KI REPORTS
KIReports.org
CLINICAL RESEARCH

# Commercial Kidney Transplantation: Attitude, Knowledge, Perception, and Experience of Recipients

Fatma Al Rahbi[1] and Issa Al Salmi[1]

[1]Renal Medicine Department, The Royal Hospital, Muscat, Oman

**Introduction:** Kidney transplantation is the gold standard for patients with end-stage kidney disease. In view of shortages of available organs, long wait times for possible transplantation, and strict regulation, many patients opt for commercial transplantation. This study elicits the reasons and motivations for patients with end-stage kidney disease to elect for commercial transplant.

**Methods:** A questionnaire-based evaluation was conducted during the period from July 2015 until late December 2015. It consisted of 29 multiple choice questions and was distributed to all patients who underwent commercial kidney transplantation.

**Results:** One hundred and fifty patients were approached to participate and 106 agreed. Of the participants, 60% were male with an average age of 41.5 (SD 14.8) years and ranged from 18 to 83 years. The majority (82%) of our participants were educated ranging from primary to college level. The major reason (71%) for these participants to obtain commercial transplants was stated as the unavailability of a live related donor. Thirteen percent stated that they objected to getting a kidney donated from a family member, and 9% stated that they were worried about taking a kidney from a family member. Finally, 3% of participants stated that they needed prompt transplant and could not wait for a long time for transplant investigations and the workup associated with this program.

**Discussion:** The study showed that the most common underlying cause for seeking commercial transplantation is the unavailability of a national transplant program, particularly transplantation from deceased sources. All western ethical arguments turn out to become of vital importance in developing countries, because transplantation is the cheapest renal replacement therapy. However, it must be emphasized that commercial transplants should not be an alternative to building a national transplant initiative. The national diseased program must be a priority with full financial and administrative support. All government agencies including religious affairs must work together to support the program and to provide the citizens with a good transplantation service and ameliorate the impact of commercial transplantation.

*Kidney Int Rep* (2017) **2,** 626–633; http://dx.doi.org/10.1016/j.ekir.2017.02.010
KEYWORDS: commercial transplantation; complications; end-stage kidney disease; ethical arguments; kidney transplant; living unrelated donors; medical tourism


At the World Health Organization's (WHO) Second Global Consultation on Human Transplantation in March 2007, it was predicted that organ trafficking accounts for 5% to 10% of the kidney transplants achieved annually throughout the world.[1–3]

The occurrence and dominance of chronic kidney disease and end-stage kidney disease (ESKD) have continued to increase exponentially all over the world in both developed and developing countries.[4] The majority of patients in developed countries benefit from choices of modalities of kidney replacement therapies; however, many from developing economies undergo unfortunate deaths from uremia and cardiovascular disease.[5,6] The gold standard, nevertheless, is kidney transplantation (KT), which leads to enhancing both the quantity and quality of life of end-stage kidney failure patients.

Commercial transplantation was a growing problem worldwide almost a decade ago;[7–10] however, a number of countries still utilize this means to increase its transplant pool and statistics despite no active diseased program and very limited live related transplants.[11] Medical tourists from developed countries travel far and wide for prompt organ transplant service.[7,8,11] This

**Correspondence:** Issa Al Salmi, The Royal Hospital, PO Box 1331, code 111, Muscat, Oman. E-mail: isa@ausdoctors.net
**Received 23 September 2016; revised 9 February 2017; accepted 13 February 2017; published online 18 February 2017**

trend, however, is far more common in countries where deceased transplant programs do not exist. Patients with adequate resources in need of organs may travel from one country to another to purchase organs, mainly from a poor person, without thinking about the serious complications either for themselves after operation or for the donor after nephrectomy.[11]

Commercial transplantation is not only controversial from an ethical point of view, but it may result in serious complications in the postoperative period that can cause high rates of morbidity and mortality.[12] This is definitely unacceptable both medically and ethically.[13,14]

The primary aim of this study is to:

1. Elicit the reasons and motivations for patients with ESKD to go abroad for kidney transplantation.
2. Assess the impact of the process of living unrelated KT on the patients' well-being.

## MATERIALS AND METHODS

Initially a literature review was made through PubMed, and upon which open-ended interviews, a focus group, and a transplant questionnaire were developed. Furthermore, a pilot study was conducted to validate the questionnaire. Ten patients were approached to give their feedback on the clarity of the questionnaire, and hence the questionnaire was modified to its final version (Supplementary Table S1). The 29 questions took approximately 45 to 60 minutes to complete while patients waited for their clinicians' review.

This questionnaire-based study took place at the Royal Hospital in Muscat, Oman, located in the center of the Sultanate of Oman (see Figure 1), where these patients were given the survey immediately after transplantation. The study was conducted from July 2015 until the end of December 2015. All patients with commercial kidney transplants attending the Royal Hospital were approached to participate in the study. Patients with commercial transplants from January 2012 until December 2015 were included. Non-Omani patients were excluded.

The study consisted of an in-depth questionnaire-based interview with recipients who traveled abroad for commercial KTs. It provided demographic data and assessed the reasons for traveling abroad to obtain KTs. Patients were asked to answer 29 multiple choice questions. The researchers distributed the questionnaires to the participants to answer and advised them to ask for any clarifications. After the collection of the answers, data were entered in an Excel spreadsheet, confirmed by the 2 researchers, and analyzed by utilizing STATA software packages (College Station, TX).

Ethical approval was obtained from the research committee at Royal Hospital Number MESRC# 18/2015.

## RESULTS

A total of 150 patients were approached and 106 agreed to participate in the study. The overall mean (SD) age was 41.5 (SD 14.8) years and ranged from 18 to


**Figure 1.** Map of Oman. Copyright © 2017 Google Maps.

83 years. The mean age was 41.4 (SD 15.5) years for male participants and 41.6 (SD 13.7) years for female participants. Male participants constituted 60% of the total patients. The majority (44%) of participants who received commercial transplantations and followed up with the kidney medicine department were from the capital, 21% from the coastal region, 20% from the interior region, and only 3% from eastern regions. Similarly, patients who did not agree were young, 43.2 (SD 14.2) years, 47% were from the capital, and majority were male constituting 56% of the nonrespondents.

The majority (82%) of our participants were educated ranging from primary to college level. Regarding their work status, 41% of participants never worked at all because of their various health issues and 16% had retired from their jobs because of medical conditions. One-third of patients (35%) were employed with the government, and 8% were working in the private sector. The monthly salary received by 8% of female and 16% of male patients was less than $1500. Almost 6% of females and 20% of males were working for a salary of $1500 to $3000 per month. Twenty-one percent of female and 10% of male patients were earning more than $3,000 per month. A significant percentage of participants (21% female and 20% male) did not specify the amount of their salary.

When participants were asked about reasons for their opted commercial transplantation, the majority (71%) stated non-availability of live related donors. A smaller group (13%) stated that they objected to getting a kidney donated from a family member, and 9% stated they were worried about taking a kidney from a family member. Finally, 3% of participants stated that they needed a prompt transplant and could not wait a long time for transplant investigations and the workup associated with this program.

Regarding financial support, 30% of the study's participants stated that they were supported financially from a nongovernment organization, whereas 8% sought help from their family. The majority (60%) of participants stated that they were not supported financially to go abroad for transplantation and they used their own savings, and 2% stated that the funds came from other sources. Forty-one percent of the patients received up to $15,000 from outside resources, 41% received up to $30,000, 7.7% received more than $30,000, and 10.3% did not specify the amount.

When specifically asked about the awareness of the living related renal transplantation program in Oman, especially at Royal Hospital, only 11% of the participants stated that they were not aware of a national transplant program for related organ donors. However, the majority (80%) of participants were aware of the availability of the living related renal transplantation program, and 9% stated that they were not sure of the purpose of the existing program.

Furthermore, 49% of participants stated that they were informed of complications associated with living unrelated renal transplantation (LURRTx) by their specialist doctors, whereas 39% of them stated that they were not informed about these issues before traveling abroad, and 12% could not recall if they were informed about it or not. The majority (77%) of participants had discussed with their family their intention to travel for commercial living unrelated KT, and 23% stated that they had not discussed the matter with their family before travel.

When we asked our participants if they had paid a broker to organize their transplant before travel or not, 74% of them stated that they had not paid any money up front. However, 26% of participants stated that they had paid an intermediary before traveling abroad for commercial transplantation. Table 1 shows the total financial cost of the operation. Furthermore, the majority of patients (65%) paid the agreed amount before the operation as per discussion with their broker, and 30% of the participants paid after the operation as per the agreement. A smaller group of participants (5%) stated that they were not sure.

When asked about the place of operation, 74% of participants stated that their operation took place in a sort of vacation accommodation that was prepared as a hospital and they did not know the name of it, 14% of them stated that they were operated on at a home residence, 5% stated that they were operated on in a clinic, and 7% neither recognized nor had been told the name of the place.

Most of the participants (73%) had a good impression of the place of operation and the level of cleanliness of it, whereas 21% reported it as acceptable and the remaining 6% reported it as having a low standard of hygiene. Seventy-five percent of our participants stayed at least 7 days after operation, 15% of them stayed 4 to 6 days, and 9% stayed only 1 to 3 days in the place of operation. Only 1% of participants did not report their days of stay.

The majority of the participants (84%) stated that the same operating doctor visited them during their

**Table 1.** The direct cost paid to the broker for transplantation operation

| Operation cost | N = 106 |
|---|---|
| $15,000–$30,000 | 3 (2.8%) |
| $30,000–$45,0000 | 33 (31.1) |
| More than $45,000 | 52 (49%) |
| Not sure | 12 (11.3%) |

stay, 14% of them stated that they were not sure if they were visited by the same operating doctor or not, and 2% stated that they were visited postoperatively by someone who was not the operating doctor. Most participants (82%) stated that the doctor visited them in the same place of operation, 10% of participants stated that their doctors visited them in a different place that they were moved to after transplantation, and 8% of them stated that they were not sure about the postoperative visit.

When participants were asked if they have faced any airport problems or issues of concern during their travel back to Oman, 90% of participants stated that they had no issues, 9% of them stated that they had some difficulties and issues of concern, and 1% of participants stated that they were not sure about it.

Table 2 shows the reported feeling of participants after transplantation, and Table 3 illustrates participants' experience regarding their transplantation.

Regarding cultural and religious concepts, 12% of the participants stated that payment for obtaining commercial transplant is acceptable and 27% stated that it is not acceptable from a religious point of view. The majority (60%) of participants stated that they were not sure about religious acceptance of such an act. Only 12% of participants confirmed that LURRTx is accepted in our society, most of them (63%) stated that it is not acceptable, and 25% of them stated that whether it is acceptable or not is of no consequence to them. Furthermore, only 5% of the participants stated that LURRTx is accepted by governmental law, 45% agreed that it is not acceptable, but the majority (50%) were not sure about its acceptability.

## DISCUSSION

This is the first study to evaluate the demographic, social, and cultural influences on commercial kidney transplants. It showed that 44% of participants who have had commercial transplants and followed up with the kidney medicine department were from the capital; 60% of participants were male and relatively young with an average age of 49 years. The study revealed that the main reason for commercial transplantation was the unavailability of a live related donor in 71% of the participants. Also, it showed that patients were assisted by other patients and friends to obtain LURRTx. The study indicated that the participants were educated, financially capable, and had access to a broker who organized their commercial transplantation.

**Table 2.** The feelings of participants after transplantation

| Variables | N = 106 |
|---|---|
| Feeling | |
| Comfortable | 68 (64.1%) |
| Worried | 22 (20.7%) |
| Not sure | 10 (9.4%) |

**Table 3.** Patient's experience after transplantation

| Variables | Yes | No | Not sure |
|---|---|---|---|
| Would you repeat this experience again | 40 (38%) | 27 (25.4%) | 33 (31.1%) |
| Would you advise other patients with ESKD to do the same | 59 (56%) | 36 (34%) | 5 (6%) |
| Would you sell your kidney to other patients with ESKD | 21 (20%) | 50 (47.1%) | 29 (27.3%) |

ESKD, end-stage kidney disease.

Transplantation is the best treatment of ESKD, but unfortunately organ shortage is a reality. Because many patients with ESKD do not have living related donors and deceased donor organ donation is inadequate, living unrelated transplantation is considered. The waiting list for kidney transplants is persistently increasing despite constant efforts to increase the number of organs donated.[15] Therefore, despite the ethical issues, many patients opt for commercial transplantation. The present study found that the 2 main reasons that motivated patients to go abroad to acquire a kidney were lack of living related donors and the need for prompt transplant.

The main etiology in the 1500 patients on hemodialysis in the country was diabetic nephropathy, hypertension was determined to be the second cause, and chronic glomerulonephritis came in the third place.[16] The male-to-female ratio of the population with ESKD was almost equal with ages ranging from 1 to 90 years.[16] Our study results showed that the majority of participants had hypertension and diabetes mellitus as the main culprits of ESKD, and a good percentage of patients had an inherited cause for their ESKD. This may explain the family's refusal to opt for a live related kidney transplant in view of the high risk that the donor may ultimately end up with ESKD. Hence, these subjects favor the option of commercial transplantation especially in the absence of an active deceased program.

As per the results shown, patients seeking commercial transplantation were helped by other patients and friends, and some of them received help directly from the organ broker to get LURRTx. There seems to be an active process of advertisement for commercial transplantation where the broker educates recovered transplant patients about spreading the success of their experience. These patients are encouraged to share their successful experience to other patients with ESKD. This form of viral marketing is a free and effective way to advertise for commercial transplantation. The pitch has been rehearsed by the broker who provides his contact details for patients who had a

successful commercial KT. Because the commercial side has such a strong influence, the health system, including clinicians, must adopt a counter mechanism by showing the unethical conduct and adverse effects of commercial transplantation on individuals and society by all possible means.[17,18] Furthermore, all clinicians who received patients with commercial KT, either with good or bad outcomes, must report these concerns to the authority locally, regionally, and internationally.

In addition, brokers still approach people on dialysis directly (19%). There might be local agents working for the organ broker in the country where transplantations take place. The local agents seem to organize most of the logistics in the recipient's country, whereas the main broker in the country of transplantation organizes all the rest of the logistics with the donor, the medical staff, and the place of operation. The local agents may receive incentives from the main broker and/or the recipients of KT. Nevertheless, the agents receive a significant payment, whereas the amount of "rewarded gift" to the donors could never be sufficiently helpful to solve any financial problem that caused them to decide to donate. Our study has shown that 3% of participants paid only $15,000 to $30,000, 33% paid between $30,000 and 45,000, and 52% of the participants stated that they had paid more than $45,000 for KT; 65% of them had paid before the operation and after the agreement was made with the broker on the price for the obtained kidney. In 2015, Oman Gross Domestic (GDP) per capita was 15,305.67 US dollars (USD). The GDP per capita in Oman is equivalent to 121% of the world's average. GDP per capita in Oman averaged 12,742.95 USD from 1960 until 2015, reaching an all-time high of 20,257.96 USD in 2009 and a record low of 713.67 USD in 1961.

Over the last few years, unrelated commercial activity has exceeded, by many folds, the ethical living related transplants in certain parts of the world.[17,18] In recent years, Pakistan has become one of the largest host centers for commercial kidney transplant tourism,[13,17–23] as has been shown in this study where 55% obtained KTs in Pakistan. There are a number of reasons for this. First, Pakistan offers the cheapest options compared with China, which is much more expensive. Secondly, there seems to be easy access to enter and exit Pakistani airports without any problem. Thirdly, there is no shortage of donors who are in need of temporary financial help in this country. Finally, geographically, Oman and Pakistan are in close proximity; hence travel arrangements are easy and achievable.

According to the results, most of the patients with ESKD who went for commercial transplantation are educated patients with high monthly incomes and had not received any financial support from the government agencies when going for LURRTx. According to this study, the majority of our participants are educated with at least a primary education. This implies that the patients had a reasonable level of education to understand and comprehend the risk of commercial KT and the serious complications once they received enough counseling regarding the prohibition of this phenomenon. The results showed that 49% of participants stated that they were informed regarding the complications of living related renal transplantation by their specialist doctors, yet they still went ahead with commercial transplantation. This is possibly due to a slow transplant program in the country, long wait times for medical evaluation, and the delay of surgical procedures.

Medical and surgical complications of commercial transplantation are very well known.[13,20–24] This probably occurs commonly due to inadequate pretransplant assessment and short hospitalization period after operation. Many patients were sent to their home country without treating life-threatening complications to cut costs and maximize profits.[11,24] This situation is even worse in the least developed countries. This practice has been condemned by all transplant societies.[6,25] Patients with ESKD who are considering commercial transplantation abroad should be made aware of the potential pitfalls of this risky venture.[6,25] Hence efforts must be directed towards strengthening the national program with full logistic, financial, and strong legislation that protect human lives locally, regionally, and globally and must collaborate with international efforts to combat organ trafficking and commercialism, and to encourage the notion of humanity's best interest.

In describing the feelings of patients who had received commercial transplantations, our study showed that it was a positive experience for the participants, who stated that they would repeat their experience if required and they will also advise other end-stage kidney failure patients to get LURRTx. This is a strong stance for people receiving LURRTx to take. It emphasizes the fact that they had been well educated and positively influenced by the organ broker on their successful treatment and life-changing transplant.

Furthermore, the total cost of the transplant was far less than that in the West, but despite that, some patients felt financially exploited as 65% of them paid before the operation after the agreement was made with the broker. After the operation, most of the patients stayed for 7 days in the same place of operation and were visited by the same doctors who operated on them. Their experience has been largely positive except for negative feelings towards the broker and the

standard of hospital hygiene in some cases. The total cost of the transplant was reasonable and affordable by most patients who participated in the study, but despite that, a small percentage of patients felt financially exploited.

The main centers for these practices were in Pakistan. Although the practices are illegal, the regulatory system is not strong and there is no shortage of donors willing to sell their kidneys. The reason could be the involvement of people with good connections and authority in the country. However, commercial transplantation used to be present in many locations such as Iraq, Iran, Eastern Europe, South America, South Africa, and the Philippines. Strict legislation and implementations of the laws had almost entirely abolished the commercial transplantation in its known form though the practice may be present in different ways.[1,26,27] In China, commercial organ transplantation from executed prisoners is an ongoing practice despite a strong international opposition by various authorities including the World Health Organization. Six large commercial transplantation programs have also been established in China, attracting recipients from around the world. The source of these commercially acquired kidneys is not always perceptible.[8,28]

The places of surgical operation were acceptable for most of the transplanted patients. The majority of them reported that they were operated in a vacation accommodation that was prepared as a mini-hospital. Also, there seems to be an agreement in advance between the recipients and brokers about where the operation will be performed despite a poor set-up. However, if these transplantations are practiced in predictable conditions, they may have good graft and patient survival rates, but in unconventional places of transplantation, the results can range from not constructive to poor.[10,25,29] Lack of proper surgical instruments and poor hygiene and/or standard of care could have very serious medical and surgical consequences for both donors and recipients, which mostly take place in the least developed countries. This practice has been condemned by all transplant societies.[2,30,31]

From a cultural perspective, most of the participants agreed that the commercial practice is not acceptable and therefore they need more education and counseling regarding the moral and ethical considerations of organ transplantation. Moreover, medical and surgical considerations, in addition to ethical aspects of living unrelated transplantation, are even more complicated due to the concern of commercialization and poor settings of transplant procedures that compromise both the donor and recipients' lives to various malpractices and surgical complications. Making payment to the donors has been considered strictly as unethical by many authors, while some others suggest reopening previous debates of sales of kidneys.[10,32] The latter claim that if the exploitation of donors is avoided, the reward (or payment) to the donor can be morally justified. A good example may be considered by some authorities wherein Iran carries such a program of payment for donation. Apart from these controversies, it is uniformly accepted that commercial transplantation is certainly unethical when brokers are involved or the aim is just profit for transplant physicians, because the main reason in favor of organ sales is to improve the quality of life of the patients and the donors, not the brokers or the physicians. All these theoretical ethical arguments in Western countries turn out to become of vital importance in developing countries, because transplantation is the cheapest renal replacement therapy.[7,32] The transplant activity can be increased substantially in the country if the health authorities give higher priority to the deceased-donor organ donation program. The World Health Organization call for all countries to provide the utmost possible health care of good quality for their citizens within their boundaries and to protect human lives and dignity, wherever it is, at local, regional, or international level. These countries must increase their GDP percentage of contribution to their health programs. On the other hand, the country where donors are used must strengthen its legal system and track the brokers and those who run this network of illegal transplantation across the country.

Although kidney transplantation improves the lifespan for patients with ESKD, minimizes morbidity, improves quality of life, permits social and medical rehabilitation, and reduces the costs associated with the medical care,[17] commercial transplantation is an unacceptable practice that violates the basic human rights and disregards all international ethical principles. Beneficence, doing good, avoiding harm, autonomy, and fairness is a central belief of medical ethics. It is the commitment to attempt, at all times, to do good for the patient, whether a donor or recipient. The broker is the cornerstone in the commercial transplant and can be easily identified in each country involved. This could be used to ameliorate this practice and set up a standard of care within each country involved in commercial transplantation.

However, it is impossible to suggest a uniform solution for all countries because of wide differences in economic status as well as social and cultural values.[24] Thus, the country should build its own ethical standards for live unrelated transplantation but with adherence to the international standard and World Health Organization recommendations and respect human lives and values.[1,2] Most importantly, we emphasize that commercial transplants should not be

an alternative to building a national transplant initiative. Although there is a very modest effort for deceased programs in the country, the lack of legislation, infrastructure, and awareness has prevented growth of deceased donor programs in Oman. Each government must have a national program at the highest level with full logistic, financial, and administrative support. All government agencies, including religious agencies, must work together to support the program to provide the citizens with the service and ameliorate the impact of commercial transplantation.

However, because the health system provides free general medical coverage for all residents, this makes it less likely for people not to look for medical treatment. Nevertheless, almost 50% of individuals living in Oman are noncitizens from Asia and, in particular, from the Indian subcontinent, with no free universal medical treatment. Consequently, these individuals tend to return home for permanent RRTs once they have serious disease, and data for such cases are not reported to the registry. There is a need to point out the social and economic disturbances imposed on the expatriates diagnosed with CKD, which results from the repatriation policy. This policy needs to be re-evaluated, and concerned authorities must adopt new policies aimed at improving the health of the expatriates. Full health insurance coverage for all foreign workers is a necessary part of a work agreement and expats should be treated like Omanis; therefore, deporting them is against human rights.

In many developing countries such as those in the Indian subcontinent and Sub-Saharan Africa, a large percentage of patients who develop ESKD are not offered RRT or do not have the economic capability to sustain the treatment offered to them. For example, in India, only approximately 10% of persons who developed ESKD could afford payment for long-term RRT. Another problem is that poor documentation and lack of continuity within a fragmented network of both public and private providers may underestimate the incidence and prevalence of health problems. However, all patients are covered and paid for by the public health system, even if they undergo dialysis at a private clinic, which is only a single center in all of Oman.[16] Nonetheless, a good percentage of individuals do go abroad for medical tourism, and some return home to continue their therapy.[16]

There are a few limitations of the present paper. The positive survey responses indicate positive medical outcomes in the respondents. The positive responses may represent the tendency of participants to justify their endeavor with the commercial transplant. This may have produced a bias where respondents tend to highlight the positive outcomes and conceal negative results. Furthermore, the lack of medical information differences between respondents and nonrespondents remains a significant limitation of this paper. Possibly, the nonrespondents may have had negative impacts of the commercial transplant and were not willing to disclose such information.

The study showed that patients often travel outside their country border to seek medical treatment for ESKD through organ transplantation due to the lack of a strong health system that provides all necessary tools of care. Oman, similar countries in the regions, and various other countries around the world must empower their citizens, provide the care required to improve their lives, and preserve dignity and human values. Efforts must therefore be directed towards strengthening the national program with full logistic, financial, and strong legislation to protect human lives locally, regionally, and globally and must collaborate with international efforts to combat organ trafficking and commercialism and to encourage the notion of humanity's best interest.

## DISCLOSURE

All the authors declared no competing interests.

## ACKNOWLEDGMENTS

The authors would like to thank all participants in the study for their time and effort to respond to the questionnaire.

## SUPPLEMENTARY MATERIAL

**Table S1.**

Supplementary material is linked to the online version of the paper at www.kireports.org.

## REFERENCES

1. Danovitch GM, Chapman J, Capron AM, et al. Organ trafficking and transplant tourism: the role of global professional ethical standards—the 2008 Declaration of Istanbul. *Transplantation*. 2013;95:1306–1312.
2. Budiani-Saberi DA, Delmonico FL. Organ trafficking and transplant tourism: a commentary on the global realities. *Am J Transplant*. 2008;8:925–929.
3. Budiani-Saberi DA, Raja KR, Findley KC, et al. Human trafficking for organ removal in India: a victim-centered, evidence-based report. *Transplantation*. 2014;97:380–384.
4. van Walraven C, Manuel DG, Knoll G. Survival trends in ESRD patients compared with the general population in the United States. *Am J Kidney Dis*. 2014;63:491–499.
5. Commercially motivated renal transplantation: results in 540 patients transplanted in India. The Living Non-Related Renal Transplant Study Group. *Clin Transplant*. 1997;11:536–544.
6. Erikoglu M, Tavli S, Tonbul Z. Ethical and economical appreciation of living nonrelated donors renal transplantation from outside Turkey. *Transplant Proc*. 2004;36:1253–1254.

7. Hoyer PF. Commercial living non-related organ transplantation: a viewpoint from a developed country. *Pediatr Nephrol*. 2006;21:1364–1368.
8. Vathsala A. Commercial renal transplantation—body parts for sale. *Ann Acad Med Singapore*. 2006;35:227–228.
9. Akoh JA. Key issues in transplant tourism. *World J Transplant*. 2012;2:9–18.
10. Babik JM, Chin-Hong P. Transplant tourism: understanding the risks. *Curr Infect Dis Rep*. 2015;17:473.
11. Sever MS. Living unrelated-commercial-kidney transplantation: when there is no chance to survive. *Pediatr Nephrol*. 2006;21:1352–1356.
12. Bahous SA, Stephan A, Blacher J, Safar M. Cardiovascular and renal outcome in recipients of kidney grafts from living donors: role of aortic stiffness. *Nephrol Dial Transplant*. 2012;27:2095–2100.
13. Akhtar F. Chronic kidney disease, transplantation practices and transplantation law in Pakistan: opportunity for a global meditation. *Artif Organs*. 2009;33:570–576.
14. Krishnan N, Cockwell P, Devulapally P, et al. Organ trafficking for live donor kidney transplantation in Indoasians resident in the west midlands: high activity and poor outcomes. *Transplantation*. 2010;89:1456–1461.
15. Abouna GM. Organ shortage crisis: problems and possible solutions. *Transplant Proc*. 2008;40:34–38.
16. Al Ismaili F, Al Salmi I, Al Maimani Y, et al. Epidemiological transition of end-stage kidney disease in Oman. *Kidney Int Rep*. 2017;2:27–35.
17. Reese PP, Boudville N, Garg AX. Living kidney donation: outcomes, ethics, and uncertainty. *Lancet*. 2015;385:2003–2013.
18. Reese PP, Caplan AL, Kesselheim AS, Bloom RD. Creating a medical, ethical, and legal framework for complex living kidney donors. *Clin J Am Soc Nephrol*. 2006;1:1148–1153.
19. Fahrenwald NL, Stabnow W. Sociocultural perspective on organ and tissue donation among reservation-dwelling American Indian adults. *Ethn Health*. 2005;10:341–354.
20. Hussein MM, Mooij JM, Roujouleh H, el-Sayed H. Commercial living-nonrelated renal transplantation: observations on early complications. *Transplant Proc*. 1996;28:1941–1944.
21. Qunibi W, Abulrub D, Shaheen F, et al. Attitudes of commercial renal transplant recipients toward renal transplantation in India. *Clin Transplant*. 1995;9:317–321.
22. Rizvi SA, Naqvi SA, Hussain Z, et al. Renal transplantation in developing countries. *Kidney Int Suppl*. 2003;(83):S96–S100.
23. Rizvi SA, Naqvi SA, Zafar MN, et al. Commercial transplants in local Pakistanis from vended kidneys: a socio-economic and outcome study. *Transpl Int*. 2009;22:615–621.
24. Kute VB, Gumber MR, Patel HV, et al. Outcome of kidney paired donation transplantation to increase donor pool and to prevent commercial transplantation: a single-center experience from a developing country. *Int Urol Nephrol*. 2013;45:1171–1178.
25. Yakupoglu YK, Ozden E, Dilek M, et al. Transplantation tourism: high risk for the recipients. *Clin Transplant*. 2010;24:835–838.
26. Shaheen FA, Souqiyyeh MZ. Current obstacles to organ transplant in Middle Eastern countries. *Exp Clin Transplant*. 2015;13(Suppl 1):S1–S3.
27. Shaheen FA, Souqiyyeh MZ, Ramprassad K, Attar MB. Current issues and problems of transplantation in the Middle East: the Arabian Gulf. *Transplant Proc*. 2001;33:2621–2622.
28. Vathsala A. Outcomes for kidney transplants at the National University Health System: comparison with overseas transplants. *Clin Transplant*. 2010:149–160.
29. Mansy H, Khalil A, Aly TF, et al. Outcome of commercial renal transplantation: two years follow-up. *Nephron*. 1996;74:613–616.
30. Bailey P, Tomson C, Risdale S, Ben-Shlomo Y. From potential donor to actual donation: does socioeconomic position affect living kidney donation? A systematic review of the evidence. *Transplantation*. 2014;98:918–926.
31. Keller F, Winkler U, Mayer J, Stracke S. Should commercial organ donation be legalized in Germany? An ethical discourse. *Transplant Proc*. 2007;39:475–477.
32. O'Hara JF Jr., Bramstedt K, Flechner S, Goldfarb D. Ethical issues surrounding high-risk kidney recipients: implications for the living donor. *Prog Transplant*. 2007;17:180–182.