

Quality of Life in Living Kidney Donors Grenoble Teaching Hospital (France)

Manzan Edwige Anastasie Wognin^{1,2*}, Abdoul Yannick Gonan¹, Kéhi Jonathan Kpan¹,
Monlet Cyr Guei^{3,4}, Konan Nguessan Michel^{4,5}, Christ Ziahy Reine Marie¹,
Tia Weu Melanie^{1,2}, Bourhaima Ouattara^{1,2}, Lionel Rostaing⁶

¹Department of Internal Medicine, Nephrology, Hemodialysis, Teaching Hospital of Bouaké, Bouaké, Ivory Coast

²Medical Sciences Training and Research Unit, Alassane Ouattara University, Bouaké, Ivory Coast

³Nephrology, Hemodialysis and Kidney Transplantation Department, Yopougon Teaching Hospital, Abidjan, Ivory Coast

⁴Medical Sciences Training and Research Unit, Félix Houphouët Boigny University, Abidjan, Ivory Coast

⁵Department of Internal Medicine, Teaching Hospital of Abidjan, Abidjan, Ivory Coast

⁶Department of Nephrology, Hemodialysis, Apheresis and Renal Transplantation, Grenoble Teaching Hospital, Grenoble, France

Email: *anastasiewognin@yahoo.fr

How to cite this paper: Wognin, M.E.A., Gonan, A.Y., Kpan, K.J., Guei, M.C., Michel, K.N., Marie, C.Z.R., Melanie, T.W., Ouattara, B. and Rostaing, L. (2024) Quality of Life in Living Kidney Donors Grenoble Teaching Hospital (France). *Open Journal of Nephrology*, **14**, 313-323.

<https://doi.org/10.4236/ojneph.2024.143029>

Received: October 5, 2023

Accepted: August 12, 2024

Published: August 15, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution-NonCommercial International License (CC BY-NC 4.0).

<http://creativecommons.org/licenses/by-nc/4.0/>



Open Access

Abstract

Context: Kidney transplantation is today the standard treatment for patients suffering from chronic end-stage renal failure. Living kidney donation offers many advantages for the recipient, but requires a subject without comorbidities to undergo surgery. The aim of this study was to assess the quality of life and psychosocial experience of living kidney donors after donation. **Methods:** This was a cross-sectional study with an analytical aim, involving living kidney donors during the period from January 2016 to April 2019 at CHUGA. (University Hospital Center of Grenoble Alpes in France). **Results:** Our study shows that out of 88 donors, 70 responded to our questionnaires, representing a prevalence of 80.5%. The average age of our donors was 55.6 years with a female predominance. Seven out of eight domains of the SF36 score had a good quality of life after donation and the donation did not alter their psychosocial experience. The majority of our donors expressed their pride and enthusiasm, did not regret having saved a life, and this experience was considered positive. **Conclusion:** Kidney donation does not have a negative impact on quality of life and psychosocial life. The majority of donors do not regret their donation. The dissemination of such results could make it possible to increase the number of kidney transplants from living donors in France, especially in our African countries where the management of ESRD remains a real public health problem.

Keywords

Quality of Life, Kidney Donors, Psychosocial Life

1. Introduction

Kidney transplantation is the standard treatment for patients with chronic end-stage renal disease. Although it has long been known that the quality of life of a transplant patient is better than that of a dialysis patient, it has taken longer to demonstrate that transplantation also provides a better life experience. It was a study taken from the United States Renal Data System (USRDS) registry which made it possible for the first time to demonstrate this advantage conferred by transplantation [1]. In France, 16% of kidney transplants were carried out from living donors in 2021 [2], compared to 14% in 2020 [3]. In a review of studies conducted with the Medical Outcome Survey Short Form 36-items (MOS SF-36) as well as a recently published study, the quality of life of donors is as good as the quality of life of the general population, again higher than that of healthy subjects [2] [4]. However, other studies highlight a deterioration in the quality of life of donors after donation. Our study aims to reassess the psychosocial experience and quality of life of living kidney donors at Grenoble University Hospital.

2. Patients and Methods

The present study took place in the nephrology, hemodialysis, apheresis, kidney transplantation department of the Grenoble Alpes University Hospital in France. These were living kidney donors between January 2016 and April 2019 at Grenoble Alpes University Hospital. During the defined period, living kidney donors aged at least 18 years, residing in France and having given their consent for the study were included. Donors whose medical records were unusable were not included. This was a retrospective cross-sectional study. This survey was carried out by self-administered questionnaires using standardized instruments. The survey is transversal for measurements of health status and quality of life, collected at the time of measurement, it is retrospective for reconstructions of the donation process.

The data was collected using pre-established survey forms bearing anonymity numbers which noted:

- socio-demographic aspects (age, sex, level of education, family ties linked to the beneficiary).
- clinical aspects (blood pressure, body mass index, year of donation).
- biological aspects (creatinemia, GFR, proteinuria and hematuria).
- the post-donation psychosocial experience (general state of health, advice on donation, experience of donation, self-esteem for the act performed, relationships with the recipient, feeling of solidarity, relationships with those around them, reflection on those around them, empowerment of the recipient, adaptation working conditions, loss of your job).

A standardized questionnaire was used:

- the generic 36-item Medical Outcome Survey Short Form (MOS SF-36) questionnaire is currently the most widely used instrument internationally. It is validated in French and also allows comparisons to be made with other

pathologies [5]. This questionnaire, made up of 36 items, allows profiles to be established using Likert scales. It explores eight dimensions of health and quality of life:

- Physical functioning (10 items): measures limitations in physical activities such as walking, climbing stairs, bending forward, lifting objects, as well as heavy and intense efforts;
- Limitations due to physical condition (4 items): measure discomfort, due to physical condition, in daily activities: measures the limitations of certain activities or the difficulty in performing them;
- Physical pain (2 items): measures the intensity of pain and the discomfort caused;
- Mental health (5 items): measurement of anxiety, depression, well-being;
- Limitations due to mental state (3 items): measures discomfort, due to mental state, in daily activities: less time spent at work, sloppy work;
- life and relationships with others (2 items): measures limitations in social activities, due to physical and mental problems;
- Vitality (4 items): measure of vitality, energy, fatigue;
- General health (5 items): measures general health, resistance to diseases.

It is also possible to calculate a physical summary score and a mental summary score from the eight dimensions. Donor and recipient medical data at the time of harvest and transplantation, after transplantation and at one year were extracted from the CRISTAL registry. The donor-recipient relationship, the date of birth and the sex of the donor as well as all medical monitoring data, collected in CRISTAL, were extracted for the study. These included donor height and weight, blood pressure and renal assessment, date and type of surgery, major intraoperative complications, postoperative complications, discharge date, and the first hospitalization.

The SF36 quality of life score:

- o SF36 [5].
 - Score = 50: average quality of life;
 - Score below 50: poor quality of life;
 - Scores of 50 or more: good quality of life.
- o Quality of life (QoL): From a medical point of view, the WHO defined quality of life in 1993 as “an individual’s perception of his or her place in life, in the context of culture and system of values in which he lives”, in relation to his objectives, his expectations, his standards and his concerns.
- o Living donor (DVA): Person who donates an organ, most often a kidney, during their lifetime.
- o Respondents: donors who agreed to return the survey form to us.
- o Recipients: patients who have benefited from a kidney donation.
- o Physiological proteinuria: 100 - 150 mg or <0.2 g/24 hours.
- o The CRI was selected for a GFR < 60 ml/min/1.73m².

The entry and processing of Data collected on a survey form were entered into EXCEL software and analyzed using SPSS version 21. Quantitative variables

were expressed as mean \pm standard deviation and qualitative variables as frequency or proportions. Quantitative variables were compared using the reduced deviation test for large samples ($N \geq 30$) and Student for small samples ($N < 30$) on an independent sample and to qualitative variables using the Chi² test. A p value less than 0.05 was considered statistically significant.

3. Results

- Epidemiological data

During the study period, 447 patients received a kidney transplant, including 87 from living donors. A total of 70 people responded to our questionnaires, representing a participation rate of 80%. The mean age of living donors was 55.6 ± 13 years, with extremes of 18 and 80 years at the time of donation. The age group of 50 to 60 years represented 32.40% of living donors (**Table 1**).

In our series, 43 were women (61%) with a sex ratio of 0.63. Living donors with an education level equivalent to elementary level represented 79.3% of cases (**Table 2**)

Table 1. Distribution of the 70 donors according to age for the time of donation.

age range	Numbers (n)	%
<30	02	03.40
[30 - 40[	04	08.00
[40 - 50[	10	18.40
[50 - 60[	22	32.40
[60 - 70[	14	20.70
[70 - 80[	11	16.10
≥ 80	01	01.10
Total	70	100.00

Table 2. Distribution of the 70 donors according to the education level.

Niveau de scolarisation	Effectif (n)	Proportion (%)
Élémentaire	56	79.3
Secondaire	10	14.9
Universitaire	4	5.7
Total	70	100.0

- History of the transplant

In our study, spouses represented 40% among living donors. The duration of donation was 3 to 4 years in 25 donors or 36%. In the series, post-donation follow-up was good in the majority (97.28%). The donors all benefited from laparoscopy as a surgical technique.

- Clinical data

Mean blood pressure was normal in 96% of donors. Overweight was noted in 40 donors or 60%.

- Paraclinical data

There was a slight increase in post-donation renal function with serum creatinine above 100 micromoles/l in 42 patients, or 60%. The glomerular filtration rate was greater than 60 ml/min in 63% of donors with normal proteinuria in 83% of donors.

- Psychosocial experience

In our study, health status was poor in only 8.6% of cases. In total, 97% of donors would recommend donating to another person. The donation experience was bad for 03% of donors. Self-esteem or enthusiasm for donating was found in 88.6% of donors. In our work, social relationships with those around us or family were understandable in 85.72%. Donors' loved ones perceive the donation as an act of heroism in 44% of cases. No vocational rehabilitation was observed in 87.1% of donors. Post-donation anxiety is found in 55.7% of donors.

- Quality of life

Quality of life was poor in the physical role domain in men with no significant difference ($p > 0.05$). In our series, 97% of donors had a quality of life score greater than 50%. Overall quality of life was good in 97.10% of donors.

Table 3. Allocation of donors based on good quality of life.

Quality of life elements	Quality of life score > 50%	
	Numbers (n)	%
Body pain	69	100.00
Perceived health	67	97.10
Vitality	67	97.10
Social relationship	67	97.10
Physical functioning	66	95.70
Emotional role	65	94.20
Mental health	62	89.90
Physical role	53	76.80
Overall quality of life	67	97.10

4. Discussion

The quality of life of living kidney donors remains better in general and there is an age-related prevalence.

At the end of our study, the average age was 55.6 years. The majority of donors were women (61%). Our results corroborate those of Franquet who found an average age of 50 years and a female predominance of 64% [6]. The Garcia and Menjivar series respectively find an average age of 41.02 and 50.18 years [7] [8]. According to a meta-analysis, the average age of living kidney donors in

2017 is 51.3 years with an increase from 2 years to 10 years. Nearly 21% of donors are aged 60 and over in France [9]. This female predominance in our series and elsewhere could be explained by the fact that women perceive donation as a family obligation and it is the woman who gives life. However, some authors found no difference in gender distribution [10]. In our series, the living kidney donors were respectively the spouses followed by collaterals then ascendants as well as descendants all having family or emotional ties. These results are similar in the literature according to a meta-analysis carried out in 2017 in France; of the 611 transplants, the donors and recipients were genetically related [11]. In our study population, all our donors benefited from better medical monitoring and the only technique used was laparoscopy. According to the literature, differences in surgical techniques appear to have little relationship to quality of life outcomes [12]. In our work, rare complications such as urinary infections and pneumothorax were found (1.3%). Pain immediately after collection was noted in all donors to varying degrees, as with any surgical procedure. Unlike Garcia's study which found a prevalence of 8%, the presence of a perioperative complication was associated with lower quality of life related to mental health and higher symptoms of depression 3 months after donation; none of these differences persisted at 12 months [13]. Furthermore, for other authors, perioperative complications were not associated with quality of life related to physical health or anxiety 3 months after donation [14]. Donation is medically considered to be a practice with minimal morbidity and mortality for the donor and therefore acceptable, provided that contraindications to donation have been eliminated by appropriate medical evaluation. The majority of donors did not perceive a significant change in their appearance and were not embarrassed or considered their nephrectomy scar unattractive. And that they had no impact on their state of health and their quality of life. The average BMI of the donor population was 28.85 kg/m² with extremes of 17.06 and 41.93. In our series, 47% of donors were overweight with a body mass index (BMI) of 25 kg/m², among them 13% were obese with a BMI of 30 kg/m². Our results agree with those of Franquet in France who found an average BMI of 24.3 kg/m² [7]. After any nephrectomy, there is compensatory hyperfiltration in the remaining kidney which results in a reduction in GFR of approximately 30% [15]. A study conducted in 2002 on predominantly Caucasian living donors followed for up to 20 years in one center did not find a link between the drop in post-donation glomerular filtration rate (GFR) and the risk of developing renal failure [16]. A study of 3956 predominantly Caucasian kidney donors found that 36% of them had a GFR < 60 ml/min per 1.73 m², which corresponds to stage 3 of chronic kidney failure according to the KDIGO classification. a median period of 9.2 years after donation, and 2.6% had a GFR < 30 ml/min per 1.73 m² (at CKD stage 4) at a median of 23.9 years [17]. A meta-analysis found that after an average of 10 years of follow-up, 12% of donors had a GFR between 30 and 59 ml/min, while only 0.2% had a GFR between 30 ml/min [18]. In our study population, we found a GFR of 60 ml/min in 63% of our donors and we also noted higher proteinuria in women (20.93%).

Body mass index (BMI) was low with a p-value of 0.4, which was not significant. However, some authors found higher post-donation proteinuria in men and in those with a higher body mass index (BMI) [5]. As in the general population, the risk of developing chronic kidney disease varies depending on certain predisposing factors such as race. Furthermore, a study of 4650 donors in the United States found that 7 years after donation, a greater proportion of melanoderma donors than Caucasian donors had CKD [17]. Almost all donors were in good health, *i.e.* 90%. They reported that their general health remained unchanged after a greater proportion of melanoderma donors than Caucasian donors had CKD [18]. Almost all donors were in good health, *i.e.* 90%. Almost all donors were in good health, *i.e.* 90%. The literature states that the life expectancy of donors is not reduced. It would even be higher than that of the general population, which demonstrates that the state of health of selected donors remains perfect at the time of donation [8]. Renal sampling therefore does not alter the state of health of the donor who is a subject without comorbidity. The majority of donors in our sample are satisfied with having saved a life, do not regret this donation and that their experience was worth it, *i.e.* 88.6%. Several studies have reported evidence demonstrating that living kidney donation does not compromise the psychological outcome of the donor, and even constitutes an extremely positive experience for the donor [19]. In Kessler's series, he found persistent feelings of accomplishment, pride, and enhanced self-esteem in the donor [20]. In contrast, Johson EM *et al.* in a cohort of 524 donors noted that living kidney donors whose recipients had died would not advise donation, regretted the decision to donate and were therefore dissatisfied [21], which is discordant with our study. The general experience of donating after several studies seems enriching for donors. We saw 12.9% vocational rehabilitation in our work due to some donors being limited by certain strenuous physical activities such as heavy lifting and driving. Some donors reported feeling anxious about the daily activities of life, namely dressing, moving, vacuuming [22]. Residual pain immediately after collection was noted in all donors to varying degrees, as with any surgical procedure. Donation is medically considered to be a practice with minimal morbidity and mortality for the donor and therefore acceptable, provided that contraindications to donation have been eliminated by appropriate medical evaluation. The majority of donors did not perceive a significant change in their appearance and were not embarrassed or considered their nephrectomy scar unattractive. And that they had no impact on their state of health and their quality of life. In our series, almost all of our donors had an improvement in their relationships with those around them as well as with the recipient, *i.e.* 90%, as has been described in the literature. In particular, the rapprochement of certain spouses who often felt in debt has been described by certain authors [23]. This family support reflects the high degree of brotherhood, the strong warmth of interpersonal relationships which characterize families in Europe and above all social cohesion. No donor has been abandoned by those around them. In our series, some donors reported a post-donation financial loss of 12.9%. Thus, several studies have

shown the existence of financial difficulties, particularly in relations with mutual societies for the coverage of costs incurred, in the context of insurance premiums or when applying for a real estate insurance loan [24]. The leave required for recovery resulted in some donors losing their jobs [3]. Indeed, impacts on the mental health status of donors several years after nephrectomy. The authors rarely described concerns related to anxiety and depression. In our series, anxiety was found in 55.7% of donors, this being mainly linked to late recovery after surgery. Like any surgical intervention, this is a non-trivial procedure. Similarly, a new study of 193 living kidney donors in the United States, assessed 1, 6, 12, and 24 months after donation, found that 21% (n = 32) reported the emergence of anxiety due to the progressive onset of renal failure during the post-donation evaluation period, but this anxiety dissipated in 35% (11 of 32) [10]. According to studies, anxiety and depression are significantly related to donation [11]. Furthermore, a systematic review assessing the psychosocial health of living kidney donors found that the majority of donors scored high on health-related quality of life measures [12]. Psychosocial health was generally unchanged after donation, it was similar to that of the general population. A minority of donors experienced negative psychosocial consequences such as depression, anxiety, stress, and lower quality relationships. It is reassuring that most donors did not regret their decision to donate and started the process again, even in the rare circumstances where the recipient experiences a poor outcome [16]. However, Graft loss and recipient death have been associated with an increased risk of post-donation depression treatment in some studies [25]. The use of donor quality of life questionnaires has been shown to be very useful in assessing outcomes. In our series, 7 areas of quality of life remain above 50 out of 8. It appears from our series that the highest score remains in the area of vitality at 88.2% among women and the lowest in the area of physical role at 46.3%. In his series, Padrao MB reports a deterioration in the physical role score, physical functioning, vitality and body pain [5]. Frade IC found negative emotions and perceptions in the physical domain and social functioning in its donors explaining anxiety and depression immediately after donation [17]. Additionally, Sommerer *et al.* also found a low score for physical functioning and body pain, especially in women [25]. According to a study conducted by Clemens *et al.*, they found that of the 29 studies measuring quality of life after donation, the quality of life score remained statistically higher in living donors than in the general adult population [26]. Our work shows that the different areas of quality of life remain satisfactory after nephrectomy. This is explained by the fact that the selection of different donors is very rigorous, the donors do not present any comorbidity. After the donation, they benefit from medical monitoring and special attention from those around them.

5. Conclusion

Overall, 97% of living donors were satisfied with their donation and their quality of life after donation was good. This observation reflects the rigor in the selec-

tion of donors. The benefits to others far outweigh any difficulties they may have encountered personally. The donor's decision was made without hesitation or constraint. All the DVA are ready to do it again if it were possible. All they ask is that their act be recognized symbolically for its fair value, which is not always the case. Their testimonies, based on real-life experience, are a sincere and effective plea for the development of transplantation from living donors.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Wolfe, R.A., Ashby, V.B., Milford, E.L., Ojo, A.O., Ettenger, R.E., Agodoa, L.Y.C., *et al.* (1999) Comparison of Mortality in All Patients on Dialysis, Patients on Dialysis Awaiting Transplantation, and Recipients of a First Cadaveric Transplant. *New England Journal of Medicine*, **341**, 1725-1730. <https://doi.org/10.1056/nejm199912023412303>
- [2] Asehnoune, K., Badet, L., Beloucif, S., *et al.* (2021) ABM et des activités savantes impliquées en Recommandations formalisées d'experts sur le prélèvement et la greffe à partir de donneurs vivants. Paris.
- [3] Wang, L., Zhu, L., Xie, X., *et al.* (2020) Long-Term Outcomes of Laparoscopic versus Open Donor Nephrectomy for Kidney Transplantation: A Meta-Analysis. *American Journal of Translational Research*, **12**, 5993-6002.
- [4] Briançon, S., Germain, L., Baudelot, C., Bannay, A., Virion, J.-M. and Thuong, M. (2011) Rapport qualité de vie des donneurs vivants de rein Étude QV DVR transversale. *Néphrologie & Thérapeutique*, **7**, S1-S39. [https://doi.org/10.1016/s1769-7255\(11\)70007-4](https://doi.org/10.1016/s1769-7255(11)70007-4)
- [5] Padrão, M.B. and Sens, Y.A.S. (2009) Quality of Life of Living Kidney Donors in Brazil: An Evaluation by the Short Form-36 and the WHOQOL-Bref Questionnaires. *Clinical Transplantation*, **23**, 621-627. <https://doi.org/10.1111/j.1399-0012.2009.01048.x>
- [6] Franquet, Q., Terrier, N., Badet, L., Matillon, X., Rambeaud, J.J., Crouzet, S., *et al.* (2019) Prélèvement de rein pour transplantation a donneur vivant, Suites opératoires et évolution des donneurs. Évaluation bicentrique des pratiques sur 425 cas. *Progrès en Urologie*, **29**, 732. <https://doi.org/10.1016/j.purol.2019.08.194>
- [7] Garcia, M.F.F.M., Andrade, L.G.M. and Carvalho, M.F.C. (2012) Living Kidney Donors—A Prospective Study of Quality of Life before and after Kidney Donation. *Clinical Transplantation*, **27**, 9-14. <https://doi.org/10.1111/j.1399-0012.2012.01687.x>
- [8] Menjivar, A., Torres, X., Manyalich, M., Fehrman-Ekholm, I., Papachristou, C., de Sousa-Amorim, E., *et al.* (2020) Psychosocial Risk Factors for Impaired Health-Related Quality of Life in Living Kidney Donors: Results from the ELIPSY Prospective Study. *Scientific Reports*, **10**, Article No. 21343. <https://doi.org/10.1038/s41598-020-78032-8>
- [9] Kasiske, B.L., Anderson-Haag, T., Israni, A.K., Kalil, R.S., Kimmel, P.L., Kraus, E.S., *et al.* (2015) A Prospective Controlled Study of Living Kidney Donors: Three-Year Follow-Up. *American Journal of Kidney Diseases*, **66**, 114-124. <https://doi.org/10.1053/j.ajkd.2015.01.019>
- [10] Garg, A.X., Muirhead, N., Knoll, G., Yang, R.C., Prasad, G.V.R., Thiessen-Philbrook, H., *et al.* (2006) Proteinuria and Reduced Kidney Function in Living Kidney Do-

- nors: A Systematic Review, Meta-Analysis, and Meta-Regression. *Kidney International*, **70**, 1801-1810. <https://doi.org/10.1038/sj.ki.5001819>
- [11] Matas, A.J., Vock, D.M. and Ibrahim, H.N. (2018) GFR \leq 25 Years Postdonation in Living Kidney Donors with (vs. without) a First-Degree Relative with ESRD. *American Journal of Transplantation*, **18**, 625-631. <https://doi.org/10.1111/ajt.14525>
- [12] Clemens, K.K., Thiessen-Philbrook, H., Parikh, C.R., Yang, R.C., Karley, M.L., Boudville, N., *et al.* (2006) Psychosocial Health of Living Kidney Donors: A Systematic Review. *American Journal of Transplantation*, **6**, 2965-2977. <https://doi.org/10.1111/j.1600-6143.2006.01567.x>
- [13] Garcia-Ochoa, C., Feldman, L.S., Nguan, C., Monroy-Cuadros, M., Arnold, J., Boudville, N., *et al.* (2019) Perioperative Complications during Living Donor Nephrectomy: Results from a Multicenter Cohort Study. *Canadian Journal of Kidney Health and Disease*, **6**, 1-14. <https://doi.org/10.1177/2054358119857718>
- [14] Clemens, K., Boudville, N., Dew, M.A., Geddes, C., Gill, J.S., Jassal, V., *et al.* (2011) The Long-Term Quality of Life of Living Kidney Donors: A Multicenter Cohort Study. *American Journal of Transplantation*, **11**, 463-469. <https://doi.org/10.1111/j.1600-6143.2010.03424.x>
- [15] Timmerman, L., Laging, M., Westerhof, G.J., Timman, R., Zuidema, W.C., Beck, D.K., *et al.* (2015) Mental Health among Living Kidney Donors: A Prospective Comparison with Matched Controls from the General Population. *American Journal of Transplantation*, **15**, 508-517. <https://doi.org/10.1111/ajt.13046>
- [16] Ibrahim, H.N., Foley, R., Tan, L., Rogers, T., Bailey, R.F., Guo, H., *et al.* (2009) Long-Term Consequences of Kidney Donation. *New England Journal of Medicine*, **360**, 459-469. <https://doi.org/10.1056/nejmoa0804883>
- [17] Frade, I.C., Lopes, A., Fonseca, I., *et al.* (2011) Impact Assessment in Living Kidney Donation: Psychosocial Aspects in the Donor. *Transplantation Proceedings*, **40**, 677-681. <https://doi.org/10.1016/j.transproceed.2008.02.036>
- [18] Reimer, J., Rensing, A., Haasen, C., Philipp, T., Pietruck, F. and Franke, G.H. (2006) The Impact of Living-Related Kidney Transplantation on the Donor's Life. *Transplantation*, **81**, 1268-1273. <https://doi.org/10.1097/01.tp.0000210009.96816.db>
- [19] Leiser, D.B., Thomas, A.G., Shaffer, A.A., Veale, J.L., Massie, A.B., Cooper, M., *et al.* (2020) Patient and Kidney Allograft Survival with National Kidney Paired Donation. *Clinical Journal of the American Society of Nephrology*, **15**, 228-237. <https://doi.org/10.2215/cjn.06660619>
- [20] Kessler, M. (2008) Transplantation rénale à partir d'un donneur vivant. Aspects éthiques. *Néphrologie & Thérapeutique*, **4**, 46-48. <https://doi.org/10.1016/j.nephro.2007.07.007>
- [21] Johnson, E.M., Anderson, J.K., Jacobs, C., Suh, G., Humar, A., Suhr, B.D., *et al.* (1999) Long-Term Follow-Up of Living Kidney Donors: Quality of Life after Donation. *Transplantation*, **67**, 717-721. <https://doi.org/10.1097/00007890-199903150-00013>
- [22] Vernadakis, S., Marinaki, S., Darema, M., Soukouli, I., Michelakis, I.E., Beletsoti, C., *et al.* (2021) The Evolution of Living Donor Nephrectomy Program at a Hellenic Transplant Center. Laparoscopic vs. Open Donor Nephrectomy: Single-Center Experience. *Journal of Clinical Medicine*, **10**, Article 1195. <https://doi.org/10.3390/jcm10061195>
- [23] Mamzer-Bruneel, M., Fournier, C. and Legendre, C. (2010) La transplantation rénale à partir de donneurs vivants. *Médecine/Sciences*, **26**, 522-525. <https://doi.org/10.1051/medsci/2010265522>

- [24] Habbous, S., Arnold, J., Begen, M.A., Boudville, N., Cooper, M., Dipchand, C., *et al.* (2018) Duration of Living Kidney Transplant Donor Evaluations: Findings from 2 Multicenter Cohort Studies. *American Journal of Kidney Diseases*, **72**, 483-498.
<https://doi.org/10.1053/j.ajkd.2018.01.036>
- [25] Sommerer, C., Estelmann, S., Metzendorf, N.G., Leuschner, M. and Zeier, M. (2018) Gender Disparity in Health-Related Quality of Life and Fatigue after Living Renal Donation. *BMC Nephrology*, **19**, Article No. 377.
<https://doi.org/10.1186/s12882-018-1187-8>
- [26] Port, F.K., Dykstra, D.M., Merion, R.M. and Wolfe, R.A. (2005) Trends and Results for Organ Donation and Transplantation in the United States, 2004. *American Journal of Transplantation*, **5**, 843-849.
<https://doi.org/10.1111/j.1600-6135.2005.00831.x>