acknowledged that organ donation is a legal practice in Saudi Arabia, but nearly a quarter were unaware of their hospital's organ donation policy.^[35] Only 57% were willing to donate their organs. In another study from Saudi Arabia, 698 adults attending outpatient clinics at a tertiary care hospital were surveyed about their views on various forms of consent for DOD.^[36] The authors showed that most respondents were in favor of DOD, a mandated choice system was the most preferred and presumed consent system was the least preferred option.

A survey in Morocco targeted various officials related to organ transplantation as well as leaders of ethics committees and religious groups for their views about organ donation.^[37] Respondents indicated their preference for promoting living organ donation initially, followed by the gradual introduction of measures to encourage DOD. It was interesting to note that respondents expressed an ambition for a rather relatively high DOD rate (30/million). A large proportion of participants (93%) suggested a "suitable moral" motivation for organ donors. In another study from Morocco, Flayou *et al.* studied the attitudes of the medical staff toward organ donation.^[38] A third of respondents knew about the law that governs organ donation in Morocco. Participants expressed more willingness to donate organs after death than during their life (82 vs. 66%), and reasons for refusal of organ donation included a misunderstanding of risks, desire for respect of the corpse, in addition to religious and ethical motives.

Furthermore, Alashek *et al.* indicated that 30% of survey participants favored donating their organs after death, while 60% refused and 10% were undecided.^[39] Those willing to donate tended to be young, single males with a college degree or higher, while lack of adequate knowledge about the importance of DOD and uncertainty about its religious implications were the main reasons for refusing it. The effect of educational sessions on attitudes about organ donation was studied by

Hammad *et al.*^[40] They surveyed 2682 adults (age 18–70 years) before and after a teaching session on brain death and organ procurement. Respondents were questioned about circumstances of death, the conditions of conversations around organ donation, and reasons for acceptance or refusal of donation. Prior to the educational session, 72.1% reported they understood brain death versus 88% after the teaching session. The concept of brain death was accepted by 64% versus 68% before and after teaching, respectively. Presumed consent was agreed to by 35% before versus 40% after the intervention. Fifty-one percent of participants thought their religion was against brain death versus 58%. While 51% wanted to carry a donor card before teaching (vs. 59% after), and those who were agreeable to consent to organ donation in case of brain death of a relative (46% before vs. 56% after), the proportion of respondents actually carrying a donor card did not change before and after the educational session (11.3%). El Hangouche *et al.*^[41] evaluated the knowledge and perception of the public in Morocco toward organ donation as well as to identify the reasons and determinants for refusal of organ donation. This opinion survey included a representative sample of 2000 participants. They showed 55.2% of the participants were women, the median age was 21 years, and 60.8% of included participants had secondary education. Almost two-thirds showed a low to mid-level of knowledge about organ donation and transplantation in Morocco. About half of the participants refused to donate their organs. Concern about risk of medical error and the belief in trafficking of procured organs were the main reasons for refusal, seen in 66% and 62% of the interviewees, respectively. Regression models showed that the older, the less educated, and the less informed a person is, the less he accepted organ donation. The authors concluded that promotion of organ donation in Morocco should involve a regular information and awareness among the general population. In another study, Alam^[42] evaluated factors affecting the knowledge and/or attitudes of the Saudi Arabian public with respect to organ donation and transplantation in a cross-sectional study on 948 participants between 20

and 60 years of age during 2005. The study revealed that 58.5% of participants heard about the existence of SCOT, 91.1% knew the need for organ donation, and 92.7% knew that organ donation could save lives. The organ donation campaign was known to 62.3% of the participants. Of these participants, 57.9% were made aware of organ donation campaigns through TV ads, 52.8% from magazines and newspapers, and 11.7% from scientific sources. While 23.7% of the participants were unaware of any issued Islamic fatwa regarding organ donation, another 36.1% did not respond to this question revealing a lack of knowledge. Forty-two percent of the respondents agreed to donate their organs after death. Among the various reasons against organ donation, 27.5% feared that the act of organ donation contradicted their religious beliefs, while 3.5% believed that there was no benefit to organ donation. It is concluded that a need for proper information dissemination exists. A multidisciplinary approach is suggested including government support backed by strong recommendations from knowledgeable religious sources. More recently, Tarzi *et al.*^[43] evaluated the attitude and knowledge of organ donation among Syrians and the willingness of this population to donate their organs. A cross-sectional study in four hospitals in Aleppo, Syria in November 2019. Involved a total of 303 participants. The majority of participants (82%) heard about organ donation with television (55%), social media (25%), and the internet (25%) being the most common sources of information. When assessing knowledge about brain death, only 40% answered 3 or more questions (out of 5) correctly. Fifty-eight percent of respondents agreed with the idea of organ donation and 62% would like to donate their organs 1 day. The leading motivation to organ donation was the desire to help (77%), while the most common reason to refuse donation was the refusal to disfigure a dead body by removing an organ (41%). Religious reasons were cited as motivation for organ donation by 43% of participants and a reason for refusing to donate organs by 24% most respondents (88%) were unaware of the laws and legislations related to organ donation in Syria. When asked if religion and law were encouraging organ donation, 76% of

respondents would donate their organs. Although more positive attitude was found in those with better brain death knowledge (score ≥ 3), this did not translate into more willingness to donate organs in this group of participants. Palestinian university students from Nablus were surveyed by Al-Labadi *et al.*^[44] about their knowledge and willingness toward corneal donation.^[44] Of the 634 students who completed the questionnaire, 93% were unaware of the existence of an eye bank, and 407 did not show willingness toward corneal donation. Disapproval by the family was the most common reason for unwillingness to donate a cornea.

Notably, several of these surveys did not seem to include questions about receiving a transplant organ for self or a close relative. Budiani-Saberi and Mostafa^[45] identified three specific areas to be addressed in order to promote organ donation and protect living donors: Legislation to govern brain death and deceased donation, the criminalization of the buying, selling, and brokering of organs from live donors; and a sustained public education program about organ donation and brain death to target the medical, religious, academic, and legal institutions.

Outcome of commercial organ transplantation

The shortage of live donor transplant organs and the lack of DOD programs led many patients and their relatives to seek transplant organs abroad. In one study by Al Rahbi and Salmi,^[46] unavailability of a live-related donor was the main cited reason for seeking a commercial transplant (71%). Other reasons included objection and anxiety about getting a kidney donated by a family member (13% and 9%, respectively), in addition to a perceived need for a prompt transplant (3%). Few years ago, China, Philippines, Egypt, and Pakistan were well-recognized destinations for those seeking commercial transplants. In fact, Egypt was called out by the WHO as 1 of 5 organ transplant “hot spots” in the world.^[47] Transplant tourism has serious ethical concerns due to the exploitative nature of the practice, and the international swell of opinion against it has culminated in the Declaration of Istanbul, an international document banning the trade in human organs.^[48-53]

Several studies have reported on complications of commercial organ transplantation. In two studies predating the Declaration of Istanbul, Qunibi^[54,55] retrospectively reported on 540 patients who had received commercial renal transplantation in India between 1978 and 1993,^[54] and compared the findings with those of 75 recipients of living-related renal transplantation performed in two participating centers in the Middle East.^[55] Despite patient and graft survival rates being similar in recipients of commercial and local transplants, infections such as HIV and hepatitis B virus were more in the commercial transplant group. Ben Hamida *et al.*,^[56] on the other hand, highlighted the poor outcome of commercial renal transplantation in twenty cases seen in Tunisia between (1995 and 1999), 14 transplanted in Iraq, and 6 between Egypt and Pakistan. All were living unrelated commercial kidney transplants costing USD 10,000 each.^[56]

Abdeldayem *et al.*^[57] reported on 15 patients who received liver transplants in China and concluded that 11 of them had no suitable donors or no donor in Egypt. Patient survival at 6 and 12 months was 80% and 73%, respectively. Four patients died, 2 while still in China, and 82% of the survivors developed complications.

By 2018, Oman, 42 living unrelated donors (LURD) commercial pediatric kidney transplants were reported over a 22-year period.^[58] In the same report, living related donors (LRD) transplants had better patient and graft survival, and fewer surgical complications than LURD renal transplants 42.8 versus 17.8%. A similar previous study from Oman highlighted the disruptive nature of commercial transplantation on the local transplant programs by taking the pressure off health-care officials to further develop the full array of local DD and living donor programs.^[59]

In the post DOI era, AlBugami *et al.*^[32] reported on the outcome of 86 kidney transplant tourists compared to local kidney transplants. Patient and graft 1 year survival were worse in the commercial transplant group (91% vs. 98%, $P < 0.001$ and 87% vs. 98%, $P < 0.001$, respectively).^[32] In addition, transplanted tourists had a higher rate of

acute cellular rejection (20% vs. 7%, $P < 0.001$), with higher rates of serious viral, bacterial, and fungal infections compared with the locals.

Living organ donors who fall victim to commercial transplant practices continue to suffer after their donation. For a start, they may have not been candidates to donate to start with, in addition to the lack of long-term care postdonation. Organizations such as the coalition for organfailure solutions try to fill this gap by conducting outreach programs that include identifying victims of organ trafficking, assessing their consequences, and arranging support services.^[60] Paradoxically, the international ban of commercial transplantation following the DOI may have driven transplant tourism further into the black market, with such transplants now performed in appalling settings.

Beyond the declaration of Istanbul

The Transplantation Society and the International Society of Nephrology developed the Declaration of Istanbul on Organ Trafficking and Transplant Tourism in May 2008.^[48] Its principles included the condemnation of transplant commercialism, organ trafficking, and transplant tourism, and it underlined the urgency of putting the principles into action. The declaration and its principles were soon endorsed by various professional bodies and governmental organizations. The Declaration of Istanbul Custodian Group (DICG) was subsequently formed and sought to promote and uphold the DOI principles, and encouraged cooperation among professional bodies and various international and national organizations. Some of the repercussion of the declarations are presented in Table 2.^[49-53] For instance, at a fifth anniversary meeting in Qatar in April 2013, the DICG took note of progress made and set forth in a Communiqué a number of specific activities and resolved to further engage groups from many sectors in working toward the Declaration's objectives.^[49] Trading in transplant organs may be a criminal offence that governments can prosecute when committed in their territories. Organ brokers, however, tend to orchestrate their activities across borders, and in parts of the world where they know they will not be prosecuted. The DICG suggested that states be encouraged to include

Table 2: Publications on the repercussions of the “declaration of Istanbul and beyond” pertaining to practice in the Arab countries

Authors (years)	Events and themes
Danovitch <i>et al.</i> (2013)	The DICG took note of the progress since the declaration and set forth a number of specific activities and resolved to further engage groups from many sectors in working toward the declaration's objectives
Martin <i>et al.</i> (2016)	An international working group (DICG) to evaluate the possible role of extraterritorial jurisdiction in strengthening the enforcement of existing laws governing transplant-related crimes across national boundaries
Domínguez-Gil <i>et al.</i> (2018)	An international, multidisciplinary workshop (by DICG) in 2016, to address the challenges and provide recommendations for the management of patients returning home after commercial transplantation
Delmonico <i>et al.</i> (2009)	A country-by-country description of events that may affect the practice of transplantation internationally for the foreseeable future
Al Rahbi and Al Salmi (2017)	The reasons and motivations for 106 patients with ESKD to elect for commercial transplant were elicited
AlBugami <i>et al.</i> (2018)	Outcomes of 86 recipients of commercially transplanted kidneys (2008-2015) were reviewed. 1 year graft and patient survivals were significantly lower and the rate of acute rejection was significantly higher than locally treated patients
Alsharif <i>et al.</i> (2010)	A study to identify the source countries of medical travellers, to understand their reasons for seeking out-of-country care, the type of services they obtained, and their level of satisfaction with the experience

DICG: Declaration of Istanbul custodian group, ESKD: End stage kidney disease

provisions on extraterritorial jurisdiction in their laws on transplant-related crimes.^[50] A call has also been made to encourage collaboration between professionals and international authorities to develop a global registry of transnational transplant activities.

Patients who return home after receiving commercial organ transplant abroad present health-care professionals and authorities with a challenging ethical dilemma, not to mention the medical and legal problems that arise. Duty of care dictates that such patients are provided the care posttransplant patient needs. This, however, may lead inadvertently to promoting transplant tourism by way of real-life examples. Any apparent ease with which transplant tourists are accepted back into the system of care in their home countries, may also be deleterious to local transplant programs. For patients who can afford it, why have a family member go through the donation process and part with one of their kidneys are part of their liver if they can buy it abroad, and return to seamlessly resume care at their local transplant unit. With emphasis on tracing, registration, and reporting of such episodes of commercial transplantations, the DICG suggested a set of recommendations that included the resumption of posttransplant care for returning transplant tourists.^[51]

Expansion of the donor pool

The demand for transplant organs exceeds the supply. Such demand led to attempts to expand the donor pool to include donation after circulatory

death, broader living donor criteria, and exchanged paired kidney donation.

Al Sebayel *et al.* 2014 reported a 7-year experience of a mobile donor action team in Riyadh, Saudi Arabia, to promote DOD.^[61] They pursued an “aggressive approach toward organ donation through field work and provision of incentives for donors’ families and the health workers dealing with the donation logistics.” Although the authors concluded this intervention had increased deceased donation rates (3-fold increase) in Riyadh, and that it is “ethically and morally accepted,” the approach raises more questions about the quality of consent obtained in such, usually, tragic circumstances associated with brain death, and of a possible moral hazard in incentivizing health professional to increase organ donation.

Shaheen *et al.*^[62] argued that appointing an organ donation coordinator may result in early identification and better donor management, which may help the donor pool. The authors drew from the Spanish and US experiences of similar schemes that resulted in significant DOD improvements. Shaheen *et al.* concluded that the current Saudi rate of deceased donor donation of 22 possible deceased donors per million population and a 20% procurement rate can be much improved through adoption of a Saudi Proactive Detection Program.^[63]

Other initiatives included moving to a presumed consent for deceased donors and compensation of living donors.^[64] Both approaches come with

significant ethical concerns attached. The presumed consent model raises questions about the state owning its citizens body parts after their death, and utilizing them as a national resource, in addition to raising the prospect of litigation by families who do not recognize brain death as a concept. Some find it difficult to differentiate very clearly between buying organs and payments made to organ donors, often made as compensation for loss of earnings.

A shift toward some form of reward to organ donors has become more noticeable, Qatar and the US being recent examples.^[64] Yacoubian *et al.*^[65] examined the various spectrum of donor compensation models; from reimbursing costs and lost earnings, to monetary or nonmonetary forms of appreciation without direct intention to encourage donation (rewarded gifting) to a market model. Some governments created monetarily valued and socially valued incentives for prospective living-anonymous donors. Khetpal and Mossialos reported on the case of six countries with established living-anonymous kidney donation practices included two Middle Eastern countries (Iran and Saudi Arabia).^[66] The six countries used different packages of incentives to encourage living donation. The authors concluded that the degree of altruism expressed could be stratified into four models; with Iran occupied the least altruistic model and Saudi Arabia was among most altruistic.

Donation after cardiac death (DCD) is another strategy to expand the donor pool. This form of DOD remains shrouded in controversy in the Arab world, not least because the donation after brain death (DBD) is yet to be universally accepted in most jurisdictions in the Arab world. Hence, adding yet another form of deceased donation can be expected to lead to more confusion among the public, and possibly even among health-care workers. Both DCD and DBD approaches must comply with the “dead donor rule” in that the potential donor must be dead before organ retrieval. In addition, death must neither be caused nor hastened by the organ retrieval team.^[67] Significant efforts lie ahead at professional and societal levels before DCD programs can be more widely acceptable in the Arab world. Reflecting on one’s own personal, institutional, and

national experiences, achievements, and challenges can be very rewarding.^[68]

Islamic perspectives

The Arab countries are a Muslim-majority region. Predictably, the moral guidance on the organ transplantation will consider the religious principles and religious roots of cultural norms and practices. Several authors considered these issues from a bioethical and religious view point. A detailed discussion of the subject is beyond the scope of this review. However, a limited bibliography is included in Table 3 to provide a guidance to readers on the extent of interest in this aspect of the topic. To prevent duplication, these are not included in the list of cited literature. Some of the authors focused purely on the religious aspects and others included comments on practices and how these principles are perceived and practices [Table 3].

CONCLUSIONS

In Arab countries, the debate on transplantation ethics continues. Various issues are remaining unresolved around DOD and living donor advocacy. Although some progress has been made in certain

Table 3: Limited bibliography of additional articles focusing on Islamic perspectives on the moral and ethical challenges in organ transplantation

1. Ilyas M, Alam M, Ahmad H. The Islamic perspective of organ donation in Pakistan. *Saudi J Kidney Dis Transpl* 2009;20:154-6
 2. Quadri KH. Ethics of organ transplantation: An islamic perspective. *Saudi J Kidney Dis Transpl* 2004;15:429-32
 3. Shaheen FA, Souqiyeh MZ. Increasing organ donation rates from Muslim donors: Lessons from a successful model. *Transplant Proc* 2004;36:1878-80
 4. Taher LS. Moral and ethical issues in liver and kidney transplantation. *Saudi J Kidney Dis Transpl* 2005;16:375-82
 5. Tebourski F, Ben Ammar-Elgaaied A. The developing country reactions to biomedical techniques and plant biotechnology: The Tunisian experience. *J Biomed Biotechnol* 2004;2004:124-9
 6. Al-Khader AA, Shaheen FA, Al-Jondeby MS. Important social factors that affect organ transplantation in Islamic countries. *Exp Clin Transplan* 2003;1:96-101
 7. Albar MA. Islamic ethics of organ transplantation and brain death. *Saudi J Kidney Dis Transpl* 1996;7:109-14
 8. Atigetchi D. The discussion on human organ transplantation in the Islamic states. *Med Law* 1996;15:691-4
 9. Baljon J. Indo-Pakistani and Egyptian muftis on medical issues. *Muslim World (Hartford)* 1996;86:85-95
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- Note: For the sake of volume restriction. These were not included in the cited literature

areas, especially with the Istanbul Declaration and its ban on the illegal practice of organ trafficking, and the call to hold perpetrators accountable for their actions, a broader dialogue between the medical community, Islamic scholars, and legislators needs to continue in order to align concepts such as brain death and donor compensation in our region. Furthermore, public trust and awareness around organ transplantation lack in many Arabic organ transplantation areas and a concerted effort is required to inform the public and further the transplant agenda.

Authors' contribution

SAB and EAE proposed the study, performed the literature searches, and drafted the manuscript. KBA lead further developments of the manuscript. All authors reviewed the whole document for intellectual content, style, and presentation. All authors approved the manuscript's final version.

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Compliance with ethical principles

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