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# Psychosocial Evaluation of Prospective Living Kidney Donors in Qatar: A Profile of Prospective Donors, Process, and Outcomes

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**Background.** In Qatar, the Committee for Oversight of Living Donation (COLD) was established at Hamad Medical Corporation in 2014 to provide standardized, multidisciplinary psychosocial evaluation (PE) for prospective living kidney donors (PLKDs) and ensure appropriate care throughout evaluation, donation, and postdonation follow-up, consistent with legal and ethical standards. We describe the COLD protocol and report PE outcomes of PLKDs in Qatar. **Methods.** A retrospective observational cross-sectional study was conducted using case file data of PLKDs assessed at Hamad Medical Corporation between August 2014 and December 2022. Descriptive statistics analyzed demographics and outcomes of COLD evaluation. **Results.** Eight hundred ninety-eight PLKDs (54% men) were enlisted for 545 transplant candidates. Four hundred forty-seven PLKDs (49.8%) were Qatari; the remainder were noncitizen residents representing 43 nationalities. Most 680 PLKDs (76%) claimed a genetic relationship with recipients; 20% were emotionally related and 4.34% were unrelated. Of those who proceeded with evaluation, 88% (n = 788) were accepted, 7.5% were declined, and 4.8% dropped out. Of those who were declined (n = 67), 81% were noncitizen residents; 42% claimed an emotional relationship with the intended recipient, whereas 34% were unrelated and 24% were genetically related. The main reasons for declining a PLKD were insufficient socioeconomic support, psychological unfitness, and coercion by employers or family. **Conclusions.** Standardized structured PE has been effective in identifying and addressing risk factors across various PLKD demographics in Qatar. This study highlights the importance of comprehensive evaluation for all PLKDs, regardless of nationality or relationships with recipients. The COLD protocol could serve as a valuable tool for PE of PLKDs in other countries.

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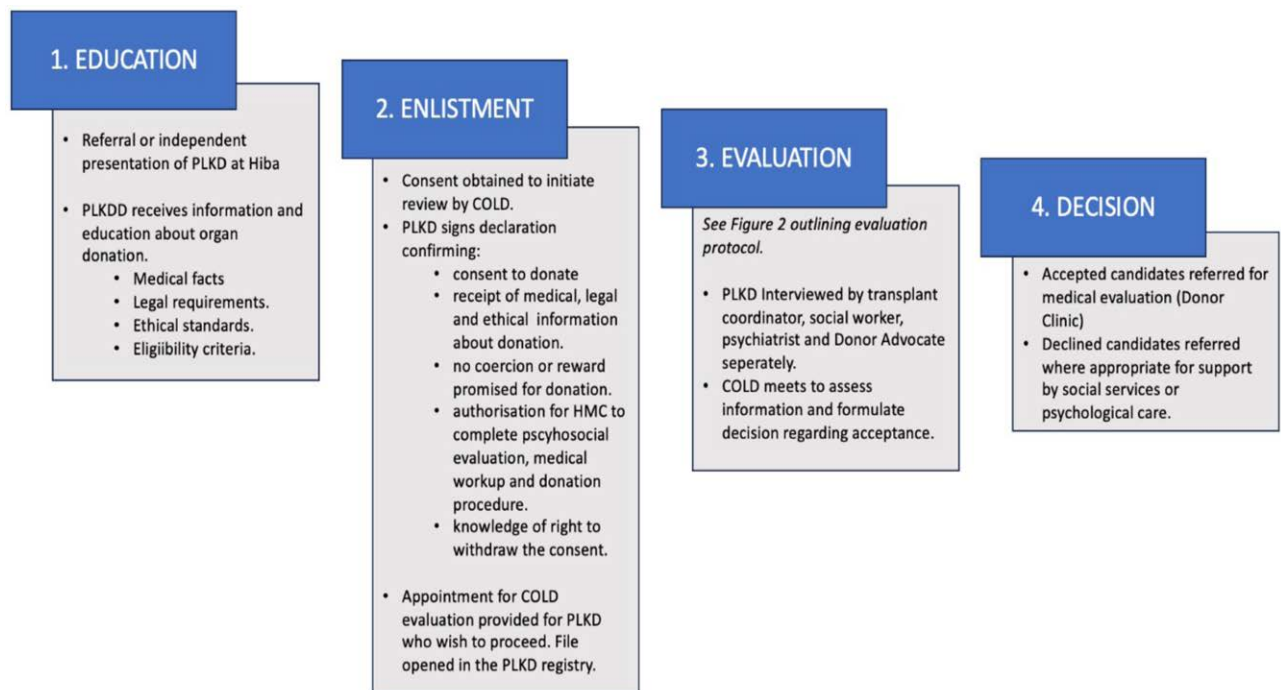
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**Q**atar is a wealthy, multicultural country with a multinational resident population of 2.65 million people, representing approximately 94 nationalities.<sup>1</sup> In 2010, Qatar's national public health provider, Hamad Medical Corporation (HMC), launched the Doha Donation Accord (DDA), a policy that aimed to establish deceased and living organ donation programs. The Accord was aligned with the Declaration of Istanbul on Organ Trafficking and Transplant Tourism and the World Health Organization's Guiding Principles for transplantation.<sup>2</sup> Implementation of the Accord has resulted in major achievements, including a multinational donor registry numbering 500 000 registrants in mid-October 2022, a multinational transplant waiting list with equitable access for noncitizen residents,<sup>3-5</sup> and multilingual and multicultural education campaigns to promote donation. These initiatives led to increases in deceased donation from 0.71 per million population (pmp) in 2009 to 7.41 pmp in 2023 and in living donor kidney transplants from 0.71 pmp in 2009 to 17.78 pmp in 2022.<sup>5-7</sup>

Like many countries, Qatar's living donors provide the majority of kidneys for transplantation due to an insufficient supply of organs from deceased donors.<sup>7</sup> Transplants from living donors may also provide better clinical outcomes for recipients, for example, by facilitating early opportunities for transplantation,<sup>8</sup> as well as benefits for donors.<sup>9</sup> However,



**FIGURE 1.** PLKD pathway. PLKD, prospective living kidney donor.

living donation also poses physical and psychosocial burdens and risks for donors,<sup>10–12</sup> necessitating careful screening and assessment for risk management. Several international frameworks and guidelines highlight the importance of assessing prospective living donors, excluding those for whom risks are deemed excessive, providing appropriate care during and after donation, and collecting data to inform practice.<sup>13–15</sup> However, little evidence-based guidance is available regarding best practices in psychosocial evaluation (PE) of prospective donors. In particular, little is known of strategies used to identify and manage prospective donors at risk of exploitation, coercion, or organ trafficking, which will be influenced by local socioeconomic, cultural, and healthcare system factors. Reports of organ trafficking typically reveal failures to prospectively detect and manage such risks before donation and transplantation, highlighting the need to establish and implement standards for PE that are informed by an understanding of local contexts.<sup>16</sup>

Supporting the growth of living donation in Qatar while respecting the ethical standards of the Doha Accord and the Qatari Transplant Law has required substantial, innovative, and sustained efforts to prevent trafficking and ensure effective care of potential donors.<sup>2,17</sup> Foreign nationals comprise the majority of residents in Qatar, predominantly laborers on employer-sponsored working visas who are vulnerable to coercion and exploitation.<sup>18</sup> Furthermore, many are from countries where organ trafficking remains prevalent, and they may be familiar with trafficking as a perceived means to address financial crises.

Before the Accord, most Qatari patients sought commercial transplantation overseas<sup>19</sup>; hence, a cultural shift to related altruistic donation was needed. (In this article, the term “altruistic” refers to donation based on the desire to help others, specifically excluding motivations of financial or other material gain.) Cultural norms within some families in Qatar may also increase the risk of intrafamilial coercion or

undue influence on female prospective donors,<sup>20</sup> as observed in other countries.<sup>21</sup> Finally, the dynamic multinational population means that many residents may have family living abroad, necessitating international travel of relatives to Doha for donation or transplantation with associated complexities in evaluation of prospective donors and recipients.<sup>22</sup>

In 2014, HMC therefore established the Committee for Oversight of Living Donation (COLD), which is responsible for the PE of prospective living donors. HMC is the only institution authorized to perform living kidney donation and transplantation in Qatar. The inaugural COLD policy outlined a process (Figure 1) and standards for evaluation and decision-making about acceptance of living donors, which are applicable to all prospective donors in Qatar, regardless of their nationality or other characteristics. That is, evaluation by the COLD is legally mandated for all living donors in Qatar. In this article, we aim to provide insights that may inform practice in other countries and future international guidelines by briefly describing the COLD protocol and reporting the outcomes of PE of prospective living donors during 8 y (2014–2022).

## MATERIALS AND METHODS

A retrospective, observational, and descriptive cross-sectional study was conducted at HMC in 2022 using data from case files collected in the prospective living donor registry hosted by the Qatar National Organ Donation Centre, “Hiba.” Ethics approval for the study was received from the Medical Research Centre at HMC (Ref. MRC-01-23-052).

### Sample Population and Data Collection

The majority of prospective living kidney donors (PLKDs) in Qatar are referred by nephrology clinics to Hiba, which

is co-located in the dialysis center building at HMC, after expressing interest in donation while accompanying a relative receiving dialysis or a preemptive end-stage kidney failure patient. Others may present independently to Hiba, accompanied by a transplant candidate or alone when seeking to donate without an intended recipient. Where several individuals present as prospective donors for a transplant candidate, they typically undergo concurrent PE.

All case files of individuals entering the PLKD pathway (Figure 1) at Hiba between August 2014 and December 2022 were reviewed, and data were manually extracted and documented in a Microsoft Excel database. Data collected included prospective donor demographics, asserted relationship with the intended transplant recipient, and outcome of the COLD evaluation process (acceptance or decline as a potential donor; see **Form S1, SDC**, <http://links.lww.com/TXD/A748>) described in Figure 2.

### The PE Program for PLKDs in Qatar: The COLD Protocol

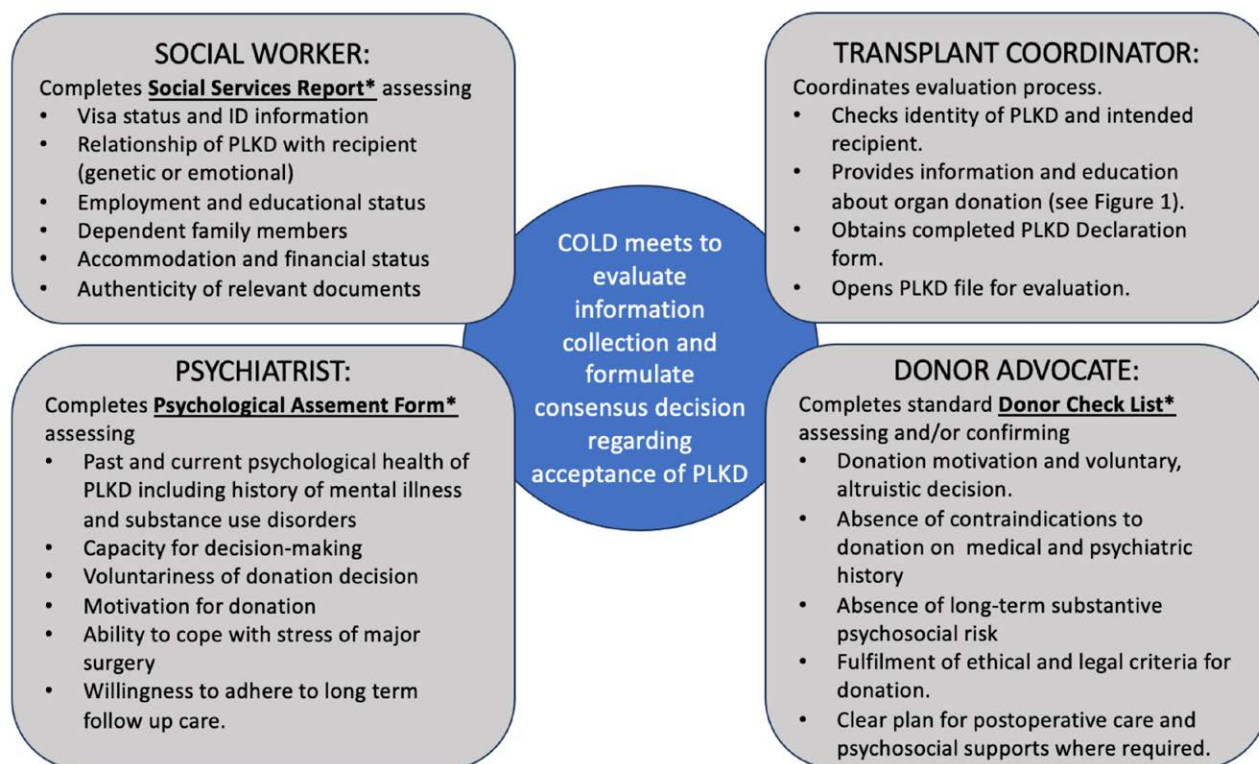
The designated COLD team includes 2 transplant coordinators, 1 female and 1 male senior psychiatrist, 1 male and 1 female social worker, and a donor advocate. All members are HMC staff who are given dedicated time to fulfill their COLD duties. The Committee convenes weekly.

As shown in Figure 1, the PLKD typically completes steps 1 (education) and 2 (enlistment) of the COLD protocol during their first presentation to Hiba (see **Form S2, SDC**, <http://links.lww.com/TXD/A748>). They subsequently receive an

appointment to return and undergo face-to-face interviews (step 3; evaluation) with individual members of the COLD (social worker, donor coordinator, psychiatrist, and donor advocate) on the same day. This appointment typically lasts for 2 h. The social worker, psychiatrist, and advocate each conduct a face-to-face structured interview exploring the topics covered in center-developed standard forms and checklists (see **Forms S3–S5, SDC**, <http://links.lww.com/TXD/A748>), consistent with the approach of many American programs.<sup>23</sup> Specific psychological assessment tools, such as the Generalized Anxiety Disorder Scale, are used only when indicated in individual cases. The psychiatrist's evaluation will also be informed by a review of the PLKD's mental health record, if extant, and the social worker may ask specific questions based on documentation of the individual's employment, migration status, and banking records. Notably, psychologists are not used, in part because currently, only psychiatrists have access to national mental health records.

After interviews are completed, relevant data and documentation are collected and reviewed by members of the Committee (see Figure 2). The COLD then meets to discuss evaluation reports and reach a unanimous decision on each PLKD; each committee member has a veto right. Sometimes, the decision is made to repeat steps in the evaluation process before reaching a decision on the acceptance or decline of the prospective donor.

Decisions to decline a PLKD may be determined by specific factors excluding individuals, for example, on legal grounds, such as evidence of false or inconsistent documentation



\*See Appendix for tools used in documentation of standard assessments.

**FIGURE 2.** Components of psychosocial evaluation of PLKDs performed by the COLD. COLD, Committee for Oversight of Living Donation; PLKD, prospective living kidney donor.



misrepresenting relationships or identity. They may also be based on a psychiatrist's clinical assessment that a mental health condition, for example, severe depression, currently represents a substantial nonmodifiable risk of harm or that an individual is unable to provide valid consent. Some decisions may be based on the collective weight of information from multiple sources, for example, supporting suspicions of trafficking or coercion. For example, the social worker may note a precarious financial situation, the donor advocate may observe an undue level of anxiety about the evaluation process, and the psychiatrist may be unconvinced by the motivations for donation expressed by the PLKD.

The Committee's decision is communicated (step 4) to the PLKDs, and those accepted are referred to the donor clinic for medical evaluation (ME). Some declined candidates are referred to appropriate social services or psychological support. The COLD maintains an ongoing connection with PLKDs after acceptance. Where concerns are raised during the process of ME, a candidate may be referred back to the COLD for reevaluation. Members of the COLD also provide ongoing psychosocial support for eventual donors.

### Analysis

Where a prospective donor was declined, notes documenting reason(s) for the decline were reviewed by 2 members of the research team who agreed by consensus on the assignment of categories reflecting the primary concerns raised during the COLD evaluation. Descriptive statistics were used to analyze the proportions and frequency of variables. Outcomes for those accepted after COLD evaluation were defined as:

1. Withdrawal because
  - a. Intended recipient unfit for transplant.
  - b. PLKD medically unfit for donation.
  - c. Intended recipient received deceased donor kidney transplant.
  - d. Another PLKD selected for donation.
  - e. Intended recipient sought transplantation outside Qatar.
2. Dropped out: PLKD who voluntarily withdrew from the program or failed to attend further consults in the absence of a withdrawal rationale as defined earlier.
3. Donated or awaiting donation.

## RESULTS

Between September 2014 and December 31, 2022, 898 individuals were enlisted in the PLKD registry, of whom 855 completed the COLD evaluation process (Figure 3).

### Demographics

Non-Qatari citizens representing 43 different nationalities comprised 50.2% (n = 451) of the study group as shown in Table 1. The majority of PLKDs (73.49%; n = 660) were aged between 18 and 40 y and had completed secondary or tertiary education (87.41%; n = 785), as shown in Table 2. Most were men (54.23%; n = 487), with similar gender proportions observed in Qatari and non-Qatari populations.

### Relationships Between PLKDs and Intended Transplant Recipients

The majority of PLKDs (76%; n = 680) claimed a genetic relationship with their intended transplant recipient (eg,

biological sibling, parent, child) that was supported by documentary evidence (eg, national identity cards, passports, birth certificates), as shown in Table 3. Nearly 20% (n = 179) claimed an emotional relationship substantiated by PE, of whom 88.82% were spouses (n = 159), compared with 19 friends and 1 neighbor; wives comprised the majority of prospective spousal donors (57.54%; n = 103). A minority (n = 39; 4.34%) presented as ostensibly "altruistic" donors lacking an emotional or biological relationship with the intended recipient; of these, 23 intended to direct their donation (eg, to an employer, stranger soliciting donors via social media), whereas 16 were "non-directed" donors, seeking to donate to anyone requiring a transplant.

On average, 1.56 PLKDs presented for each of the 545 identified transplant candidates; however, the majority of PLKDs (64.95%; n = 354) presented as single candidates for donation. Qatari transplant candidates were more likely to have multiple PLKDs; 49.54% of Qatari candidates (n = 108) presented with 1 PLKD, 28.89% with 2 PLKDs, 17.43% with 3–4 PLKDs, and 4.12% with >5 PLKDs. In contrast, most non-Qatari candidates presented with a single donor (75.23%; n = 246); 20.49% presented with 2 PLKDs and 4.28% presented with 3–6 PLKDs.

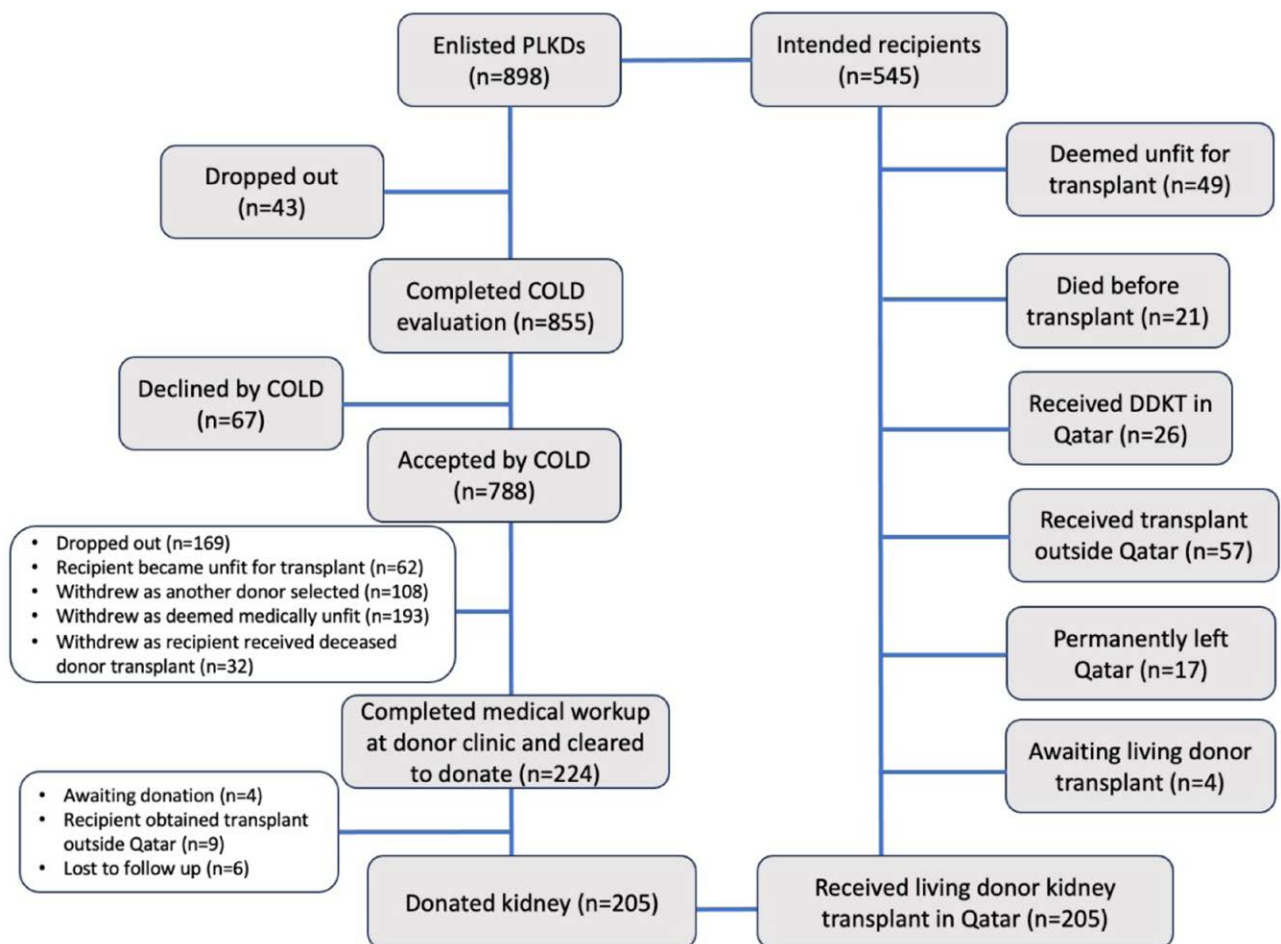
### Outcomes of PE

Table 2 and Figure 3 show the outcomes of COLD evaluation for the enlisted PLKDs. In total, 87.75% (n = 788) PLKDs were accepted, 7.46% (n = 67) were declined, and 4.78% dropped out before completing the evaluation. The annual proportion of declined PLKDs ranged from 2% to 12%.

As shown in Table 2, a higher acceptance rate (90.75%; n = 373) was observed in female PLKDs; those declined were more frequently men, of lower educational status, and working as manual laborers. The overall acceptance rate for enlisted Qatari PLKDs was 92.17% (n = 412), compared with 83.37% for non-Qatari PLKDs (n = 376). The majority of accepted PLKDs were genetically related to their intended recipient (80.45%; n = 634) or emotionally related (18.14%). No unrelated directed PLKDs were accepted, and only 68.75% (n = 11) of nondirected altruistic PLKDs were accepted. All declined Qatari PLKDs had intended to donate to Qatari recipients, whereas 62.96% (n = 34) of declined non-Qatari PLKDs had intended to donate to a recipient of a different nationality than their own.

Multiple reasons for declining a PLKD were documented in some cases; however, coercion was the most prevalent primary reason for the decline, documented in 29.85% (n = 20) of declined cases (see Table 4). The majority of PLKDs declined because of suspected familial coercion were women (71.4%; n = 5), whereas men comprised the majority of those declined due to suspected employer coercion (92.3%; n = 12). Of the 14 low-income workers declined, 8 were declined because of coercion by employers, 5 because of socioeconomic concerns, and 1 was deemed psychologically unfit.

Of the 67 declined PLKDs, 28.35% (n = 19) were declined because of concerns that their employment and economic status placed them at disproportionate risk of economic harm from donation or exploitation for organ trafficking. 25.37% (n = 17) were declined as psychologically unfit (eg, experiencing a major depressive episode), of whom most were Qatari (n = 11); 10.44% (n = 7) had falsified work documents or



**FIGURE 3.** Outcomes for PLKDs and intended transplant recipients enlisted by the COLD. COLD, Committee for Oversight of Living Donation; PLKD, prospective living kidney donor.

lacked legally valid residency documents or evidence supporting a claimed relationship with their intended recipient; 5.97% ( $n = 4$ ) were declined when a medical contraindication to donation was revealed during COLD evaluation.

### Donation Outcomes for PLKDs

Of those accepted by the COLD ( $n = 788$ ), 26.01% proceeded to donate, or 22.82% of all 898 enlisted in the PLKD registry (Table 3). The outcomes for other PLKDs accepted by COLD are shown in Figure 3: 24.49% were declined for medical reasons, 21.44% dropped out, 13.7% withdrew when another PLKD was selected, and others withdrew when their intended recipient became unfit for transplant (7.86%) or received a deceased donor transplant (4.06%). Overall, female donors comprised 55.60% ( $n = 114$ ) of total actual donors, 48.05% ( $n = 37$ ) of actual Qatari donors (77), and 60.15% ( $n = 77$ ) of actual non-Qatari donors. Table 3 shows the outcomes for all enlisted Qatari and non-Qatari PLKDs for each relationship type.

### Outcomes for PLKDs Nonresident in Qatar

A total of 77 individuals from 12 countries outside Qatar sought access to the HMC donation program, which provides sponsored travel to enable donations to a first-degree relative resident in Qatar. Forty-three were declined, primarily due to medical reasons, after pretravel screening

(online COLD evaluation and preliminary medical check); 34 traveled to Doha and were enlisted as PLKDs, where the complete COLD evaluation and ME were repeated. Of these, 1 PLKD was declined by the COLD, and a further 7 were declined because of medical reasons, with 26 eventually donating.

### DISCUSSION

PE is sometimes considered a gatekeeping step aimed at risk management, with PLKDs deemed at higher risk of poor psychosocial outcomes from donation or organ trafficking selected for evaluation. The COLD protocol instead provides comprehensive oversight of the living donation program, incorporating education for prospective donors, identifying and addressing modifiable risk factors, and supporting PLKDs and their intended recipients throughout the evaluation process. Risk management is a key consideration, but optimizing care for PLKDs and removing barriers to living donor transplantation are primary aims of the protocol.

Few transplant programs have published details regarding their protocols for PE of PLKDs<sup>24,25</sup> or reported outcomes of such evaluation with respect to acceptance of prospective donors.<sup>26,27</sup> Many programs perform PE of prospective donors only after medical clearance and only in the case of specific donor-recipient relationship categories.<sup>23</sup> Furthermore,

**TABLE 1.**  
**Demographics of PLKDs in Qatar**

Demographics	n	%
Nationality		
Qatari	447	49.8
Non-Qatari	451	50.2
Non-Qatari nationalities		
Sudanese	75	8.35
Filipino	44	4.89
Egyptian	41	4.56
Pakistani	37	4.12
Yemeni	35	3.89
Indian	31	3.45
Palestinian	27	3.00
Jordanian	27	3.00
Syrian	14	1.56
Saudi Arabian	12	1.33
Sri Lankan	11	1.22
Other nationalities with <10 PLKDs <sup>a</sup>	97	10.80
Sex of Qatari PLKDs (n = 447; 100%)		
Female	199	44.51
Male	248	55.48
Sex of non-Qatari PLKDs (n = 451; 100%)		
Female	212	47.0
Male	239	52.99
Sex of Qatari PLKDs + non-Qatari PLKDs (N = 898)		
Female	411	45.76
Male	487	54.23
Age, y		
18–30	332	36.97
31–40	328	36.52
41–50	166	18.48
51–60	63	7.01
61–68	9	1

<sup>a</sup>Algerian, American, Armenian, Bahraini, Bangladeshi, Brazilian, British, Djiboutian, Emirati, Eritrean, Ethiopian, Gambian, Iranian, Indonesian, Iraqi, Kenyan, Kuwaiti, Lebanese, Malaysian, Mauritanian, Mexican, Moroccan, Mozambique, Nepali, Nigerian, Omani, Russian, South African, Tunisian, Turkish, Ugandan, Zimbabwean.  
PLKD, prospective living kidney donor.

multiple PLKDs presenting for a transplant candidate are often evaluated consecutively rather than concurrently.<sup>28</sup> Consequently, this single-center study provides a rare comprehensive overview of PLKD demographics and the outcomes of a specific PE protocol in a multicultural population. It may also inform revisions to donor evaluation programs where PE currently follows ME or PE is performed ad hoc by providing insights into the potential proportion of PLKDs who progress through to donation and thus informing estimates of associated costs of more systematic PE.

### Profile of Living Kidney Donors in Qatar

The results reveal the demographics of those volunteering and actually donating kidneys in Qatar, demonstrating a rapid evolution in the culture of donation. In 8 y, the annual number of PLKDs enlisted has increased from 23 to 129, and the profile of prospective donors indicates that willingness to donate is not restricted to specific nationalities. The diversity of PLKDs is consistent with that of transplant candidates in Qatar.

This support for altruistic donation is striking, given that most neighboring countries offer explicit financial rewards for donation or are grappling with organ trafficking.<sup>29–33</sup> Furthermore, the majority of the resident population of Qatar comprises migrants from South Asia,<sup>1,34</sup> a region in which organ trafficking is notoriously widespread.<sup>35–38</sup> Although most residents are young male migrant workers who undergo health screening before arrival,<sup>34</sup> there is sufficient demand for kidney transplantation among noncitizen residents for this population to comprise nearly half of PLKDs. The provisions of the DDA offer noncitizen residents an opportunity for living donor transplantation that may be unavailable in their countries of origin, as indicated by the number of cases in which relatives traveled to Doha to donate to a resident recipient.

Migrant workers are at risk of exploitation, both as victims of human trafficking for organ removal and also within legal systems of paid or “rewarded” “donation.”<sup>35</sup> This study confirms the vulnerability of some workers and demonstrates the potential efficacy of PE in preventing their exploitation as a source of organs for transplantation. Those declined in PE were more likely to be men, of lower educational status, and working as manual laborers. Although laborers comprised only 4.0% (n = 36) of the total PLKDs, they represented 20.89% of those declined. As shown in Table 2, 38.88% of laborers (n = 14) seeking to donate were declined, with employer coercion as the most common reason.

Notably, 59% (n = 23) of unrelated altruistic PLKDs were declined and 13% dropped out; all those who intended donation to a known but unrelated individual were declined, in some cases due to evidence of coercion or commercial motivations. Only 2 (5%) became donors, making nondirected donations.

The results indicate a relative gender balance in the prospective and actual living donor populations, specifically among Qatari donors. Worldwide, female donors tend to outnumber male donors<sup>39</sup>; however, female donors comprised only 44.51% (n = 199) of Qatari PLKDs and 48.05% (n = 37) of actual Qatari donors. It is unclear what underpins this result, given limited research on public attitudes in Qatar toward living donation and the relative youth of the donation program. Results for non-Qataris were more consistent with global trends, with female donors comprising a slight minority of non-Qatari PLKDs (47%; n = 212) and a majority (60.16%; n = 77) of actual donors. Migrants may be less likely to have female relatives also residing in Qatar as the non-Qatari resident population is majority men,<sup>40,41</sup> and women may face fewer biological barriers to donation,<sup>42</sup> which could explain this finding.

### Timing of PLKD Evaluation and Concurrent Screening of Multiple Donor Candidates

Potential inefficiencies in PLKD evaluation are a concern due to the economic costs of evaluation procedures, the potential psychosocial burdens of evaluation, and the potential impact of delays on dropouts and access to living donor transplants, which may negatively impact transplant candidate health outcomes.<sup>43–45</sup> In Qatar, completing PE of PLKDs before formal ME could appear inefficient as only 8% (n = 67) of those who completed the COLD assessment were declined on psychosocial grounds, whereas 23% (n = 193) were ultimately declined as unfit after ME. Completing ME before PE, as commonly occurs in the United States for related PLKDs,<sup>23</sup> might therefore reduce the incidence of unnecessary evaluations by the COLD.

**TABLE 2.****Outcomes of psychosocial evaluation**

	Enlisted (N = 898; 100%)	Accepted (N = 788; 87.75%)	Declined (N = 67; 7.46%)	Dropped out (N = 43; 4.78%)
Nationality				
Qatari	447	412 (52.28%)	13 (19.4%)	22
Non-Qatari	451	376 (47.71%)	54 (80.59%)	21
Sex				
Female	411	373 (47.33%)	18 (26.86%)	20
Male	487	415 (52.66%)	49 (73.13%)	23
Highest educational qualification				
No formal schooling	13	6	4	3
Primary school	67	57	10	0
Secondary school	313	284	19	10
Tertiary education	472	432	32	8
Data not available	33	9	2	22
Current occupational type				
Administrative/technical role	202	179 (22.71%)	13 (19.40%)	10
Home maker	174	158 (20.05%)	10 (14.92%)	6
Managerial/executive/professional role	262	248 (31.47%)	11 (16.41%)	3
Military services	102	95 (12.05%)	5 (7.46%)	2
Manual laborer	36	21 (2.66%)	14 (20.89%)	1
Not working/retired/student	80	69 (8.75%)	8 (11.94%)	3
Data unavailable	42	18 (2.28%)	6 (8.95%)	18
Relationship with intended recipient				
Genetically related	680	634 (80.45%)	16 (23.88%)	30
Female	295	277 (35.5%)	4 (5.970%)	14
Male	385	357 (45.30%)	12 (17.91%)	16
Emotionally related	179	143 (18.14%)	28 (41.79%)	8
Female	111	92 (11.67%)	13 (19.40%)	6
Male	68	51 (6.47%)	15 (22.38%)	2
Directed altruistic (unrelated)	23	0	21	2
Female	1	0	1	0
Male	22	0	20	2
Nondirected altruistic	16	11 (1.39%)	2 (2.98%)	3
Female	4	4 (0.50%)	0	0
Male	12	7 (0.88%)	2 (2.98%)	3

**TABLE 3.****Asserted relationship between enlisted PLKDs and intended recipients**

Claimed relationship	Enlisted PLKDs			Actual donors <sup>a</sup>		
	Total, n (%)	Qatari, n (%)	Non-Qatari, n (%)	Total, n (%)	Qatari, n (%)	Non-Qatari, n (%)
Genetically related	680 (75.72%)	391 (57.5%)	289 (42.5%)	169 (26.65%)	66 (39.05%)	103 (60.94%)
Female	295 (43.38%)	166 (42.25%)	129 (44.63%)	84 (49.7%)	28 (42.42%)	56 (54.36%)
Male	385 (56.61%)	225	160	85	38	47
Emotionally related <sup>b</sup>	179 (19.93%)	49 (27.37%)	130 (72.62%)	34 (23.77%)	11 (32.35%)	23 (67.64%)
Female	111 (62.01%)	32	79	29	9	20
Male	68 (37.98%)	17	51	5	2	3
Directed altruistic (unrelated)	23 (2.56%)	3 (13%)	20 (86.95%)	0	0	0
Female	1 (4.34%)	0	1	0	0	0
Male	22 (95.65%)	3	19	0	0	0
Nondirected altruistic	16 (1.78%)	4 (25%)	12 (75%)	2 (18.18%)	0	2 (100%)
Female	4 (25%)	1	3	1	0	1
Male	12 (75%)	3	9	1	0	1
Total	898 (100%)	447 (49.77%)	451 (50.22%)	205 (22.83%)	77 (37.56%)	128 (62.44%)

<sup>a</sup>Donated 205 transplants from 91 male and 114 female PLKDs.<sup>b</sup>Wife to husband (n = 103), husband to wife (n = 56), to friend (n = 18), and to neighbor (n = 1). PLKD, prospective living kidney donor.

Comparison of the living donor evaluation process in Qatar with that of other programs is difficult because many programs do not conduct PE for all prospective donors, and

it is frequently unclear how psychosocial or medical exclusion criteria are assessed on screening activities early in the evaluation process.<sup>23,46</sup> However, several reasons underpinning the



**TABLE 4.**  
**Primary reason for declining a PLKD following COLD evaluation**

Primary reason for COLD decision to decline	N = 67, %	Nationality		Sex	
		Qatari	Non-Qatari	Female	Male
Precarious situation E.g., High risk of economic harm from donation or vulnerability to trafficking	28.4%	1	18	2	17
Psychologically unfit E.g., Major depressive episode	25.37%	13	4	7	10
Legal barrier E.g., Invalid documentation	10.14%	1	6	2	5
Coercion	29.54%	1	19	6	14
By employer	19.40%	0	13	1	12
By family	10.14%	1	6	5	2
Medically unfit	5.9 %	1	3	1	3

COLD, Committee for Oversight of Living Donation; PLKD, prospective living kidney donor.

prioritization of PE in Qatar's model may be applicable in other settings.

Exposing more PLKDs to the coordinated, multidisciplinary COLD process reduces the number who undergo the more time-consuming, physically invasive, burdensome, and costly process of ME. This is consistent with ethical obligations to minimize harm and may be more efficient overall. In addition, prioritizing PE allows an initial assessment of PLKD motivations that is unbiased by the knowledge that the donor candidate is medically fit to donate to their intended recipient. Candidates may be more comfortable disclosing hesitation or concerns about medical risks if they are free of knowledge that could indicate they are the only suitable match for the transplant candidate or that they lack clear contraindications to donation. After ME, reluctant donors may find it easier to request a medical alibi if necessary,<sup>47</sup> or to appraise the medical risks of donation as too great to proceed. In contrast, if they are “medically cleared” before PE, a subsequent decision to decline donation—or being declined on the basis of PE—may be perceived as a psychological failing on the part of the PLKD or as evidence of reluctance to donate on their part. Prioritizing PE could thus contribute to respect for the autonomy of PLKDs and reduce the risk of coercion.

The use of concurrent evaluation when multiple PLKDs present for a single transplant candidate is also a feature of the COLD protocol that may raise concerns about efficiency, given the high number of PLKDs presenting for many Qatari candidates. Large families with strong intrafamilial obligations are a feature of Qatari society, and the robust culture of donation that has developed may explain the high number of multiple donors. Although there are costs for HMC associated with the COLD assessment, research in the United States has shown that concurrent screening is often more cost-effective, for example, by avoiding delays to transplantation.<sup>48</sup> However, in other programs where PE nominally precedes ME, PE may not always be performed or may be limited, for example, with the use of a psychosocial screening questionnaire rather than a comprehensive multidisciplinary assessment.<sup>28,49</sup>

Evaluation of multiple PLKDs is often necessary for Qatari transplant candidates, given difficulties in finding a suitable match for those with high panel-reactive antibody levels. Concurrent evaluation offers additional potential benefits, for example, by reducing bias in the early stages of donor selection. If PLKDs are selected for PE on the basis of assumptions

about medical risk factors, for example, this could lead to overselection of female prospective donors given the higher proportion of male donors with such risk factors. Concurrent evaluation also facilitates the evaluation of family dynamics and may reduce pressure on individual candidates for donation. Finally, concurrent evaluation helps to avoid the typically higher costs associated with ME of a PLKD who then declines or is deemed unfit on psychosocial grounds for donation.

### Outcomes of PLKD Evaluation

Consistent with findings from similar studies, this study shows that a relatively small proportion of PLKDs proceed to become actual donors. In our study, 22.82% of all enlisted PLKDs (*n* = 205) eventually donated, compared with 29.04% of registered donor candidates (*n* = 612) in a United States study,<sup>26</sup> 26.32% (*n* = 104) in a Portuguese study,<sup>50</sup> 18.41% (*n* = 176) in Ireland,<sup>51</sup> and 13.91% (*n* = 112) in the United Kingdom.<sup>52</sup> In contrast, a study from Saudi Arabia reported a nephrectomy rate of 58.5% (*n* = 241) among PLKDs.<sup>53</sup> Comparative analysis of such outcomes is difficult given differences within countries and between individual donation programs with regards to the sequence of evaluation steps, use of concurrent or sequential screening, and availability of deceased donor transplants that may lead PLKDs to drop out, as well as substantial variation in PE protocols. In a German study, for example, medical contraindications were the reason for disqualification of 50.7% of PLKDs,<sup>54</sup> whereas 24.49% (*n* = 193) of PLKDs accepted by COLD in this study were declined for this reason. However, some of the PLKDs who were declined on PE in our study may also have been deemed medically unfit if they had proceeded to that step, and some of the prospective donors in the German study may have been declined on PE if that had preceded ME.

Approximately 218 (24.27%) enlisted PLKDs dropped out before donation, of whom 19.72% dropped out before completion of the COLD evaluation. In comparison, a single-center US study reported an initial “dropout” rate of 67.5% (*n* = 1688); however, many of these dropouts related to medical disqualification (*n* = 358) or contraindications, such as body mass index >35 kg/m<sup>2</sup> (*n* = 334).<sup>55</sup> In a Brazilian study, 15.6% (*n* = 79) of PLKDs dropped out in the sense of voluntary withdrawal or failure to attend, whereas 9.88% (*n* = 50) were declined on psychosocial grounds.<sup>56</sup>



In Qatar, early dropouts are often attributed to preliminary education provided at the time of enlistment as a PLKD; those presenting with the hope of selling a kidney, for example, may be discouraged upon learning about the COLD protocol and the exclusion of commercial donation, or those with an obvious medical contraindication may withdraw after receiving information about eligibility criteria. Nevertheless, most early dropouts were PLKDs claiming a genetic relationship with recipients (Table 2). Previous research in the Gulf region has found a higher proportion of dropouts overall among unrelated or emotionally related PLKDs.<sup>53</sup> Although some commentators have highlighted concerns about the costs of living donations or lack of support from donation programs as potential factors in dropouts,<sup>57</sup> the provisions of the DDA should mitigate this risk in Qatar. Further analysis to identify factors associated with dropouts after COLD acceptance will be a priority for future research. At least some of the dropouts after acceptance by the COLD may be explained by the number of transplant candidates ( $n = 57$ ) who choose to travel overseas to obtain a transplant from an unknown source (see Figure 3). Although transplant “tourism” from Qatar has decreased substantially in response to the success of the Doha Model, some transplant candidates still choose this option.

Consistent with the recommendation of the 2023 Santander Summit on transplantation,<sup>58,59</sup> the results of this study highlight the importance of comprehensive and standardized PE of all PLKDs, not merely those deemed at higher risk as unrelated donors, noncitizen residents, or international patients.<sup>60,61</sup> Although the prevalence of risk factors such as low socioeconomic status may be higher in some populations, and attempted organ trafficking may be more common in the setting of some donor-recipient relationships, such risks may be observed in all populations and can only be reliably assessed and managed through a consistent approach to the evaluation of all PLKDs. The rigorous approach within the COLD protocol to evaluation of economic and psychological vulnerabilities and documentary evidence of claimed relationships, for example, has resulted in the identification of false relationships, intrafamilial coercion, and exploitation outside the setting of low-income work. Although some programs may rely on specific psychosocial criteria to exclude PLKDs or assess risk, such as income levels or history of psychological illness, this type of screening may be ineffective in demographically heterogeneous populations in which risks may be relative and many risk factors modifiable. The use of clear criteria and standardized tools is essential, but their application requires consideration of PLKDs as individuals in the context of their families and communities. In Qatar, for example, the gross income of a prospective donor may be less relevant in determining whether they are vulnerable to exploitation or financial harm through donation than whether they have sufficient income to support their family if they donate and whether they are eligible to access various forms of social welfare.

The results of this single-center study are not generalizable, given the unique features of the COLD protocol and the demographics of the population in Qatar. More research is also needed to assess the short- and long-term psychosocial outcomes of donating or being declined as a donor,<sup>62,63</sup> and remediable factors influencing dropouts that may result in missed opportunities for living donor transplantation.<sup>64</sup> Nevertheless, this study provides valuable insights into an

innovative living kidney donation program in a small country with a multinational, economically and culturally diverse population and the impact of a systematic PE protocol on acceptance of PLKDs. It reinforces the importance of routine, multidisciplinary, nationally standardized donor screening, which has been recently proposed in the United States.<sup>49</sup> A standardized approach is essential for all countries in the Middle East region and wherever there is cultural diversity, wide socioeconomic inequities, or a high proportion of expatriates among PLKD populations.

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