




## RESEARCH ARTICLE

## Demographic Profile and Viewpoints of Living Kidney Donors: An Example from Iraq

Maha Sulaiman Younis, MD, F.I.C.M.S, C.A.B.P<sup>1,2\*</sup>  and Omaima Khalid Yassen, MD, MB.Ch.B<sup>3</sup>

<sup>1</sup>Professor of Psychiatry, College of Medicine, University of Baghdad, Iraq

<sup>2</sup>Consultant Psychiatrist, Medical City Teaching Hospital, Baghdad, Iraq

<sup>3</sup>Psychiatric Registrar, Medical City Teaching Hospital, Baghdad, Iraq



\*Corresponding author: Maha Sulaiman Younis, Professor of Psychiatry, College of Medicine, University of Baghdad; Consultant Psychiatrist, Medical City Teaching Hospital, Bab Al-Moadham, Medical City Post Office, 11214, P.B: 61082, Baghdad, Iraq, Tel: 00964-7903210520, Fax: 00964-4223123

### Abstract

**Background:** Kidney transplantation is an advanced life-saving technique for treating patients with kidney failure. This procedure has been performed in Iraq since 1973 and relies on living kidney donors.

**Objectives:** This cross-sectional study aimed to examine the demographic characteristics of kidney donors in Iraq and to analyze their knowledge and motivations.

**Methods:** A descriptive cross-sectional study was conducted on kidney donors selected from the Renal Transplant Centers in two central teaching hospitals in Baghdad, Iraq. Participants were invited to complete a questionnaire paper form through face-to-face interviews from 2021 to 2022.

**Results:** In total, 176 kidney donors were included in this study. The mean age of the donors was  $32.3 \pm 5.4$  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% of the participants, 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 compensation for their contribution.

**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.

### Keywords

Demographic features, Kidney donors, Perspectives

### Introduction

Chronic kidney disease affects more than 10% of the total population and is one of the most common causes of death worldwide. They are usually associated with factors such as advanced age, female origin, 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)  $\leq 15$  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 a living donor [2]. The patient may or may not have a biological connection with the donor. Kidney donors (KD) 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, it faces numerous obstacles in Arab countries such as inconsistent health infrastructure, inadequate planning for organ procurement, and limited government support. 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. 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 [5,6]. The Iraqi government has implemented regulations to curb the potential for paid donations and organ trafficking. This included interviewing donors by 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, psychiatrist, and representatives from the (MoH) and the Ministry of Interior. The main task of this committee is to refute any allegations of commercial transactions and attribute the records to either the government or private hospital. 35 hemodialysis centers provide care for more than 6,000 individuals undergoing dialysis. Furthermore, a total of eight kidney transplant procedures were successfully conducted out of a pool of 5,000 transplants. Patients who underwent these transplants exhibited a 91% survival rate over 5 years, encompassing their overall well-being and the functionality of the transplanted organ [5,6]. The Renal Transplant Center attached to Medical City Teaching Hospital in Baghdad is the oldest and most comprehensive government facility of its kind. As of 2009, additional centers were established in other governorates. By the end of 2019, 5,950 kidney transplants were performed, 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 candidates who met their medical and administrative requirements were randomly selected. Every fourth person in the adjacent waiting area is selected. The second author visited the center twice a week to collect data. The selected participants readily agreed to participate in the study after receiving a detailed explanation of the study's aim and the confidentiality of their data. If a donor declined to participate, a subsequent donor was contacted. 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 second author repeated the same technique at the Renal Transplant Center affiliated with Al Karama Teaching Hospital between January 3 and December 1, 2022, after completing 104 datasets. Both medical facilities are located in Baghdad.

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 was 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 Medical City Hospital and 72 from Al-Karama Hospital. The response rate was 100% for all participants, all of whom were Muslims in Iraq. [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 male and 33.5%

**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	45	26.9
	No	122	73.1
Type of employment	Government	27	14
	Private	18	11.8
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

were female. 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. The unemployment rate in the sample was 73.1%, while 26.9% of the individuals had stable employment in the public and private sectors. A total of 85.6% of participants described their financial status as “fair,” estimated at 500,000-2,000,000 Iraqi Dinars (IQD)/month, and 11.4% had a “good” level of more than 2,000,000 IQD/month [9]. In addition, 45.5%, and 28.7% of the participants owned their houses and their cars.

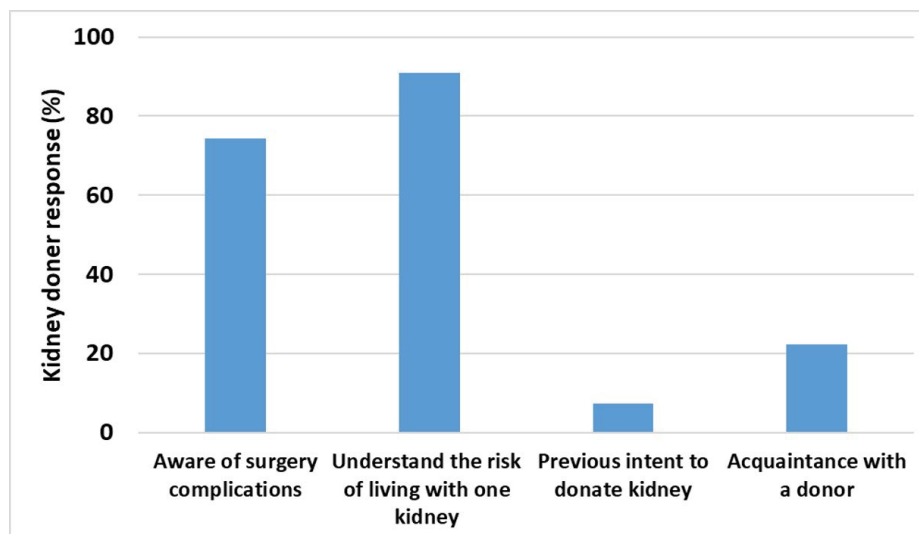
Table 2 shows that 3.6% of participants were motivated by financial gain, while 53.3% and 37.1% of participants were motivated by altruism and social

responsibility, respectively. 91.6% of the 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% of the beneficiaries, 44.0% were siblings, whereas 17.6%, 14.4%, and 9.6% were parents, nephews, nieces, and spouses, respectively. 89.8% of the respondents, 89.8% 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 difficulties, 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.

**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	62	37.1
	No answer	10	6.0
Identified recipient	Yes	153	91.6
	No	8	4.8
	No answer	6	3.6
Closely related recipient	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	12	9.6
	Cousin	3	1.8
	Uncle/aunt	5	3.2
	Non-related	8	
Receiving cash payment	Yes	3	1.8
	No	150	89
	No answer	14	8.4
Amount of cash payment (IQD)	50,00000		

**Figure 1:** Awareness of potential problems.

## Discussion

This study examined the personal attributes of 176 potential living donors with a mean age  $\pm$  S.D.  $32.3 \pm 5.4$  (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. While there is no specific law in Iraq that forbids those aged 60 and above from donating organs, this age group has not been registered as donors because of their fragile health condition. It is important to note that

the average life expectancy in Iraq is 69-70 years 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 the cause behind women's refrain 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. 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 sampling methods [16]. 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]. However, the high unemployment rate contradicts the level of education achieved, which is due to a lack of employment opportunities in the public sector and reflects the specifics of the toil market in Iraq. Previous studies have demonstrated that kidney sales may be related to unemployment [6,12,18]. 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. Despite the legal prohibition of organ trade, 1.8% of participants admitted that they were promised a reward usually cash. 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]. 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. 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 consistency with previous studies [12,18,21]. 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 the 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 [4,11,12,22].

### 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 number of transplant surgeries due to the lockdown caused by the COVID-19 pandemic in 2021.

### Conclusions

In a hospital environment, this study looked at the personal and demographic characteristics of KD patients. The bulk of volunteers 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 with 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, Iraq health authorities are urged to expand the transplantation services along the country and encourage more numbers of young doctors to join the career of transplantation surgery [5,6,18,22].

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## Author's Contributions

All authors contributed equally to the design, collection, and revision of references and writing of the final manuscript.

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