

Caregivers and Healthcare Workers' Willingness to Donate Kidney in Three Tertiary Institutions in Southern Nigeria

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ABSTRACT

Background. Kidney transplantation (KT) is now the preferred renal replacement therapy in suitable patients with end-stage renal disease but organ availability is a major limiting factor.

Aims. To evaluate the willingness of caregivers (CGs) and healthcare workers (HWs) to donate a kidney and possible motivating factors in our setting.

Methods. This cross-sectional study was done at Mother and Child Hospital, Kidney Care Centre Ondo and Babcock University Teaching Hospital, all in Southern Nigeria. Participants' willingness to donate a kidney was assessed using Likert and Visual Analogue Scales (VAS). The data were analyzed using SPSS version 20.0. Student *t* test was used to compare weighted mean scores. Multivariate analysis done; $P < .05$ was taken as significant.

Results. A total of 563 CGs and HWs took part in the study. Sixty percent of them were aware of kidney donation (KD) but only 43.7% had a favorable attitude towards it, and these were predominantly HWs (63.4% vs 33.1%, $P < .001$). A quarter of the participants were adequately willing to donate a kidney; HWs were significantly more willing than CGs (45.4% vs 15.8%, $P < .001$). On VAS, the mean willingness score of HWs was higher than that of CGs ($t = 7.13$, $P < .001$). Factors strongly influencing the willingness of CGs to donate include their educational level ($P = .028$, OR = 4.86, 95% CI: 1.19–19.91) social class ($P = .012$, OR = 6.17 95% CI: 1.5–24.8) and having a relative with kidney disease ($P = .019$; OR = 3.07 95% CI: 1.25–12.00). Willingness correlated with awareness of KD among CGs ($r = 0.534$, $P < .001$).

Conclusion. There is a low level of willingness alongside negative attitudes toward kidney donation among our participants.

KIDNEY TRANSPLANTATION (KT) is now the preferred renal replacement therapy (RRT) in suitable patients with end-stage renal disease (ESRD) due to improved graft survival and procedural safety [1]. Altogether, KT is more cost effective than dialysis and it improves both the quality and quantity of life of recipients [1,2]. Therefore, there is a need for prompt access to this novel therapy in all regions, considering the rising burden of ESRD globally [1,3]. This is pertinent in resource-limited settings where patients often cannot sustain the high cost of dialysis [4]. In addition, preemptive KT is sometimes indicated [5], and some children with Wilms

tumor can benefit from KT after a 2-year disease-free interval if donor organs are available [6].

In regions with well-established transplantation programs, organ availability is a major limiting factor [7,8]. Often, this leads to increased waiting time before KT and the need to expand the potential donor pool [7–10]. Hence, there is an increasing demand for living donors. Living related and

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unrelated kidney donors are now providing organs in proportions comparable to deceased donors, with favorable outcomes [11]. Other approaches to improve organ availability include desensitization of previously sensitized recipients and living-donor exchange systems [12,13]. Rarely, anonymous (Good Samaritan) donors are available. Despite all the listed options, there is still significant waiting time, sometimes undermining KT outcome [8,14].

In developing countries, transplantation programs are associated with numerous challenges, including organ availability [15]. In a recent 10-year review of KT programs in Nigeria, Arogundade identified shortage of donor organs as well as poverty and poor legislative support as major constraints [16]. Willingness to donate a kidney differs with levels of awareness and sociocultural values of various societies [15,17]. This article sets out to evaluate participants' willingness to donate kidney and highlight the likely motivating factors, in view of the proposed commencement of a KT program in our states.

OBJECTIVES

The objectives of this study were to (1) assess the willingness of patients' relatives to donate kidneys in the setting; (2) assess the willingness of healthcare workers to donate kidneys in the future; and (3) evaluate possible predictors of participants' willingness to donate kidneys.

METHODS

Study Setting and Participants

The study was carried out at the Mother and Child Hospital (MCH) in Ondo; the Kidney Care Centre (KCC) in Ondo; and the Babcock University Teaching Hospital (BUTH) in Ilishan-Remo, all in Southern Nigeria. MCH is a busy, 100-bed, ultra-modern public facility providing specialized healthcare services. KCC is a world-class kidney hospital located at the Medical Village in Ondo. BUTH is a 200-bed ultra-modern private tertiary hospital providing specialized healthcare.

This cross-sectional descriptive study took place between July and September 2015. A simple random technique was adopted in selecting the participants who were healthcare workers (e.g. dieticians, doctors, laboratory scientists, nurses) and patients' relatives aged 18 to 60 years seen at the centers during the study period.

The minimum sample size was determined by assuming a prevalence of 50% for willingness to donate a kidney at the setting, a 95% confidence interval and a sample error of 5% [15]. This was adjusted for a 15% nonresponse rate. A total of 563 people were recruited from the participating institutions by proportionate allocation based on their respective patient loads at a ratio 2:1:1 for MCH, KCC, and BUTH, respectively. The caregiver-to-staff recruitment ratio was 2:1 at all sites.

Data Collection

The researchers and 3 trained research assistants conducted face-to-face interviews with participants using a self-designed pretested questionnaire. Pretesting of the primary survey form was done at the State Specialist Hospital in Ondo. The definitive questionnaire comprised 3 sections: participants' sociodemographic features/prior donation experience, awareness/attitudinal Likert scales, and a

100-mm visual analogue scale (VAS) on willingness to donate a kidney [18]. The Likert scales were answered on a 5-point scale from "strongly agree" to "strongly disagree." An attitudinal subscale elicited yes-or-no responses to the following 3 items: "It would be too risky to my health to donate a kidney"; "It would be wrong in my religious beliefs to donate a kidney"; and "It would be wrong in my cultural beliefs to donate a kidney." The reliability ratings (Cronbach's Alpha) of the awareness and attitudinal scales were 0.81 and 0.68, respectively.

The skills of the research assistants were verified to be adequate through role play and simulations. The interviews were conducted in English or Yoruba languages to ensure good comprehension.

Data Analysis

The data were analyzed using SPSS version 20.0 statistical software for Windows (IBM, Armonk, N.Y., United States). Adequate

Table 1. Baseline Characteristics of Participants*

Characteristics	Caregivers	Health Worker	χ^2	P Value
Age group				
<40 yrs	304 (86.4)	104 (80.0)	2.958	.085
40–60 yrs	48 (13.6)	26 (20.0)		
Sex				
Male	81 (24.9)	43 (31.6)	2.185	.139
Female	244 (75.1)	93 (68.4)		
Tribe				
Yoruba	290 (82.9)	124 (87.3)	6.024	.093
Ibo	50 (14.3)	13 (9.2)		
Hausa	5 (1.4)	0 (0.0)		
Others	5 (1.4)	5 (3.5)		
Religion				
Christianity	270 (77.1)	135 (94.4)	23.024	<.001 [†]
Islam	77 (22.0)	8 (5.6)		
Tradition	3 (0.9)	0 (0.0)		
Denomination				
Pentecostal	151 (53.0)	90 (68.7)	34.823	<.001 [†]
Catholic	69 (24.2)	9 (6.9)		
Anglican	45 (15.8)	12 (9.2)		
Jehovah witness	7 (2.5)	1 (0.8)		
Marital status				
Single	69 (19.4)	46 (31.7)	9.217	.01 [†]
Married	276 (77.7)	94 (64.8)		
Others	10 (2.8)	5 (3.4)		
Educational level				
None	10 (2.9)	1 (0.7)	53.837	<.001 [†]
Primary	22 (6.4)	3 (2.1)		
Secondary	131 (38.3)	15 (10.6)		
Tertiary	179 (52.3)	123 (86.6)		
Ever donated blood				
Yes	63 (17.6)	48 (33.8)	15.331	<.001 [†]
No	294 (82.4)	94 (66.2)		
Ever donated tissue or organ				
Yes	10 (2.8)	2 (1.4)	0.85	.523
No	348 (97.2)	141 (98.6)		
Side effect from previous donation				
Yes	13 (4.1)	8 (6.5)	17.449	<.001 [†]
No	92 (29.1)	60 (48.4)		
Not applicable	211 (66.8)	56 (45.2)		

*Non-response excluded from each variable.

[†]Significant difference.

awareness and favorable attitude were defined with a cut-off point ≥ 3.0 on Likert-scales and willingness as ≥ 50 mm on VAS.

Fisher's Exact test or χ^2 was used to compare categorized data, whereas the Student *t* test was used to determine any significant difference between weighted mean scores. Multiple logistic regression analysis was done to identify factors predicting willingness to donate a kidney. The level of significance of each test was set at $P < .05$. Pearson's correlation test was done for the association between awareness and willingness to donate a kidney on VAS.

Ethical Consideration

Ethical clearance was obtained from the Ethics and Research Committees of the Mother and Child Hospital in Akure. Written informed consent was obtained from each participant. All questionnaires were coded (without names) and confidentiality of responses was ensured throughout the study.

RESULTS

Baseline Characteristics of Participants

A total of 563 participants comprising 390 (69.3%) caregivers (CG) and 173 (30.7%) healthcare workers (HWs) took part in the study. The male-female ratio was 1:2.7. They were predominantly Christians (71.9%), married (65.7%), with a tertiary level of education (53.6%) and of Yoruba ethnicity (73.5%).

As shown on Table 1, CGs and HWs were similar in age, gender and tribal distributions. However, they differed significantly in their marital status ($P = .01$), as well as religious affiliations ($P < .001$). Compared to CG, more HWs had donated blood (33.8% vs 17.6%, $P < .001$) and perceived more side effects (6.5% vs 4.1%, $P < .001$); other prior tissue or organ donation experiences were similar among the participants.

Participants' Awareness and Attitudinal Scores

Altogether, there was a high level of awareness (60.8%) of kidney donation among the participants; HWs were significantly more aware than CGs (95.2% vs 44.8%, $P < .001$). Table 2 shows the mean scores of participants per scale. The total mean awareness score (MAS₁) of the participants was

fairly adequate (3.03 ± 1.19). MAS₁ was significantly higher for HWs than for CGs (4.01 ± 0.68 vs 2.63 ± 1.13 ; $t = 13.72$, $P = .000$).

However, only 43.7% of participants had a favorable attitude towards kidney donation, and these were predominantly HWs (63.4% vs 33.1%, $P < .001$). The total mean attitudinal score (MAS₂) was inadequate (2.78 ± 0.83). Donation to family members was preferred by participants. Although HWs scored higher than CGs (3.10 ± 0.76 vs 2.66 ± 0.76 ; $t = 5.64$, $P < .001$), the former perceived more health risk and religious/cultural disapproval than the latter on the attitudinal subscale ($P < .001$).

Prevalence of Willingness to Donate Kidney

Only 25.6% of participants were willing to donate a kidney; HWs were significantly more willing than CGs (45.4% vs 15.8%, $P < .001$). On VAS, the overall mean level of willingness to donate was low among participants, 26.26 ± 33.16 mm. HWs mean score was higher than CGs (43.55 ± 37.40 mm vs 19.33 ± 28.56 mm; $t = 7.13$, $P < .001$).

Although nearly half of the CGs were aware of kidney donation prior to this survey only one quarter of them heard from healthcare professionals. A majority of the CGs (83.7%) desire promotion of kidney donation in the community.

Predictors of Willingness to Donate Kidney

On multivariate analysis, factors significantly influencing willingness of CGs to donate include awareness of kidney donation ($P = .005$, OR = 0.2, 95% CI: 0.07-0.62), educational level ($P = .028$, OR = 4.9, 95% CI: 1.2-19.9), social class ($P = .012$, OR = 6.17 95% CI: 1.5-24.8), and having a relative with kidney disease. ($P = .019$, OR = 3.07 95% CI: 1.25-12.00). However, only the health status of the recipient significantly predicts the willingness of HWs to donate a kidney ($P = .013$, OR = 9.36 95% CI: 1.61-54.43), Table 3.

In addition, significantly larger proportions of HWs than CGs identified close family relationship to recipient (83.3%

Table 2. Mean Scores of Participants Per Scale

Scales	Total		Caregiver		Health Worker	
	Mean	SD	Mean	SD	Mean	SD
Awareness						
A living person can donate a kidney to a patient	3.65	1.56	4.75	0.72	3.20	1.58
A dead person can donate a kidney to a patient	2.46	1.37	3.31	1.53	2.13	1.14
A living person can survive well on only one good kidney	3.44	1.48	4.64	0.82	2.95	1.41
Adults can donate kidneys to children	2.55	1.84	3.31	1.22	2.25	1.96
Grand MAS ₁ [*]	3.03	1.19	4.01	0.68	2.63	1.13
Attitudinal						
I could donate one of my kidneys to a relative	3.10	1.45	3.65	1.25	2.88	1.46
I could donate one of my kidneys to a non-relative	2.27	1.33	2.94	1.35	2.00	1.22
Government should freely provide kidneys to all recipients	2.98	1.40	2.70	1.25	3.08	1.44
Grand MAS ₂ [†]	2.78	0.83	3.10	0.90	2.66	0.76

Abbreviations: MAS₁, Mean Awareness Score; MAS₂, Mean Attitudinal Score.

^{*}t test = 13.72; $P < .001$.

[†]t test = 5.64; $P < .001$.

Table 3. Predictors of Adequate Willingness to Donate Kidney Using VAS Rating (≥ 50 mm)

Variables	Caregivers			Healthcare Workers		
	P	OR	95% CI	P	OR	95% CI
Age group						
<40 y	.377	1.73	0.51–5.88	.802	1.19	0.30–4.75
40 y and above		1.00			1.00	
Awareness						
Not aware	.005*	0.21	0.07–0.62	.697	0.31	0.01–12.58
Aware		1.00			1.00	
Gender						
M	.480	1.41	0.54–3.66	.840	0.87	0.22–3.42
F		1.00			1.00	
Ever donated blood						
Yes	.092	2.36	0.87–6.41	.226	2.53	0.56–11.42
No		1.00			1.00	
Kidney disease relative [†]						
Yes	.019*	3.87	1.25–12.00	-	-	-
No		1.00			-	-
Education						
Below tertiary	.028*	4.86	1.19–19.91	.200	3.11	0.5–17.64
Tertiary		1.00			1.00	
Social class						
High	.012*	6.06	1.48–24.78	.428	0.42	0.05–3.65
Middle/Low		1.00			1.00	
Religion						
Christianity	.483	1.45	0.52–4.07	.307	0.30	0.03–2.99
Others		1.00			1.00	
Family relationship						
Yes	.434	1.56	0.51–4.77	.994	1.01	0.17–5.84
No		1.00			1.00	
Approval in religion						
Yes	.762	1.18	0.40–3.53	.387	0.52	0.12–2.29
No		1.00			1.00	
Incentive						
Yes	.175	2.08	0.72–5.97	.514	1.75	0.33–9.31
No		1.00			1.00	
Tax exemption						
Yes	.731	1.22	0.40–3.73	.778	1.26	0.25–6.29
No		1.00			1.00	
Health status recipient						
Yes	.105	2.34	0.84–6.54	.013*	9.36	1.61–54.43
No		1.00			1.00	

*Significant difference.

[†]Healthcare workers' odd ratio for this variable not computed (too few responses).

vs 21.3, $P < .001$), religious approval of organ donation (28.4% vs 19.9%, $P = .004$), and tax exemption for donors (72.5% vs 30.4%, $P < .001$) as motivators to donate a kidney.

Correlation of Willingness to Donate Kidney With Awareness

There is a strong positive correlation of willingness to donate kidney among CGs ($r = 0.534$, $P < .001$). This is shown in Fig 1A below. Factors associated with increased awareness of kidney donation among CGs include male gender ($P = .03$, OR = 2.1, 95% CI: 1.1–4.0), secondary level of education ($P = .04$, OR = 0.4, 95% CI: 0.2–0.9), and having a relative with kidney disease ($P = .004$, OR = 3.8, 95% CI: 1.5–9.3), Fig 1B.

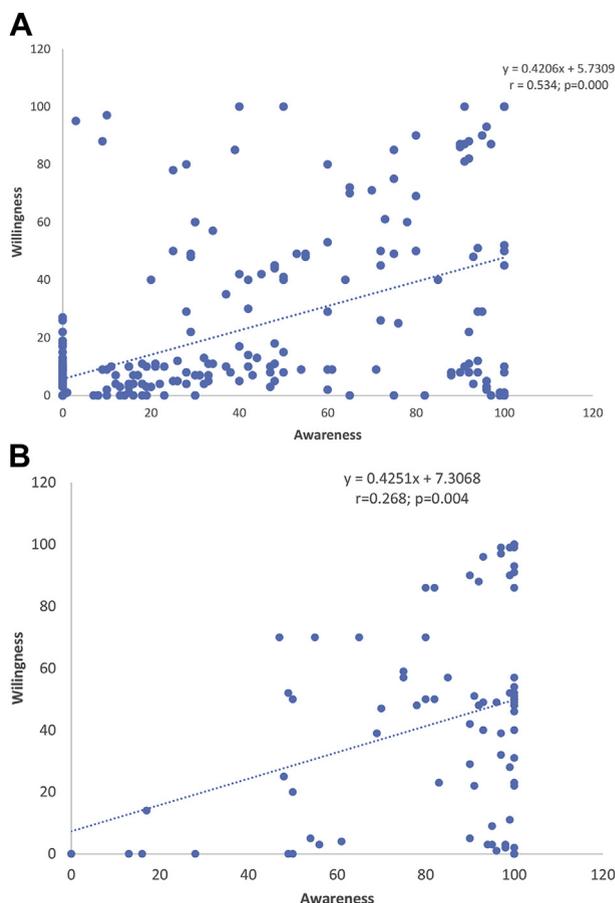


Fig 1. (A) Correlation of willingness to donate kidney with awareness among caregivers. **(B)** Correlation of willingness to donate kidney with awareness among healthcare workers.

Also, there is a significant relationship between willingness and awareness among HWs but to a lesser degree ($r = 0.268$, $P = .004$; Fig 1B).

DISCUSSION

This study confirms that about a quarter of our participants were willing to donate a kidney, comparable to the 30% found by Odusanya et al [19] in Lagos in 2006 but lower than the 75.6% reported by Agaba et al [20] in Jos, northern Nigeria among health professionals. The higher level of willingness in the northern study is apparently due to the different cultural environment as well as the predominant use of close-ended questions in the survey rather than VAS, which has enhanced reliability in assessing continuous attitudinal variables [18]. The HWs participating in our study expressed a higher level of willingness (45.4%) than the CG, perhaps due to their better understanding of the benefits of KT to recipients. Similarly, Zhang et al, in a survey in three universities in China, found that 49.8% of their respondents were willing to donate a kidney [21]. In contrast, Saleem et al [15] found that 62% of their participants were willing

to donate a kidney in Pakistan and Sander et al [22] reported 96% willing to donate in Ohio. These higher proportions of willing donors may be related to the prevalent poverty-related organ vending in the former and well-legislated KT programs in the latter study [15,22]. Nonetheless, variations in cultural and religious views among regions often interfere with acceptance of proven scientific therapies, including KT [16,17].

Furthermore, the prevalent attitude toward kidney donation was unfavorable in this survey even among HWs, who were much more concerned about health risk and religious approval than the CGs. This may partly reflect diverse faith-based healing beliefs among the significantly different religious denominations of the participants. Several studies have identified “presumed forbiddance in religion” as a common reason for organ donation refusal [15,23]. A majority of our participants desired promotion of organ donation in the community, consistent with prior reports [24,25]. Hence, there is a need to provide relevant health information to the populace in our region [26]. This will correct the possible misperception of altruistic kidney donation as organ trafficking for monetary gain. The promising attitude of our participants towards donation to a close relative may reflect the donor’s affection and perceived obligation towards the recipient, as reported in previous studies [24,27].

Moreover, there is a significant relationship between our participants’ willingness and knowledge of kidney donation consistent with prior reports [25,26]. Modifiable factors, such as having a secondary level of education and high social class, are associated with increased awareness and willingness to donate in this study. Thus, increasing the level of literacy in the setting could translate to an improved kidney donor pool. Randhawa et al [25] and Callender et al [26] showed that appropriate health education significantly increased the rate of actual donation among their study participants. Regrettably, recent research in Baltimore, Md., confirmed that more than 68% of kidney failure patients themselves knew little about transplant benefits [28]. Hence, there is a need to further educate patients and caregivers on this novel therapy, especially in medically-underserved regions.

Other predictors of willingness to donate include prior blood donation. Integration of kidney donation promotion into successful tissue donation programs such as the National Blood Transfusion scheme should be considered. This may be more efficient than running parallel programs [29]. Marital status did not significantly influence willingness to donate a kidney in this study, consistent with the Pakistani survey [15]. Also, we did not find any significant association between participants’ willingness and their age groups, unlike the Lagos study in which younger age predicted willingness [19]. Although males were more aware of kidney donation than females in this survey, there is no gender difference in their levels of willingness, similar to earlier reports [15,19].

In conclusion, a majority of our participants were unwilling to donate a kidney. There is a need to improve legislative support of organ donation and orient

communities via appropriate health education packages for a sustainable KT program in our setting.

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