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QUALITY OF LIFE FOR KIDNEY DONORS AFTER DONATION AT A NATIONAL TEACHING AND REFERRAL HOSPITAL IN KENYA

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Abstract

Introduction: Kidney transplantation is the best renal replacement therapy for patients with end stage kidney disease. Living kidney donor transplant has better graft and recipient outcome. Information regarding quality of life of kidney donors has a positive influence on a potential donor's attitude towards kidney donation. The aim of the study was to examine kidney donors' quality of life in Kenya.

Methods: This was a cross-sectional descriptive study design that aimed at examining the quality of life of kidney donors' after donation at a national teaching and referral hospital in Kenya. A total of 99 donors participated in the study. Descriptive and inferential statistical tests were used to analyze data. Predictors of quality of life were determined using multiple regression models.

Findings: Majority of the respondents had high quality of life. There was a strong significant relationship between donor's Body Mass Index and Health Functioning component of QoL r (0.835), p<0.05 with a moderate relationship in Psychological factors r (0.492), p $>$ 05. Also there was a statistically significant association between, current monthly income, $x^2(1, n = 99)$ =24.793, (p $<$0.05), marital status $x^2(1, n - 99)$ =10.261 (p$<$0.05) and employment status $x^2(1, n = 99)$ =11.474 (p $<$0.05) and quality of life of kidney donors. Multiple regression analysis revealed that Health functioning quality of life component explained 27.5% of the total variance of quality of life while psychological factors explained 12.5%.

Conclusions: The overall quality of life of kidney donors was high. Kidney donor's employment status had a significant predictive association with their quality of life.

Keywords: *Kidney transplantation, Kidney donors, quality of life*

Introduction

Chronic Kidney Disease (CKD) has had a consistent rise in the recent years with an estimated global prevalence rate of between 11 to 13% (Anothaisintawee et al., 2009). CKD stage 5 is also reported as an important contributor of morbidity and mortality among patients with non-communicable diseases in Sub-Saharan Africa (Naicker & Ashuntantang, 2017; Abd Elhafeez et al., 2018). Studies reported an estimated prevalence of CKD in Kenya by 2018 at 10%, in-keeping with the prevalence reported in other parts of the world (Cherono, 2018). Patients with CKD stage five, referred to as end stage kidney disease (ESKD) will require a renal replacement therapy**.** The renal replacement therapy can be in form of dialysis (peritoneal or hemo-dialysis) or kidney transplantation. Kidney transplantation has been shown to be the

best renal replacement therapy for restoring quality of life (QoL) to patients with ESKD. Kidney donation can either be from living or deceased kidney donors.

Living donor kidney transplants (LDKT) are reported to have a longer graft and patient survival compared to deceased donor grafts (Bugeja & Clark, 2017; Sawinski & Locke, 2018). The living donor grafts are also reported to have better overall patient outcomes (Martínez et al., 2018). Studies have also indicated that Living kidney donation is the main source of organs for patients with ESKD requiring kidney transplantation in Sub-Saharan Africa(Naicker & Ashuntantang, 2017). Information regarding donors' QoL following donation is of key importance to potential donors and helps to increase positive attitude towards kidney donation (Gordon et al., 2015).

The World Health Organization (WHO) defines Quality of life (QoL) as an individual's perception of their own position in relation to their goal expectations. QoL defines ones' economic independence, guarantee for employment, career planning development and social relationships (Ruzevicius, 2016). Studies indicate that living kidney donors can still live a normal life after kidney donation(Messersmith et al., 2014; Sommerer et al., 2015; Klop et al., 2018). Living kidney donors have reported the donation experience as satisfying (Nöhre et al., 2018). Other studies done reported that living donor transplantation procedure is safe and that kidney functions of the donors after nephrectomy were normal (Ochwila, 2014; Muturi et al., 2017). However documented data on QoL after kidney donation in Kenya is scarce. Guidelines on follow-up of kidney donors after donor nephrectomy in Kenya are still not available.

The objective of this study was to determine the quality of life (QoL) of living kidney donors in a teaching and referral hospital in Kenya. The study sought to determine the socio-demographic characteristics and economic factors that impacted on QoL of kidney donors in the study population. The study results will help inform practice especially in Kidney tranplant donor and recipient selection counseling. The results will also help, formulate policy and inform future researches.

Methods

A cross-sectional descriptive research design was adopted targetting a population of 143 people who participated in kidney donation between January 2010 and December, 2017. The aim was to determine the QoL of the living kidney donors who had lived at least one and half years after kidney donation. A convenience sampling method was used to achieve sample size of 99 (94%) respondents. The donors were recruited through contacts from donor records in the renal unit and through the recipients who already had a regular follow-up in the transplant clinic. Data was collected through a self-administered questionnaire for those who were able to read and write. The researcher used an interviewer administered questionnaire to collect data from those who could not read and write. The questionnaire

had three sections, Section I, socio-demographic data, Section II, socio-economic factors, Section III (a), QoL psychological component and Section III (b), QoL health functioning component.

Data was analysed using Statistical Package for Social Sciences (SPSS version 25.0). Descriptive statistics, frequencies, percentages, means and standard deviations were used to analyse socio-demographic characteristics, age, gender, number of children, highest level of children, marital status and BMI. Inferential statistics, Pearson correlation and chi square analysis tests were used to give meaning to the data.

A multiple regression analysis was applied to determine the predictors of QoL of kidney donors. Ethical approval for study was obtained from the Kenyatta university ethics review committee and the hospital research and ethics committee. A permit to collect data was given by the National Commission for Science, Technology and Innovation.

Findings

Characteristics of the respondents

A total of 99 (94%) kidney donors participated in this study, majority of them, 54.5%, (n=54) were male. The mean age of the donors was M: 38.65 SD:9.04, majority, (84.9%) had attained at least a secondary level of education and 79.8%(n=79) were married.

Table 1: Characteristics of the Respondents and QoL measures

Attributes	Categories	Mean	SD	N (%)
Age (years)	Age at donation	33.22	8.48	
	Age at Survey	38.65	9.04	
Gender	Male			54(54.5)
	Female			45(45.5)
				At survey
Highest level of education	University level			13(13.1%)
	College level			42(42.4%)
	Secondary level			29(29.3%)
	Primary level			15(15.2%)
Marital Status	Married			79(79.8%)
	Single			19(19.2%)
BMI at enrolment to study (kg/m^2)		25.52	4.58	
Employment status	Businessman			39(39.4%)
	Working full time			43(43.4%)
	Working part time			6(6.1%)
	Unemployed			11(11.1%)
Monthly income (Ksh)	Less than 5000			17(17.2%)
	5001 to 20000			32(32.3%)
	20001 to 35000			18(18.2%)
	35001 to 50000			13(13.1%)
	Over 50000			19(19.2%)
Quality of Life Psychological component		4.284	0.971	
Health & Functioning component		3.905	0.865	

The mean Body Mass Index (BMI) of the donors was M=25.52 SD=4.58 (kg/m^2) and majority, 43.4% (n=43) were in full time employment. The study findings also revealed that, 11.1% (n=11) of the donors were not in any form of employment. From the study findings, 63.6% (n=63) of the donors earned a monthly salary between Ksh.5000 and Ksh 50,000.

The QoL measures assessed in this study were psychological factors and Health functioning. The results recorded a mean score of M: 4.284 SD: 0.971 in Psychological QoL component and M: 3.905 SD: 0.865 in Health functioning QoL component.

The results revealed that, BMI had a strong positive significant relationship with Health Functioning component of QoL r (0.835), p<0.05 and a moderate positive relationship with Psychological factors r (0.492), p >05. However, the study findings indicated that there was no significant association between age, number of children and quality of life components as shown in table 2. There was a statistically significant association between marital status after kidney donation and Health functioning QoL component, $x^2(1, n = 99)$ =10.261 with a =0.006 (p <0.05).

The donors who were married, recorded a higher QoL score (92%) compared to those who were single (90%). However, no significant association was found between the respondents' gender, level of education and QoL as shown in table 3.

The study findings did not report any differences in QoL scores between male and female donors.

Table 2: Relationship between age, number of children, BMI and QoL components

Attributes	Age	Number of children	BMI	Psychological factors	Health and Functioning
Age	**1**	.668**	.174	-.847	0.194
		.000	.085	.020	.064
Number of children		**1**	.887	-.634	.219
			.019	.018	0.90
BMI			**1**	.492	.835
				.07	.021
Psychological Factors				**1**	0.399
					0.307
Health and functioning					**1**

***. Correlation is significant at the 0.01 level (2-tailed).*

Table 3: Relationship between Gender, Highest level of education, Marital status and QoL (Psychological component and Health functioning)

Attributes		Total	Low	High	Statistical Test
Gender	Male	54	5	49	$x^2(1, n = 99)$ =0.04 p=0.615 (p >0.05)
	Female	45	4	41	
Total		99	9	90	
Highest level of education	University level	13	3	10	$x^2(1, n = 99)$ =3.545 p=0.315 (p >0.05)
	College level	42	3	39	
	Secondary level	29	2	27	
	Primary level	15	1	14	
Total		99	9	90	
Marital status	Married	79	6	73	$x^2(1, n = 99)$ =10.261 p=0.006 (p <0.05)
	Single	19	2	17	
	Separated	1	1	0	
Total		99	9	90	

Relationship Between, Current monthly income, Current employment and QoL (Psychological Component and Health functioning)

The study findings revealed a statistically significant association between current monthly income and QoL of kidney donors both in psychological $x^2(1, n = 99)$=24.793 p=0.000 (p < 0.05) and health functioning $x^2(1, n = 99)$ 10.512 p=0.033 (p <0.05) as shown in table 4. The findings also recorded significant association both in current monthly income $x^2(1, n = 99)$ =10.261 (p <0.05), and current employment $x^2(1, n = 99)$ =11.474 p <0.05), in Health functioning QoL component.

Donors on full time employment (93%) had a higher QoL score compared with those who earned their living through business. Current employment had a higher association with health functioning QoL than current monthly income. The findings also indicated that 63.6% of the donors who were not in any employment recorded high QoL score both in Psychological and Health functioning. Findings are as shown in table 4.

Predictors of Quality of Life of Kidney Donors

A multiple regression analysis revealed that, Marital status after kidney donation, had a strong positive predictive relationship, β =1.085, t= 0.836 (psychological factors), with a moderate positive predictive relationship, β =0.625, t= 0.234 (Health Functioning), however the relationships were not statistically significant.

Current employment (β =0.350, t= 3.978, p=0.000) had a significant positive predictive relationship with psychological component of QoL. The psychological factors contributed to 12.5%, while Health functioning contributed 27.5% to the QoL of the kidney donors in this study as shown in table 5.

Table 4: Association between, Current Monthly Income, Current employment and QoL

Psychological factors Attributes		(N)	Low	High	Statistical test
Current employment	Businessman	39	8	31	$x^2(1, n = 99) = 6.537$ p=0.088 (p >0.05)
	Working full time	43	3	40	
	Working part time	6	1	5	
	Unemployed	11	4	7	
Total		99	16	83	
Current monthly income (Ksh)	Less than 5000	17	9	8	$x^2(1, n = 99) = 24.793$ p=0.000 (p <0.05)
	5001 to 20000	32	6	26	
	20001 to 35000	18	1	17	
	35001 to 50000	13	0	13	
	Over 50000	19	0	19	
Total		99	16	83	
Health Functioning					
Current Monthly income (Ksh)	Less 5000	17	5	12	$x^2(1, n = 99) = 10.512$ p=0.033 (p <0.05)
	5001 to 20,000	32	1	31	
	20001 to 35,000	18	1	17	
	35001 to 50,000	13	1	12	
	Over 50,000	19	1	18	
Total		99	9	90	
Current employment	Businessman	39	2	37	$x^2(1, n = 99) = 11.474$ p=0.009 (p <0.05)
	Working full time	42	3	40	
	Working part time	6	0	6	
	Unemployed	11	4	7	
Total		99	9	90	

Table 5: Multiple Regression Results

	Psychological component				Health Functioning Component			
Variable	Adjusted R^2	β	T	p value	Adjusted R^2	β	T	p value
Constant	.125	3.356	6.639	0.000	.276	1.933	11.068	.000
Marital status		1.085	0.836	0.405		0.625	0.234	0.273
BMI		.101	0.221	0.826		0.058	0.891	0.593
Current monthly income		.402	0.714	0.477		0.231	1.524	0.569
Current Employment		.350	3.978	0.000		0.201	3.138	0.291

Discussion

Majority of the respondents in this study were male, consistent with (Kabinga, 2015), meaning that in Kenya males are more likely to be kidney donors than females. These findings however were in contrast with studies done in India (Sakhuja & Kumar, 2014) and United States (Jowsey et al.,

2014) which reported more female participants. According to (Sakhuja & Kumar, 2014), the Indian community looks at men as bread winners and women usually volunteer to be kidney donors so that the men are left to work to feed the families.

The mean age of the donors in this study was 38 years, considered to be a young donor population. In Kenya young people are considered healthier and therefore expected to have a better QoL after kidney donation. According to Kabinga , 2015, majority of kidney donors in Kenya are siblings which also explains the young donor population. This is different from a study done in Norway, where they prefer using older donors (Meyer et al., 2016). They consider the graft longevity and life potential of the recipient after kidney transplantation as the reason why they discourage young to old kidney donation(Mıhçıokur et al., 2019). However in other studies, old age is assumed to have increased chances of co-morbidities and reduced natural immune responses which can compromise their QoL(Mıhçıokur et al., 2019). Regarding level of education, majority of the donors in this study had attained college level of education and above.

The findings reported that 89% of the donors who had attained college level of education and above had a high QoL score. This is consistent with other studies which reported that higher level of education enhances better understanding of the donor's role and responsibilities to lead a better QoL after kidney donation (Jowsey et al., 2014).

The study results revealed a strong positive significant relationship between BMI and Health Functioning QoL component. The study findings indicated that, most of the donors in this study-maintained a near normal BMI (18.5 to 24.9). A healthy BMI has been associated with a good QoL after kidney donation(Lee, Lee, Kim, Lim, & Park, 2017 Klop et al., 2018). According to these studies, high BMI is associated with surgical complications, increased risk to impaired physical and health related QoL. This means that an improvement in BMI towards normal will lead to improvement in kidney donors' QoL.

According to a study by Muturi et al, counselling on weight reduction pre and post kidney donation improved QoL of kidney donors (Muturi et al., 2017). There was a significant association between donors' Marital status and QoL. The findings revealed that 84.8% of those married had high quality of life score. A regression analysis revealed that, marital status after kidney donation had high positive predictive association to QoL both in Psychological and Health functioning components. This means that being in a marriage positively impacted on QoL of these donors. Companionship in marriage can enhance recovery and lead to good QoL, consistent with (Messersmith et al., 2014, Nöhre et al., 2018).

Socio-Economic factors play a major role in one's QoL since they can affect the ability to make healthy choices. Majority of the donors in this study, were on full time employment and recorded higher QoL scores, which means that they were physically and psychologically stable to take up the job challenges. Working in a stable job will help them plan their lives which can lead to psychological stability and could translate to good QoL, consistent with (Jacobs et al., 2015). This study also reports that financial stability brings about emotional and psychosocial satisfaction (Jacobs et al., 2015).

The study findings revealed that, Health functioning QoL component had a higher contribution towards quality of life of kidney donors compared to psychological factors**.** There was a significant predictive positive association between Current Employment and Psychological component of QoL. Current employment is accompanied with psychological stability, implying that being in employment is a significant predictor of good QoL of kidney donors. Employment will assure constant income, which will enable the donors to plan their lives thus contributing to good quality of life. Being able to satisfy financial needs will make the donor psychologically satisfied and will lead to a good quality of life.

Conclusion

Socio-demographic and economic factors particularly, BMI, current marital status, current employment and current monthly income have a significant contribution towards QoL of kidney donors. Current employment has a significant predictive association with QoL of kidney donors in Kenya. The donor's financial stability contributes to their quality of life meaning that, an increase in monthly income will result to improvement in kidney donor's QoL. Age, gender and level of education have no significant association with QoL of kidney donors in Kenya.

Key points

1. Kidney donors can still live a normal life after kidney donation

2. There's no association between, age, gender, level of education and QoL of kidney donors.

3. The kidney donor's employment status has a significant influence on their QoL.

4.There's need to develop a health education tool which will be used by both potential and living kidney donors to encourage positive living to improve their quality of life.

Recommendation

There is need to develop a risk assessment tool to be used when counselling potential donors to enhance quality of life. The study recommend the need to develop a health education tool which will be used by both potential and living kidney donors to encourage positive living which will improve their quality of life. It is also recommended that transplant centers provide communication forums where donors can interact with each other, those aspiring to be donors and use the forum to give educational materials and to link to other donors globally.

Relevance to Nursing and Midwifery

Nurses play a significant role in donor-recipient selection and recruitment for kidney transplantation. The transplant programs are run by nurses who play role of transplant counseling and co-ordination. Information regarding safety of transplant procedure and donors' QoL following donation will empower the transplant counselors with knowledge to help potential donors increase positive attitude towards kidney donation. Knowledge on QoL of existing donors will be useful in promoting kidney donation and help change practice. The results of this study will help in formulation of policies that will inform practice. The recommendations of this study can also inform future researches.

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