



ORIGINAL ARTICLE

A Gift of Life during Life: Example of Iraqi Model for Renal Transplantation

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Abstract

Background: Kidney transplantation (KT) is an advanced, life-saving technique for treating patients with kidney failure. This procedure has been performed in Iraq since 1973 and relies on a living kidney donor. This cross-sectional study aimed to examine the demographic characteristics of living kidney donors (KD) in Iraq and to analyse their knowledge and motivations.

Methods: A descriptive cross-sectional study was conducted on living kidney donors recruited from the renal transplant centres in two central teaching hospitals in Baghdad, Iraq. The donors provided their informed consent to participate in this study and volunteered to complete the questionnaire paper forms designed during the period from April 1, 2021, to January 1, 2022.

Results: In total, 176 kidney donors were included in this study. The mean age of the donors was 32.3 ± 5.4 years, with 66.5% males and 33.5% females. Of the donors, 56.9% were married, and 50.7% had 2-3 children. 54.5% had family members suffering from chronic illnesses, while 74.9% of the recipients were immediate relatives. Donations were mainly for humanitarian and social reasons, accounting for 53.3% and 37.1%, respectively. Only a small proportion (1.8%) received financial rewards.

Conclusion: The study found that most participants were young, unemployed, married, and well-educated men, guided by religious and social principles, and expressly opposed to any form of remuneration. Careful assessment of the living kidney donors is important to detect commercial transplantation and avoid post-transplant social and legal consequences.

Keywords

Renal transplantation, Features, Living donors, Example, Iraq

Abbreviation

KT: Kidney Transplant; KD: Living Kidney Donors; MoH: Ministry of Health

Introduction

Chronic kidney disease affects more than 10% of the global population and is one of the most common causes of death worldwide. They are usually associated with factors such as advanced age, female gender, diabetes mellitus, and high blood pressure. Kidney transplantation KT is an important medical procedure that saves lives and extends the lifespan of patients with end-stage renal disease; estimated glomerular filtration rate (GFR) ≤ 15 ml/minute [1]. This is particularly important because patients with this condition have a 70 percent risk of dying within five years if they rely solely on dialysis. Typically, a patient with kidney failure is transplanted with a single kidney from a deceased or living donor. The kidney recipients may or may not have a biological connection with the donor; hence, they should undergo a comprehensive assessment to ensure compliance with legal and ethical requirements as well as a full understanding of the cultural significance of such treatments [1,2]. Although KT has been practiced for many years in Arab countries, including Iraq, numerous

obstacles hinder the expansion and development of transplant health services, such as inconsistent health infrastructure, inadequate planning for organ procurement, and limited government support. Patients who underwent KT exhibited a 91% survival rate over 5 years, encompassing their overall well-being and the functionality of the transplanted organ [1,2]. Living kidney donation is the predominant form of kidney donation in Arab countries, including Iraq [3]. Islamic scholars, authorities, and institutions have explicitly expressed religious support for both living and deceased organ donation models, although there are theological disagreements over the requirements of brain death in the context of deceased organ donation [4]. Organ donation from a deceased person is often viewed by many as a technique that disfigures a respected body that should instead be promptly cleaned, packaged, and buried, according to Islamic teachings [4,5].

Historical Background

In 1973, Iraq became the first Arab country to perform a kidney transplant at Al Rasheed Military Hospital in Baghdad, ahead of other Arab countries such as Sudan, which performed its first transplant in 1974, and Egypt, which did so in 1976 [3]. The first KT in a university hospital occurred in 1985 at the Medical City Teaching Hospital in Baghdad [5]. To support KT services, the Iraq Ministry of Health (MoH) appointed an Irish team to deliver KT at Ibn Al Bitar Hospital. The team was responsible for performing transplants every week until economic sanctions and the impending Gulf War forced them to leave the country in 1991 [6]. The Iraqi government has implemented regulations to curb the potential for paid donations and organ trafficking. This included interviewing donors with a team of professionals and implementing strict monitoring measures in private hospitals. The MoH has formed seven central committees to oversee the donation process. The Central Committee included a nephrologist, a psychiatrist, and representatives from the MoH. The main task of this committee is to refute any allegations of commercial transactions and attribute the records to either the government or a private hospital. 35 hemodialysis centers provide care for more than 6,000 individuals undergoing dialysis [6,7]. The Renal Transplant Center attached to Medical City Teaching Hospital in Baghdad is the oldest and most equipped government facility of its kind. After the year 2009, additional centers were established in other governorates, and by the end of 2019, a total of 5,950 KT surgeries were performed in Iraq, with a growing annual rate of 16.25 per million individuals [7]. The original kidney transplant legislation, Law No. 60, was enacted in 1981. It was then reviewed and approved by designation 4405 on May 16, 2016. The legislation specifically prohibits the purchase and sale of organs and imposes penalties on hospitals that authorize kidney donations from Iraqi citizens to recipients who do not

have Iraqi citizenship [8]. This study included a cohort of kidney donors selected from the Renal Transplant Center at the Medical City Teaching Hospital. These donors were selected after medical and psychological evaluations by a Renal Transplant Committee panel.

Methods

This study was conducted between April 1, 2021, and January 1, 2022, at the Renal Transplant Center of the Medical City Teaching Hospital. Potential KD who met their medical and administrative requirements were approached individually and invited to participate in this study, and any KD who refused to participate was not included in the study. The consenting KD were interviewed in the adjacent waiting room privately and handed the Arabic Questionnaire paper forms to fill out at their convenience, with assistance of the investigator if the participant was illiterate. The selected participants readily agreed to participate in the study after receiving a detailed explanation of the study's aim and were assured about confidentiality. The investigator (second author) visited the centers twice weekly, from 9 a.m. to 1 p.m., approaching the participants accordingly. Each participant provided written consent to participate in the study and was informed that they could withdraw from the study at any time. The second author conducted personal interviews with the participants, provided them with survey formats, and addressed any associated uncertainties. The face-to-face interview took place in a nearby, secluded room and was conducted by the second author. The Arabic version of the questionnaire was developed in collaboration with a community health professor. The study protocol was approved by the Ethics and Research Committee of the Iraqi Council for Medical Specializations (order number: I1134/D,105), following the 1975 Helsinki Declaration. Further, official confirmation was obtained from the Research Ethics Committee of the MoH. Formal approval was also obtained from the hospital's administrations following the 1975 Helsinki Declaration. The questionnaire consisted of a series of organized questions in Arabic, covering topics such as sociodemographic information, donation motives, identification of beneficiaries, cases of coercion or intimidation, and the presence, type, and amount of payment, which is known as "commercial transplant." The collected data were submitted for statistical analysis by an academic statistician using the statistical tool SPSS-28 (Statistical Packages for Social Sciences, Version 28). The data were presented using basic statistical metrics, such as frequency, percentage, mean, standard deviation, and range (minimum-maximum values). The results were calculated, analyzed, and discussed accordingly.

Results

The study included 176 participants, 104 from the Nephrology and Renal Transplant Unit in Medical City Hospital and 72 from the Renal Transplant Unit in Al-

Table 1: Sociodemographic characteristics of the studied kidney donors.

		No	%
Age (years)	18-20	22	13.2%
	20-39	96	57.5%
	40-60	49	29.3%
Sex	Male	111	66.5%
	Female	56	33.5%
Marital status	Single	59	35.3%
	Married	95	56.9%
	Divorced	10	6.0%
	Widow	3	1.8%
Number of children	0	12	14.8%
	1	9	11.1%
	2-3	41	50.7%
	≥ 3	19	23.4%
Education	Illiterate	33	19.8%
	Primary school	71	42.5%
	Secondary school	42	25.1%
	University degree	21	12.6%
Residence	Baghdad center	78	46.7%
	Baghdad periphery	19	11.4%
	Other governorates	70	41.9%
Employed	Yes	122	73.1%
	No	45	26.9%
Monthly income (IQD)	< 500,000	5	3.0%
	500,000-1000000	143	85.6%
	> 2000000	19	11.4%
House owner	Yes	76	45.5%
	No	91	54.5%
Car owner	Yes	48	28.7%
	No	119	71.3%

Karama Hospital. All the participants were Muslims and Iraqis. **Table 1** shows the distribution of the participants by age group. Specifically, 57.5% of the participants were between 20 and 39-years-old, 29.3% were between 40 and 60-years-old, and 13.2% were between 18 and 20-years-old. 66.5 Of the participants, 66.5% were males and 33.5% were females; of these, 35.5% were single and 56.9% were married. Of those who were married, 50.7% had two or three children. Among the participants, 19.8% had no formal education. The proportion of secondary school graduates was 25.1%, while that of university graduates was 12.6%. Approximately 58.1% of the people were residents of Baghdad and its surroundings. 73.1% of the participants had a stable job in the government or private sector, while 26.9% were unemployed. A total of 85.6% of participants described their financial status as “fair,” estimated at 500,000-2,000,000 Iraqi Dinars (IQD) per

month, and 11.4% had a “good” level of more than 2,000,000 IQD per month [9]. In addition, 45.5% and 28.7% of the participants owned their houses and their cars, respectively [9].

Table 2 shows that 3.6% of participants were motivated by financial gain, 53.3% were motivated by humanitarianism (altruism), and 37.1% were motivated by social responsibility. Of the 91.6 participants, 91.6% were able to identify the recipients, while 4.8% remained unknown. Among the approved recipients, 74.9% were first-degree relatives, and 25.1% were second-degree relatives or friends. 44.0% were siblings, whereas 17.6%, 14.4%, and 9.6% were parents, nephews, nieces, and spouses, respectively. 89.8% of the respondents said they had not made any financial gain, 8.4% declined to answer, and 1.8% expected a reward.

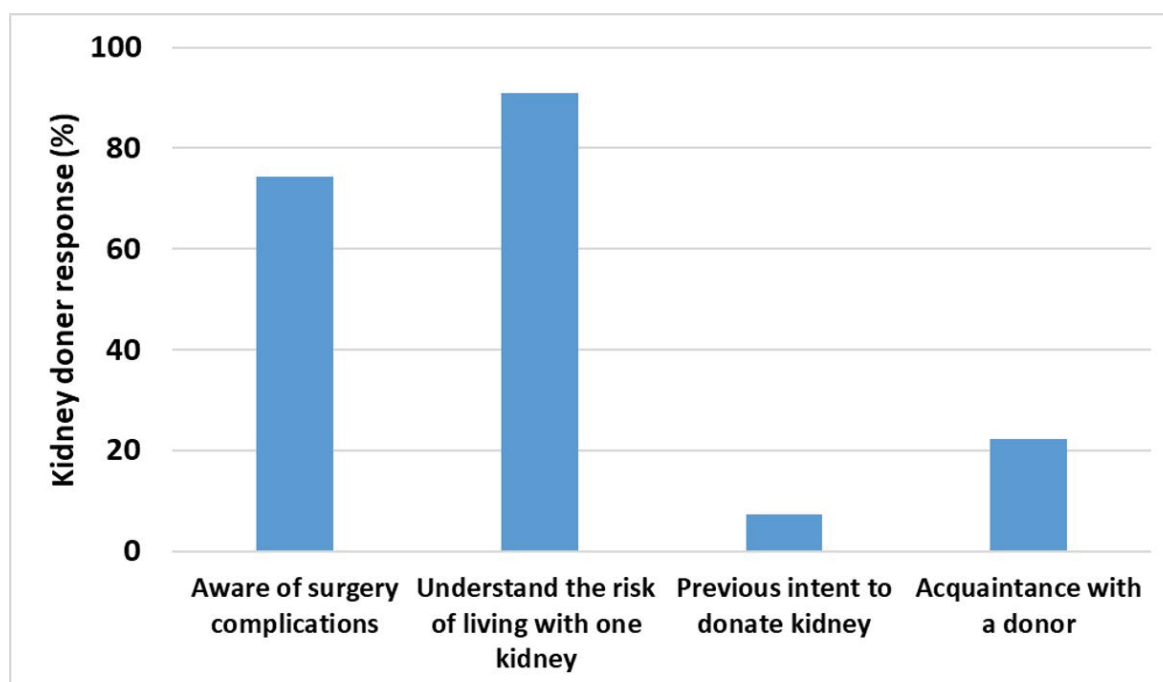
Figure 1 shows that 74.3% of the participants indicated that they were aware of postoperative adverse consequences; 91% reported being aware of living with a solitary kidney; 7.2% had previously attempted to donate their kidney, and 22.6% had contact with a healthy donor living with a single kidney.

Discussion

This study examined the personal attributes of 176 potential living donors with a mean age \pm S.D. 32.3 ± 5.4 (ranging from 18 to 43) years. These findings align with prior research and suggest that the decision to donate one’s kidneys may be influenced by a certain level of maturity. Additionally, the study indicated that the age range for kidney donation is typically between 18 and 60-years-old. While there is no specific law in Iraq that forbids those aged ≥ 60 years from donating organs, this age group has not been registered as a donor in this study, which may be because of their physical unfitness. It is important to note that the average life expectancy in Iraq is 69 years for men and 73 years for women during the year 2021 [10]. The prevalence of male donors surpassing females was anticipated and incorporated a revision to the findings of the studies of Al-Jebory, et al. in Baghdad and Al-Bazzaz in Erbil [11,12]. Both studies explored retrospective reviews of medical records. Kaul, et al., Katz-Greenberg & Shah, and Leal-Costa, et al. discovered a larger proportion of women than men in India, the USA, and Spain consequently [13-15]. Male predominance in this study may be coincidental, for which a larger sample is needed for future studies to confirm such findings. Also, the possibility that living with a single kidney can endanger future pregnancy may be behind women’s refraining from kidney donation more than their male counterparts. Abbasi & Al-Jasim’s study of 912 Iraqi teenagers found that women were significantly more represented in a deceased organ donation survey [16]. However, it is important to note that their study did not examine real donors and may have been affected by bias due to the electronic

Table 2: Given reasons for kidney donation and the donor-recipient relationship.

		No	%
Reasons for donation	Financial profit	6	3.6%
	Humanitarian (altruistic)	89	53.3%
	Social obligations	72	40.9%
Identified recipient	Yes	153	91.6%
	No	8	4.8%
	No answer	6	3.6%
Closely related recipient Not-related (friend, colleague, neighbour, acquaintance)	Yes	125	74.9%
	No	42	25.1%
	Brother/Sister	55	44.0%
	Father/mother	16	17.6%
	Nephew/niece	19	14.4%
	Husband/wife	16	9.0%
	Cousin	3	1.8%
	Uncle/aunt	9	5.11%
Receiving cash payment	Yes	3	1.8%
	NO	150	89%
No answer		14	8.4%
Amount of cash payment (IQD)	50,00000 equal to 38200\$	3	1.8%

**Figure 1:** Knowledge of the Iraqi kidney donors about kidney transplantation.

sampling methods. The finding that more than half of the participants were married and had children was unexpected, as this aspect has been seen as a deterrent to major surgeries such as kidney removal. Again, future studies on a larger sample are needed to confirm such influencing factors. The participants' comparatively high levels of education can be attributed to the accessibility of free education in schools and institutions [17]. Most of the recipients, 74.9%, were either immediate family members or distant relatives

of the donors, highlighting the significant influence of family bonds and cultural values in the decision to donate kidneys. This finding aligns with the results of a retrospective study conducted by Al-Tae, et al., where 89.6% of the 182 donors were found to be related. Other local studies, such as the one conducted by Ali, et al. (57.2%) and the study by Al-Jebory (55.7%), reported lower percentages [7,11,18]. It is worth noting that the former two studies were conducted in 2004 and 2007, suggesting a potential shift in donor motivations over

time. Despite the legal prohibition of organ trade, 1.8% of our participants admitted that they were promised a reward, usually cash money. Friedlaender was the first to report Palestinian patients who received KT from Iraqi donors in Baghdad, Iraq, while practicing nephrology in Israel during the late 1990s [19]. Keeping in mind the financial hardships caused by the economic sanctions imposed by the United Nations Security Council on Iraq on August 8, 1990, this led to the devaluation of the local currency and hyperinflation 800 times higher than before the sanctions [20]. In addition, the political turmoil and aftermath of the battle exacerbated their psychological and financial strain, undermining their psychological well-being [20]. Around a quarter of the participants were unemployed due to a lack of employment opportunities in the public sector. Many previous studies have demonstrated that kidney sales may be related to unemployment [12,17,19,21]. To shed further light on this uncertainty, it is hoped that future research will examine the complex interaction between sociodemographic characteristics and the kidney donation procedure. Another reason for the limited representation of financial gain is that most recipients were participants' families, where strong emotional bonds and social values played an important role in motivating kidney donation. Furthermore, the observation that most participants were able to meet their basic needs provides evidence of the prominent role of "altruism" as a key driver of donating their kidneys. The scarcity of donors is a significant obstacle in the field of transplantation. In many cases, it may not be possible to find a genetically compatible donor; however, there is still the possibility of receiving a kidney from an unrelated donor, such as someone who is emotionally connected or very motivated to donate. One should consider that the unique circumstances in Iraq may lead to an increase in commercial donors, therefore, it is important to implement steps to prevent the commercialization of kidney donation [21]. Being recruited from state healthcare institutions may lead individuals to refuse or avoid engaging in the practice of selling their kidneys to evade legal repercussions imposed by the law. Strong family bonds and social values were manifested by the higher prevalence of immediate family members in the donor-recipient relationship, in consistency with previous studies [12,18,22]. Owing to their education, most participants accessed the available data on KT. In addition, each donor received information leaflets about the process and consequences of transplant surgery from the Renal and Transplantation Committee Panel, while some participants were encouraged by observation of a healthy former donor, for unrelated recipients in particular, religious beliefs in particular, the idea of trusting Allah in the face of fear can be acknowledged as a crucial component of kidney donation. The results of this study present demographic information about kidney donors from Iraq. It is noteworthy that there is

a higher number of male donors, and their education and financial status do not align with similar studies conducted internationally, especially in developing countries where there may be cases of public or covert commercial organ transplantation. Therefore, it is crucial to conduct a thorough evaluation of potential donors before performing kidney transplant surgery. This study has uncovered the crucial significance of societal beliefs and familial obligations in influencing KD's decision to donate their kidneys. Nephrologists and transplant surgeons in Iraq are urged to address the lack of information by performing further research on living kidney donation, as it is the exclusive source of kidney transplantation [4,12,22] \pm S.D. 32.3 ± 5.4 (ranging from 18 to 43) years, The results of our study are consistent with previous research and indicate the need for bigger future studies, as supported by references [7,13,14,22,23].

Limitations of the Study

The major limitation was underreporting as some patients may have hidden information about getting paid for their donated kidneys. Another limitation was the decline in the number of transplant surgeries due to the lockdown caused by the COVID-19 pandemic in 2021. Another limitation is that the sample was recruited from public hospitals and not any private facility where more cases of KT are expected to be found, especially from paid, unrelated donors [23].

Conclusions

In a hospital environment, this study looked at the personal and demographic characteristics of KD. Most of KD were young, married males without jobs who volunteered to give their kidneys to their loved ones. She was driven more by compassion than by a need for money. The participants' comprehension of KT and the hazards linked to it was positive. impacted by their educational background. Rather than poverty, the participants' decisions were mostly affected by their cultural and religious beliefs. Iraq has continued to do small-scale kidney transplants despite several obstacles during the previous 40 years. However, to enhance and develop the present KT, Iraqi health authorities are urged to expand transplantation services throughout the country and encourage more young doctors to join the career of transplantation surgery.

Acknowledgment

The authors thank Riyadh K. Lafta, Distinguished Professor and Chairman of the Department of Community Medicine at the College of Medicine- Al Mustansiriyah university, Baghdad for his invaluable contributions in setting up the survey format and his help with statistical analysis.

Source of Support

None.

Author's Contribution

Authors contributed equally to this study.

References

1. Carney EF (2020) The impact of chronic kidney disease on global health. *Nephrology* 5: 251-252.
2. Kovesdy CP (2022) Epidemiology of chronic kidney disease: an update 2022. *Kidney International Supplements* 12: 7-11.
3. Al Sayyari AA (2008) The history of renal transplantation in the Arab world: a view from Saudi Arabia. *American J Kidney Diseases* 51: 1033-1046.
4. Adnan S (2012) Organ donation and islam-challenges and opportunities. *Transplantation* 94: 442-446.
5. Ali A (2021) Renal Transplantation in Iraq. *Transplantation* 105: 1131-1134.
6. Ali A, Al-Saedi AJ, Al-Mudhaffer AJ, Al-Taee KH (2016) Five years renal transplantation data: Single-center experience from Iraq. *Saudi Journal of Kidney Diseases and Transplantation* 27: 341-347.
7. Ali A, Al-Taee HA (2020) Knowledge and attitude towards organ donation among a sample of Iraqis in the city of Baghdad. *Transplantation* 104: S294.
8. Iraq (2023) The law of organ transplant.
9. Cost of Living in Baghdad (2023) Iraq.
10. World Bank Data: Iraq 2000-2021 (2024).
11. Al-Jebory HM, Abd KH, Mahmood S, Jabur WL, Al Khyat QJ (2007) Characteristics of kidney transplantation in Baghdad: An epidemiological study. *Saudi J Kidney Dis Transpl* 18: 432-438.
12. Al-Bazzaz PH (2010) Kidney transplantation in Erbil, Iraq: A single-center experience. *Saudi J Kidney Dis Transpl* 21: 359-362.
13. Kaul A, Bhaduarua D, Behera MR, Kushwaha R, Prasad N, et al. (2020) Psycho-social health and quality of life among kidney donors following transplantation. *Transplant Immunology* 74: 101649.
14. Katz-Greenberg G, Shah S (2022) Sex and gender differences in kidney transplantation. *Semin Nephrol* 42: 219-229.
15. Leal-Costa C, Ramos-Morcillo AJ, Martinez Zaragoza F, Bernabeu Juan P, Rodriguez-Marin J, et al. (2019) Personality and psychopathology in potential live kidney donors: A cluster analysis of personality features. *PLoS One* 14: e0221222.
16. Abbasi G, Al-Jasim A (2020) Attitudes, and perceptions among Iraqi young adults towards organ donation and transplantation: A call for action. *J Public Health Res* 9: 1857.
17. Soylu D, Soylu A, Yüzbaşıoğlu MF (2022) Determination of the factors affecting organ donation: Voluntary organ donors. *Transplant Immunology* 72: 101568.
18. Al-Taee SH, Iqdam K, Al-Shamaa I (2005) Long term follow-up of renal transplant patients -a single center experience in Iraq. *Saudi J Kidney Dis Transpl* 16: 40-45.
19. Friedlaender MM (2002) The right to sell or buy a kidney: Are we failing our patients? *Lancet* 359: 971-973.
20. Younis MS, Aswad A (2018) The impact of war and economic sanctions on the mental health system in Iraq from 1990 to 2003: A preliminary report. *Intervention* 16: 54-58.
21. Al-Taee H, Ali A (2022) Commercial kidney transplantation: Sociodemographic and clinical characteristics. *Transplantation* 106: S93.
22. Tushla L, Rudow DL, Milton J, Rodrigue JR, Schold JD, et al. (2015) Living-donor kidney transplantation: Reducing financial barriers to live kidney donation, recommendations from a consensus conference. *Clin J Am Soc Nephrol* 10: 1696-1702.
23. Rouchi AH, Mahdavi-Mazdeh M (2016) Kidney transplantation in the Middle East. *Clin Nephrol* 86: 101-105.