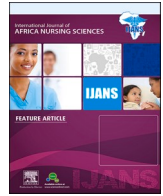


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Knowledge, attitude and barriers to kidney donation in Limpopo province, South Africa

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ABSTRACT

Background: The mortality rates of clients on the transplant waiting list for kidney donations, raised concerns. Members of their families could have saved their lives by donating one of their kidneys. A need was therefore identified to explore and describe the study participants' knowledge with regard to kidney donation.

Aim: The purpose of this article was to explore the knowledge of clients at a health care facility, as regard to kidney donation.

Method: A quantitative, explorative, cross-sectional design was used. Simple random sampling was used. The data analysis was done using the Statistical Package for Social Sciences (SPSS) computer software version 25. The respondents were all clients visiting outpatient department at an urban health care facility in Limpopo province, South Africa. Data were collected using a structured pre-tested questionnaire. Of the 317 questionnaires distributed face-to-face, 300 were deemed valid and considered for the study.

Results: The study revealed inadequate knowledge and understanding of renal donation among clients at an urban health care facility in Limpopo province. Barriers that prevented the respondents from volunteering to donate a kidney were diseases such as diabetes and hypertension, their cultural beliefs and an HIV-positive status. The study found that the respondents believed kidney donation might change their bodies post-transplant, and were thus unwilling to donate.

Conclusion: The respondents' knowledge of kidney donation was inadequate. Their religion was not against kidney donation however, they preferred to die with their intact body parts. The most barrier against kidney donation was cultural beliefs. The results will be presented to the Limpopo Department of Health in South Africa, with a view to promoting effective measures aimed at educating people regarding the importance of kidney donation.

1. Introduction

Chronic renal failure is related to a decrease in the kidneys' filtration rate, coupled with the loss of regulatory, endocrine and excretory functions (Lewis, Dirksen, Heitkemper, Butcher, 2014). The treatment for chronic renal insufficiency includes peritoneal dialysis and haemodialysis, while a patient awaits a renal transplant from either a living donor or a cadaver (Silva et al. 2016). Peritoneal dialysis is defined as the introduction of sterile dialysing fluid through an implanted catheter into the peritoneal cavity, while haemodialysis involves the separation and removal of excess electrolytes, fluids and toxins from the blood by means of a haemodialyser, which acts as an artificial kidney (Urden, Stacy & Lough, 2011). Haemodialysis entails filtering a patient's blood through a machine, with the aim of removing urea from the body.

The shortage of donated organs has become a public health crisis, as increased demand continues to surpass supply (Manojan, Raja, Nelson, Beevi & Jose, 2014). Irrespective of the treatment options available for patients with kidney failure, the burden of chronic diseases (such as chronic renal failure) is high and ever increasing (Thomson & McKeown, 2012).

Statistics pertaining to 2017 were obtained from the records division of an urban health care facility located in Limpopo, a province of South Africa. The data revealed that there is currently one dialysis centre serving 200 clients, of whom 100 are on peritoneal dialysis and 100 on haemodialysis. Several newly diagnosed clients of the facility have not yet joined the haemodialysis programme. In 2016, only four transplants took place at the facility, and seven of its clients died while on the transplant waiting list. In 2017, six clients died, and no transplants were

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done (Register of the researched urban health care facility, 2017).

More people are being diagnosed with end-stage disease in organs such as the heart, liver and kidneys, while the supply of these organs is decreasing worldwide (Fabian & Crymble, 2017). In South Africa, the numbers of organ-awaiting patients are steadily increasing, judging from the thousands of names on national transplant lists. The national transplant service, which coordinates the South African Renal Registry data, has admitted that efforts to increase the donation rate have been unsuccessful, with the kidney transplant rate at only 4.1 per million of the population in 2014 (Fabian & Crymble, 2017). This translates into many patients (including the newly diagnosed) having to receive prolonged interim therapy – at significant cost to the health care system while awaiting transplant (Fabian & Crymble, 2017).

According to the study by Jernigan et al. (2013) on knowledge, beliefs, and behaviours regarding organ and tissue donation in selected tribal college communities, the results confirmed that cultural beliefs influence attitudes about organ donation and transplantation. Issues related to mistrust of the local health care system were also raised. Health professionals can play a significant role in improving the general public's attitude by creating awareness among them and improving their knowledge.

In a study conducted on Egyptian medical students' knowledge and attitudes about organ donation (Hamed et al. 2016), (45%) of students rated themselves as supporting organ donation, in comparison to the (63%) of students who did not support organ donation. Fifty per cent (50%) were willing to donate to any recipient, while (42%) were selective in their desire to donate either to their family or friends. The causes of refusal to donate among those with negative attitudes were familial refusal (13%), religious prohibitions (19%), fear of commercialism (27%), fear of surgery (10%), and lack of confidence in the health care system (31%) (Hamed et al. 2016).

The South African government's health care policy, which is primarily focused on primary health care interventions as a cost-effective strategy to improve public health, should not neglect transplantation (Thomson, 2017). Although it is not prioritised as a major health care need, transplants permeate the whole health care system: a patient can only be assessed as a potential organ recipient when all treatment options have been exhausted; the family can only be approached for consent to donate when they have been adequately counselled about the clinical situation. Thus, organ donation rates can and should be used as a measurable health outcome (Thomson, 2017).

According to a study by Timmerman et al. (2015), which explored knowledge about dialysis, transplantation and living donation among patients and their living kidney donors, both the potential donors and those with end-stage renal disease need appropriate knowledge of dialysis, transplantation and living organ donation (with specific reference to the kidney), to be able to make a fully informed treatment decision.

In South-West Nigeria, Oluymbo et al. (2016a) identified attitude and a lack of knowledge among health care workers as barriers to successful organ donation, in their study on health care workers' knowledge of organ donation and willingness to donate. Their findings indicate that health care workers in Nigeria might not have sufficient knowledge to be able to advise donors, recipients and the community on renal donation.

At the Limpopo health care facility under study, the researcher observed that renal clients' relatives and the public at large were not knowledgeable about kidney donation, and this prompted the need to investigate and describe their actual knowledge of the subject. The researcher worked in the renal unit for two years, and was concerned by the mortality rate of those on the transplant list awaiting kidney donation, knowing that each family could potentially have saved the life of their loved one, by donating a kidney. The researcher's observations during interactions with clients from the health care facility, whom she encountered at malls during annual awareness campaigns on World Kidney Day, revealed a distinct lack of knowledge about kidney donation. Being uninformed might be a contributory factor in the public's

reluctance to donate.

This prompted the current study, which aims to explore and describe the renal donation-related knowledge of all clients who visited the outpatient department at the Limpopo province urban health care facility in South Africa. For the purposes of this article, a client is operationally defined as someone who seeks health care services. The public knowledge and understanding with regard to kidney donation was determined, the factors which prevented clients to volunteer donating kidneys was identified and the attitudes of public with regard to kidney donation was described.

The contribution of this study will be available to the Limpopo Department of Health in South Africa. The researcher envisages that this will help to put in place effective measures aimed at educating the public about renal donation, and prompt the development of policy regarding renal donation awareness programmes.

2. Material and methods

2.1. Study design

A quantitative, exploratory, descriptive cross-sectional design was employed. The setting for the study was the outpatient department of a public urban health care facility in Limpopo province, South Africa, which serves as a tertiary and referral hospital for the province as a whole.

2.2. Study population

The population comprised of clients visiting the outpatient department for check-ups. The researcher targeted clients who meet the inclusion criteria and who were willing to participate in the study. Population size was obtained from the outpatient register which consisted of 1800 clients that were seen after every two weeks in March 2018.

2.3. Sampling and sample

The sampling frame used was the register of clients who visited the outpatient department at the sampled clinic, to make use of a variety of health care services. Simple random sampling was used to select respondents from the sampling frame, where each was listed separately – everyone thus had an equal chance of being included in the sample (Brink, Van der Walt & Van Rensburg, 2018). The sample was calculated through the assistance of a statistician by using Slovin's formula. The final calculated sample consisted of 317 respondents.

$$\begin{aligned} n &= N/(1 + NE)^2 \\ &= 1800/(1 + 1800)(0.05)^2 \\ &= 317 \end{aligned}$$

However, during data collection only 300 respondents participated. The statistician was consulted and agreed on the number.

2.4. Validity and reliability of the research instrument

Prior to commencing with data collection, the validity and reliability of the questionnaire had to be ensured. It was sent to the researcher's supervisor, the aforementioned statistician and professional nurses working in the identified outpatient department and renal unit, to verify content validity. It was pre-tested before main data collection in order to ensure reliability. Ten respondents participated in pre-testing. In order to avoid duplication of the results, these respondents were not part of the main study. Furthermore, Cronbach's Alpha test was used to check reliability.

2.5. Data collection procedure

Data were collected for two successive weeks, from the 12th to the 15th of March 2018 and from the 19th to the 22nd of March 2018. Before main data collection pre-testing of an instrument was conducted from 10 respondents of the same health care facility where the main data collection was conducted. These respondents signed an informed consent form. These respondents were not part of the main study in order to avoid duplication of the results. Modification of an instrument was done after pre-testing.

The data were collected from clients of the health care facility as they waited to be seen by the doctor in the outpatient department. They were randomly selected from the out-patient register. After explanation of the purpose of the research, and being informed that anonymity and confidentiality will be maintained, an informed consent was signed voluntarily by the respondents. The pre-tested questionnaire which was written in English and comprised of 32 closed-ended questions was used.

Throughout the data collection process, the researcher was available to clarify questions, where needed. Of the 317 questionnaires distributed, ten were incomplete and subsequently not used for data analysis, and seven were not returned. In total 300 questionnaires were analysed using the SPSS computer software version 25, with the assistance of the statistician.

2.6. Data analysis

Data was analysed descriptively by using the Statistical Package for Social Sciences (SPSS) computer software version 25. Three hundred (300) questionnaires which were screened for completeness were analysed. The assistance of the statistician was used. Cronbach's Alpha tests provided a summary of inter-correlations that existed on the respondents' knowledge of renal donation. Frequency tables and mean score ranking techniques were descriptive statistics which were used. The results were presented in percentages, graphs and tables.

2.7. Ethical considerations

Data collection was conducted after an approval from the Research and Ethics committee of the department of health studies at the University of South Africa. Furthermore by obtaining written permissions to conduct the study from the Provincial Research Ethics Committee and the specific urban health care facility in Limpopo province, South Africa. In this study, no unauthorised person was allowed to gain access to data and individuals were not identified by their names. The researcher respected the rights of the participants in the study, and was sensitive to and respected the beliefs, habits, and lifestyles of respondents from different cultures. After explaining the purpose and significance of study to the respondents, the researcher assured them that confidentiality and anonymity would be maintained, and showed them completed forms to this effect. They all gave written informed consent.

3. Results

3.1. Presentation of results

Table 1 shows the results of the respondents' knowledge and understanding of renal donation. Seventy-two point three per cent (n = 217) agreed that a normal person has two kidneys, whereas 27.7% (n = 83) were not sure. This showed that – in this respect – most respondents are knowledgeable about the human anatomy.

About 18.3% (n = 55) of the respondents in this study agreed with the statement that kidneys remove waste and poisonous substances from the body, whereas 81.7% (n = 245) were not sure. Thus, the majority of the respondents did not know what function the kidneys have. Twenty per cent (n = 60) of the respondents in this study agreed that damaged kidneys could be replaced by another healthy kidney, whereas 74.7% (n

Table 1

Knowledge and understanding of kidney donation from respondents with a literacy level of grade 8 and above (N = 300).

Items	Description	Agree	Not sure	Disagree
1	A normal person has two kidneys	n = 217 (72.3%)	n = 83 (27.7%)	0
2	Kidneys remove waste and poisonous substances from our bodies	n = 55 (18.3%)	n = 245 (81.7%)	0
3	Damaged kidneys can be replaced by another healthy kidney	n = 60 (20%)	n = 224 (74.7%)	n = 16 (5.3%)
4	Renal donation is done when you are healthy	n = 45 (15%)	n = 255 (85%)	0
5	Renal donation is to give away one of your kidneys while you are alive	n = 24 (8%)	n = 276 (92%)	0
6	A friend, relative, parents or anybody can donate a kidney	n = 36 (12%)	n = 264 (88%)	0
7	A person can survive with one kidney if the other one is damaged or absent	n = 44 (14.7%)	n = 236 (78.7%)	n = 20 (6.7%)
8	A person can donate to anyone, even if they are not family	n = 33 (11%)	n = 247 (82.3%)	n = 20 (6.7%)
9	Your family can sign for your kidneys to be donated after death	n = 10 (3.3%)	n = 105 (35%)	n = 185 (61.7%)
10	A person can be kept on dialysis while waiting for renal donation	n = 14 (4.7%)	n = 286 (95.3%)	0

= 224) were not sure and 5.3% (n = 16) disagreed. The majority's uncertainty is indicative of the public's inadequate knowledge of renal donation.

Fifteen per cent (n = 45) of the respondents agreed that renal donation is done by healthy donors, while 85% (n = 255) were not sure. The majority of the respondents were thus not clear on when renal donation should occur. It is important for potential living donors to undergo proper medical, surgical and psychological screening before they donate. A study conducted in the United States, by [Sawinski & Locke \(2017\)](#) on the evaluation of kidney donors, concurs: living kidney donors need to be healthy, and free of isolated medical abnormalities at the time of donation.

Only eight per cent (n = 24) of the respondents agreed that renal donation involved giving away a kidney while the donor was still alive, and an overwhelming number 92% (n = 276) were not sure. Thus, the vast majority of respondents were not aware that one kidney can be removed for donation while the donor is still alive. A donor can live with only one kidney, as long as she/he was thoroughly evaluated and cleared for donation. Eleven per cent (n = 33) of the respondents agreed that a person could donate to anyone, even outside of the family. Eighty-two point three per cent (n = 247) were not sure, and 6.7% (n = 20) disagreed. Medically speaking, a donor and recipient have to be compatible, not necessarily blood related.

Table 1 shows that just over 3.3% (n = 10) of the respondents agreed that family could sign for a donor to donate after his/her death, 35% (n = 105) were not sure, and 61.7% (n = 185) disagreed. With reference to South African legislation on consenting to donate organs for transplantation, unless otherwise stated by the deceased prior to death, in a formal witnessed statement or written declaration, consent for organ donation may be provided by the "spouse, partner, parent, guardian, major child, major brother or major sister" ([Government of the Republic of South Africa, 2004](#)).

As indicated in table 1, just more than 4.7% (n = 14) of the respondents agreed that a patient could be kept on dialysis while waiting for a renal transplant, while 95.3% (n = 286) were not sure. Arguably, the overwhelming majority of respondents did not know what dialysis is, as some stated that they had only heard the word for the first time during the study.

3.2. Factors preventing clients from volunteering to donate a kidney

Table 2 shows the frequency and percentages of factors which might prevent the respondents from volunteering to donate a kidney. The results revealed that 7.3% (n = 22) stated they could not donate for religious reasons, 12.7% (n = 38) were not sure, and 80% (n = 240) disagreed. This indicated that the majority felt their religion would not oppose organ donation.

Fifty-two per cent (n = 156) of the study's respondents agreed that diseases such as diabetes and hypertension could prevent a person from donating an organ, 46.7% (n = 140) were not sure, and 1.3% (n = 4) disagreed. About 61% (n = 183) of the respondents agreed that cultural beliefs might prevent someone from donating a kidney, 8.3% (n = 25) were not sure, and 30.7% (n = 92) disagreed. Therefore, the majority adhered to their culture in this respect. Eighty-six per cent (n = 258) agreed that it is scary to donate a kidney, 7.7% (n = 23) were not sure, and 6.3% (n = 19) disagreed. Thus, most respondents were unwilling to donate, for reasons related to fear. In the present study, 2% (n = 6) of the respondents agreed that obesity could make someone ineligible to donate a kidney, 93.7% (n = 281) were not sure, and 4.3% (n = 13) disagreed. The results showed that the majority of respondents did not know what disqualified someone from donating.

About 17% (n = 51) agreed that a person diagnosed with cancer cannot donate a kidney, 79.3% (n = 238) were not sure, and 3.7% (n = 13) disagreed. The majority were thus not knowledgeable about health complications related to cancer. Donors with a previous history of cancer could represent an important source of organs, given that the risk of cancer transmission may be lower than previously estimated – a finding, which is supported by Baudoux et al. (2017), who studied donor-cancer-transmission in the context of kidney transplants. Eighty-nine per cent (n = 267) of the respondents agreed that a person who is HIV positive cannot donate a kidney, and 11% (n = 33) were not sure.

About 28% (n = 84) of the respondents in this study agreed that their families would not allow them to donate, 8.7% (n = 26) were unsure, and 63.3% (n = 190) disagreed. Thus, the majority were independent decision makers when it came to determining the fate of their own bodies.

Table 3, shows that 47.7% (n = 143) of the respondents agreed that renal donation might change their body after transplant, 40.3% (n = 121) were not sure, and 12% (n = 36) disagreed. Therefore, the majority were aware that a transplant might cause changes to the functioning of their bodies. Post-transplant changes might include insomnia, anxiety and depression.

Approximately 73% (n = 219) of the respondents agreed that they wanted to die with their body parts intact, 18% (n = 54) were not sure, and 9% (n = 27) disagreed. The aim is to maintain a balance between the

Table 2
Barriers to kidney donation (N = 300).

Items	Description	Agree	Not sure	Disagree
1	My religion does not allow me to give away a kidney	n = 22 (7.3%)	n = 38 (12.7%)	n = 240 (80%)
2	Diseases like diabetes and hypertension can prevent you from donating	n = 156 (52%)	n = 140 (46.7%)	n = 4 (1.3%)
3	Cultural beliefs prevent me from donating a kidney	n = 183 (61%)	n = 25 (8.3%)	n = 92 (30.7%)
4	I am scared to donate a kidney	n = 258 (86%)	n = 23 (8%)	n = 19 (6.3%)
5	If I am obese, so I cannot donate a kidney	n = 6 (2%)	n = 281 (93.7%)	n = 13 (4.3%)
6	If I am diagnosed with cancer. I cannot donate	n = 51 (17%)	n = 238 (79.3%)	n = 11 (3.7%)
7	If I am HIV positive, I cannot donate a kidney	n = 267 (89%)	n = 33 (11%)	0
8	My family will not allow me to donate	n = 84 (28%)	n = 26 (8.7%)	n = 190 (63.3%)

Table 3

Attitudes of clients with regard to renal donation.

Items	Descriptions	Agree	Not sure	Disagree
1	I am willing to donate a kidney	n = 40 (13.3%)	n = 103 (34.3%)	n = 157 (52.3%)
2	Renal donation might change my body after transplant	n = 143 (47.7%)	n = 121 (40.3%)	n = 36 (12%)
3	I must die with my body parts intact	n = 219 (73%)	n = 54 (18%)	n = 27 (9%)
4	Payment has to be made for organ donation	n = 48 (16%)	n = 34 (11.3%)	n = 218 (72.7%)
5	Problems that may occur after transplant prevent me from donating	n = 186 (62%)	n = 66 (22%)	n = 48 (16%)
6	A person from one race can donate a kidney to another race	n = 179 (59.7%)	n = 101 (33.7%)	n = 20 (6.7%)

objectives of transplant programmes and respect for individuals' or families' wishes regarding donation. Sixteen per cent (n = 48) of the respondents in the current study agreed that payment has to be made for organ donation, 11.3% (n = 34) were not sure, and 72.7% (n = 218) disagreed. This indicated that the majority were opposed to selling their body parts. These findings are comparable to the results obtained by Agarwal (2015), where the majority of respondents (66.4%) were against paid organ donation.

About 62% (n = 186) of this study's respondents agreed that problems might occur post-transplant, which would prevent a potential donor from donating, 22% (n = 66) were not sure, and 16% (n = 48) disagreed. This implies that the majority were cautious about the possible complications accruing to the donor. These include post-operative haemorrhage (requiring reoperation), septicaemia, fever and pulmonary embolism (Lewis et al. 2014).

Just under sixty per cent (59.7%) (n = 179) of the respondents agreed that a person could donate a kidney to someone of a different race, 33.7% (n = 101) were not sure, and 6.7% (n = 20) disagreed. This indicated that the majority believed anybody could donate to someone of a different race.

4. Discussion

4.1. Knowledge and understanding on renal donation

A study conducted by Okwuonu et al. (2015) found that participants' knowledge of the number of kidneys in the human body was good 90.2%. Their participants knew the correct number of kidneys in the human body. This corroborates with the results presented in this study, which showed that most of the respondents are knowledgeable about the number of kidneys a person has (72%).

However, irrespective of knowing the number of kidneys a person has 81.7% were not sure that kidneys remove waste and poisonous substances from the body. These results concurs with the study by Oluyombo et al. (2016a), where 10.6% of 454 respondents mentioned at least one function of the kidneys.

Twenty per cent of the respondents agreed that damaged kidneys could be replaced by another healthy kidney, whereas 74.7% were not sure, and 5.3% disagreed. This finding differs with the study conducted in Ghana (Boima et al. 2017), which stated that the diseased or damaged kidneys might be replaced by transplant, which is the preferred treatment options for most patients with advanced chronic renal failure.

Three-point three per cent (n = 10) agreed that your family could sign for your kidney donation, 35% were not sure, and 61.7% disagreed. This clearly shows reluctance on the majority of families of not giving away the body parts of their loved ones without their consent. According to a study conducted in the United States, consent to donate is less likely when there is family conflict, and a lack of rapport with healthcare providers where requests are ill-timed, and where families are

dissatisfied with care (Ralph et al. 2014).

With reference to South Africa's legislation on consent for donating organs for transplantation, this will happen if it was unless stated by the deceased prior to death in a formal witnessed statement or written declaration, consent for organ donation may be provided by the "spouse, partner, parent, guardian, major child, major brother or major sister" (National kidney foundation, 2017). Four point seven per cent 4.7% agreed that a person could be kept on dialysis while waiting for a renal transplant, and 95.3% were not sure.

This showed that the majority of the respondents do not know what dialysis is. Disappointedly, others had just heard this word for the first time. The results on the respondents' knowledge and understanding of renal donation revealed that the majority of the respondents do not have adequate knowledge of renal donation. They were not sure regarding, the functions of the kidneys and that kidneys can be donated. How can the respondents agree to renal donation when they are lacking knowledge about the functions of kidneys and renal donation? Strong recommendations are tabled in this article.

4.2. Factors that prevent the clients to volunteer donating kidneys

The results are indicated in Table 2. There are factors that prevent the respondents from volunteering to donate a kidney. They are their religion, diseases, cultural beliefs, scarcity and disagreement from their families. With regard to their religion, the results revealed that 7.3% agreed that their religion does not allow them to donate a kidney, 12.7% were not sure, and 80% (n = 240) disagreed. This indicated that the majority of religions were not against organ donation. These findings are similar to the study conducted in (Yalakshmi et al. 2016) which indicated that 101 participants out of 193 (52.3%) agreed that religious people do not oppose organ and tissue donation.

As far as diseases are concerned, 52% agreed that diseases like diabetes hypertension can prevent a person from donating an organ. Thus, the majority of the respondents know that diseases like diabetes and hypertension can prevent them from being kidney donors. It was revealed that people with diseases like diabetes and hypertension might not choose to donate because of the possibilities of developing kidney problems later in life (Jha et al. 2013).

Cultural beliefs prevent a person from donating a kidney. This statement is revealed by the majority of the respondents 61%, who indicated that cultural beliefs are the contributory factors which lead to their reluctance in donating kidneys. Therefore, the majority of the respondents follow their cultural beliefs when it comes to organ donation. As opposed to black African cultural beliefs, on attitudes to organ donation among some urban South African populations, the white population is more willing to donate their own organs and those of a relative than the black African population (Etheredge, Turner & Kahn, 2014).

Furthermore, it is scary to donate the kidneys, as revealed by 86% of the respondents who are on the majority. Fear causes unwillingness to donate the kidneys. The study by Ilori et al. (2015), on factors affecting minority patients' willingness to receive a kidney transplant at an urban safety-net hospital, found that out of 213 respondents, 106 of the respondents reported that they rely on physicians' in their willingness to undergo a kidney transplant.

The minority, of the respondents, 2% agreed that obesity could prevent a person from donating a kidney whereas 93.7% were not sure. Other respondents agreed that 17% agreed that a person diagnosed with cancer cannot donate a kidney, 79.3% were not sure. Thus the majority of the respondents were not knowledgeable about complications related to cancer. Donors with a previous history of cancer could represent an important source of organs considering that the risk of cancer transmission may be lower than previously estimated. The results showed that the majority of the respondents do not know the barriers to renal donation.

The respondents (89%) agreed that a person who is HIV positive

cannot donate a kidney, and 11% were not sure. This revealed that the respondents are aware that HIV prevents one from being an organ donor due to the threat of disease transmission. The results concur with the study by Agarwal (2015) which was conducted at Mandya, Karnataka. The study found that 76.8% of the respondents were aware that infectious diseases are a contradiction for organ donation.

Family is an important support system. About 28% of the respondents agreed that their family would not allow them to donate a kidney, 8.7% were not sure, 63.3% disagreed. Thus, the majority of the respondents are independent because they can make their own decisions without their families' decisions. The results differ with the study by Yalakshmi et al. (2016) that found that the majority of their respondents 54.9%, recognised the importance of discussing their wishes related to organ donation with their family. The factors discussed has an impact in the respondents' for taking decision regarding renal donation.

4.3. Attitudes of clients with regard to renal donation

The results to be discussed are shown in Table 3. The results revealed that, 48% of the respondents agreed that renal donation might change their body after transplant, 40.3% were not sure, and 12% (n = 36) disagreed. Therefore, the majority of the respondents were aware that a transplant might cause changes in the functioning of the body and agreed that a person could donate to anyone, even if you are not family. Post-transplant changes might include insomnia, anxiety and depression. This was supported by Pasquale et al. (2014), who conducted research on psychopathological aspects of kidney transplantations.

Approximately 73% agreed that they want to die with their body parts intact, thus they were scared to donate. The results are similar to the study by Peris et al. (2014), on opposition to organ donation, which stated that one of the most important goals of a transplant system is the primary prevention of opposition to donation in order to maintain balance between the objectives of transplant programmes and respect for wishes regarding donation. Yalakshmi et al. (2016) study results differ from this study. Their findings indicated that organ and tissue donation does not disfigure the body (83.4%). Out of 193 people interviewed, 76.2% of people supported organ donation and 62% were willing to donate organs after death.

This study revealed that, the majority of the respondents 72.7% were against selling body parts. Sixteen per cent 16% agreed that payment has to be made for organ donation. The results concurred to the study by Agarwal (2015), where 66.4% of respondents responded that no payment has to be made for donating organs. Furthermore, this study indicated that about 62% agreed that problems might occur after transplant, which prevents a person from donating. This is an indication that the majority of the respondents were cautious of complications related to transplants. The complications include postoperative haemorrhage requiring reoperation, septicemia, fever and pulmonary embolism. Similarity of this study results were found by Blohme et al. (2016), in their study on living donor nephrectomy, which found complication rates in 490 consecutive cases.

Fifty-nine point seven per cent 59.7% of the respondents agreed that a person could donate a kidney to someone of a different race, 33.7% were not sure. This indicated that the majority of the respondents believe that any person can donate to someone of a different race. The study conducted in the United States of America by Hod & Goldfarb-Rumyantzev (2014) on the role of disparities and socio-economic factors in access to kidney transplantation, differs from this study as blacks have lower access and poorer outcomes with transplantation, while whites are far more likely to receive kidney transplants.

5. Implications and recommendations

5.1. For clinical practice

Knowledge of kidney donation to be imparted by health care

personnel to the clients in and out of the health care facility.

5.2. For policy makers

Policy makers to emphasise and monitor the celebration of World Kidney Day (14 March) or World Transplant Day (6 June). Screening the of the public for diseases such as diabetes and hypertension, which are the main causes of chronic renal failure should also be emphasised and monitored . Through government initiatives, communities can be made aware of the existence of foundations which disseminate information on kidney donation. In this country, these include the National Kidney Foundation of South Africa and the Organ Donor Foundation of SA.

6. Future research

From the data collected, the researcher identified the need for a qualitative study to collect in- depth knowledge of renal donation, using focus group interviews. The literature review revealed a gap in the knowledge of health care personnel in Limpopo province, which is a concern that warrants further investigation.

7. Conclusion

The purpose of this study was to explore and describe respondents’

Appendix A

QUESTIONNAIRE
 KINDLY TICK YOUR RESPONSES IN THE APPROPRIATE BOX OF EACH QUESTION.
 Kindly note that each question must have one response.

SECTION A

DEMOGRAPHIC INFORMATION

1. Age in years

18–30	1
31–40	2
41–50	3
51–60	4
61>	5

2. Gender

Male	1
Female	2

3. Highest standard passed

Grade 1–7	1
Grade 8–11	2
Grade 12>	3

knowledge of renal donation. To this end, the researcher sampled clients at an urban health care facility in Limpopo province. The results of the study revealed that the clients’ knowledge of renal donation was inadequate, and that more extensive awareness programmes on this topic are needed.

The study investigated which factors and attitudes prevent individuals from voluntarily donating a kidney. Religion was not found to be a barrier to renal donation, nor were cultural beliefs. The majority of the respondents were, however, afraid to donate, presumably since the surgical procedure was unknown to them, and they also feared the possible complications – for the donor – associated with surgery and donation. Most respondents opposed the notion of being paid for donating. The long list of clients awaiting organs can only benefit if more information is available to the public about renal donation.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

4. Religion

Christianity	1
Traditional	2
Other	3

5. Nationality

South African	1
Non SouthAfrican	2

6. Residential area

Informal settlement	1
Rural area	2
Township	3
Urban	4

7. Marital status

Single	1
Married	2
Widow	3
Divorced	4

8. Employment status

Employed	1
Unemployed	2
Student	3
Pensioner	4

SECTION B

Knowledge and understanding on renal donation

	Agree	Not sure	Disagree
9.A normal person has two kidneys.	1	2	3
10. Kidneys remove waste and poisonous substances from our bodies.	1	2	3
11. Damaged kidneys can be replaced by another healthy kidney.	1	2	3
12. Renal donation is done when you are healthy.	1	2	3
13.Renal donation is to give away one of your kidneys if you are alive.	1	2	3

15. A person can survive with one kidney if the other one is damaged or absent.	1	2	3
16. A person can donate to anyone even if you are not family.	1	2	3
17. Your family can sign for your kidneys to be donated.	1	2	3
18. A person can be kept on dialysis while waiting for renal donation.	1	2	3

SECTION C

Factors that prevent the clients to volunteer donating kidneys.

	Agree	Not sure	Disagree
19. My religion does not allow me to give away my kidney.	1	2	3
20. Diseases like diabetes and hypertension can prevent you from donating an organ.	1	2	3
21. Cultural beliefs prevent me from donating a kidney.	1	2	3
22. I am scared to donate a kidney.	1	2	3
23. If I am obese I cannot donate a kidney.	1	2	3
24. If I am diagnosed with cancer I cannot donate.	1	2	3
25. If I am HIV positive I cannot donate a kidney.	1	2	3
26. My family will not allow me to donate.	1	2	3

SECTION D

Attitudes of clients with regard to organ donation.

	Agree	Not sure	Disagree
27. I am willing to donate a kidney.	1	2	3
28. Renal donation might change my body after transplant.	1	2	3
29. I must die with my body parts complete.	1	2	3
30. Payment has to be made for organ donation.	1	2	3
31. Problems that may occur after transplant prevent me from donating.	1	2	3
32. A person from a different race can donate a kidney to a different race.	1	2	3

References

- Agarwal, S. (2015). Are medical students having enough knowledge about organ donation? *IOSR Journal of Dental and Medical Sciences*, 14(1), 29–34.
- Baudoux, T. E. R., Gastaldello, K., Rorive, S., Hamade, A., Broeders, N., & Nortier, J. L. (2017). Donor cancer transmission in kidney transplantation. *Kidney International Reports*, 2(2), 134–137.
- Boima, V., Ganu, V., Dey, D., Yorke, E., Yawson, A., Otchere, Y., ... Mate-Kole, C. C. (2017). Kidney transplantation in Ghana: Is the public ready? *Clinical Transplantation*, 31(10), e13061. <https://doi.org/10.1111/ctr.13061>.
- Brink, H., Van der Walt, C., & Van Rensburg, G. (2018). *Fundamentals of research methodology for health care professionals* (4th ed.). Cape Town: Juta.
- Etheredge, H. R., Turner, R. E., & Kahn, D. (2014). Attitudes to organ donation among some urban South African populations remain unchanged: A cross-sectional study (1993–2013). *South African Medical Journal*, 104(2), 133–137.
- Fabian, J., & Crymble, K. (2017). End-of-life care and organ donation in South Africa: It's time for national policy to lead the way. *The South African Medical Journal*, 107(7), 545. <https://doi.org/10.7196/samj.2017.v107i7.12486>.
- Government of the Republic of South Africa. (2004). *National Health Act, 61 of 2003*. Pretoria: Government Gazette.
- Hamed, H., Awad, M. E., Youssef, K. N., Fouda, B., Nakeeb, A. E., & Wahab, M. A. (2016). Knowledge and Attitudes about Organ Donation among Medical Students in Egypt: A Questionnaire. *Journal of Transplantation Technologies and Research*, 69(1), 155. <https://doi.org/10.4172/21610991.1000155>.
- Hod, T., & Goldfarb-Rumyantzev, A. S. (2014). The role of disparities and socioeconomic factors in access to kidney transplantation and its outcome. *Renal Failure*, 36(8), 1193–1199.
- Ilori, T. O., Enofe, N., Oommen, A., Odewole, O., Ojo, O., Plantinga, L., ... McClellan, W. (2015). Factors affecting willingness to receive a kidney transplant among minority clients at a safety-net hospital: A cross-sectional survey. *BMC Nephrology*, 16, 191. <https://doi.org/10.1186/s12882-015-0186-2>.
- Jernigan, M., Fahrenwald, N., Harris, R., Tsosie, U., Baker, L. O., & Buchwald, D. (2013). Knowledge, beliefs, and behaviours regarding organ and tissue donation in selected tribal college communities. *Journal of Community Health*, 38(4), 734–740. <https://doi.org/10.1007/s10900-013-9672-2>.
- Jha, V., Garcia-Garcia, G., Iseki, K., Li, Z., Naicker, S., Plattner, B., ... Yang, C.-W. (2013). Chronic kidney disease: Global dimension and perspectives. *The Lancet*, 382(9888), 260–272.
- Lewis, S. L., Dirksen, S. R., Heitkemper, M. M., & Butcher, L. (2014). *Medical surgical nursing: Assessment and management of clinical problems* (9th ed.). Missouri: Elsevier Mosby.
- Manojan, K. K., Raja, R. A., Nelson, V., Beevi, N., & Jose, R. (2014). Knowledge and attitude towards organ donation in rural Kerala. *Academic medical Journal of India*, 2(1), 25–27.
- National kidney foundation. (2017). Organ donation and transplantation statistics. [Cited 14 Dec 2017.] Available from URL: <http://optn.transplant.hst.gov>.
- Okwuonu, C. G., Chukwuonye, I. I., Ogah, S. O., Abali, C., Adejumo, O. A., & Oviyasu, E. (2015). Awareness level of kidney functions and diseases among adults in a Nigerian population. *Indian Journal of Nephrology*, 25(3), 158–163.
- Olujobo, R., Fawale, M. B., Ojewola, R. W., Busari, O. A., Ogunmola, O. J., Olanrewaju, T. O., ... Ayodele, O. E. (2016a). Knowledge regarding organ donation and willingness to donate among health care workers in south-west Nigeria. *International Journal for Organ Transplantation Medicine*, 7(1), 19–26.
- Pasquale, D. C., Veroux, M., Indelicato, L., Sinagra, N., Giaquinta, A., Fornaro, M., & Pistorio, M. L. (2014). Psychopathological aspects of kidney transplantation: Efficacy of a multidisciplinary team. *World Journal of Transplantation*, 4(4), 267–275.
- Peris, A., Bagatti, S., Pane, P. L., & Nativi, A. (2014). Opposition to organ donation: Prevention is better than applying tactics. *Critical Care*, 18(6), 598.
- Ralph, A., Chapman, J. R., Gills, J., Butou, P., Howard, K., Irving, M., ... Tong, A. (2014). Family perspective on deceased organ donation: Thematic synthesis of qualitative synthesis. *American Journal of Transplantation*, 14(4), 923–935.
- Register of the researched urban health care facility. (2017). Consulted on-site by the researcher (pp. 50) in Polokwane, Limpopo.
- Sawinski, D., & Locke, J. E. (2018). Evaluation of kidney donors: Core curriculum 2018. *American Journal of Kidney Diseases*, 71(5), 737–747.
- Silva, R. A. R., Souza, V. L., Oliveira, G. J. N., Silva, B. C. O., Rocha, C. C. T., & Holanda, J. R. R. (2016). Coping strategies of clients on haemodialysis. *Escola Anna Nery*, 20(1), 147–154.
- Thomson, D. (2017). Organ donation in South Africa. *South African Journal of Critical Care*, 33(2), 36–37.
- Thomson, E. M., & McKeown, D. W. (2012). Organ donation and management of the potential organ donor. *Anaesthesia and Intensive Care Medicine*, 13(6), 252–258.

Timmerman, L., Ismael, S. Y., Luchtenburg, A. E., Zuidema, W. C., IJzermans, J. N. M., Busschback, J. V., Welmar, E., & Massey, E. K. (2015). Exploring knowledge about dialysis, transplantation, and living donation among clients and their living kidney donors. *International Journal of Behavioral Medicine*, 22(5), 580–589.

Urden, L. D., Stacy, K. M., & Lough, M. E. (2011). *Critical care nursing diagnosis and management* (6th ed.). St Louis: Elsevier.

Yalakshmi, P. V., Sunitha, T. S., Gandhi, S., Thimmaiah, R., & Math, S. B. (2016). Knowledge, attitude and behaviour of the general population towards organ donation: An Indian perspective. *The National Medical Journal of India*, 29(5), 257–261.