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Factors that influence the attitude of East European residents in Spain towards living kidney donation

Antonio Ríos,[1,2] Laura Martínez-Alarcón,[1,2] José Sánchez,[3] Nicholas Jarvis,[1] Dolores Guzmán,[3] Pascual Parrilla[2] and Pablo Ramírez[1,2]

1 Coordinación Regional de Trasplantes de la Comunidad Autónoma de Murcia, Consejería de Sanidad, Murcia, Spain
2 Departamento de Cirugía. Hospital Universitario Virgen de la Arrixaca, El Palmar, Servicio Murciano de Salud, Murcia, Spain
3 Asociación de Ayuda al Enfermo Renal (ADAER), Murcia, Spain

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Correspondence
Dr. Antonio Ríos Zambudio, Avenida de la Libertad no 208, Casillas, 30007 Murcia, Spain. Tel.: 34.968.27.07.57; fax: +34.968. 36.94.38; e-mail: arzrios@teleline.es

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Summary

Emigration from East European (EE) countries into the South East of Spain (SES) is becoming more common. The objective of this study was to analyse the attitude towards living kidney donation in this group. A sample of residents ($n = 320$) in the SES who come from EE was obtained randomly and stratified by a respondent's nationality (November-05 to April-06). Attitude was evaluated using a validated questionnaire that was completed anonymously and was self-administered. Control group: native Spanish citizens. The questionnaire completion rate was 83% ($n = 265$). A total of 83% ($n = 220$) were in favor of related living donation. Attitude is similar to that of the urban control group ($P = 0.0534$) and more positive than that prevalent in the rural setting ($P < 0.001$). The variables that were related to attitude included: a respondent's marital status ($P < 0.001$); the country of origin ($P = 0.014$); attitude towards deceased donation ($P < 0.001$); having discussed the subject within the family ($P < 0.001$); a respondent's belief that he might need a transplant organ ($P = 0.002$) and concern about possible 'mutilation' after donation ($P < 0.001$). There is a favorable attitude towards related living kidney donation among EE who are resident in the SES and this attitude is closely related to attitude towards deceased donation, the attitude of one's family and feelings of reciprocity.

Introduction

Optimal organ donation is achieved when donations are maximized with being the least detrimental to the donors. In this respect, deceased donation is of interest, because it does not involve the mutilation of a living being and it improves the health and quality of life of the recipient [1]. Although, in regard to kidney donation, it is true that kidneys of deceased donors have less life as compared with living donor kidneys, an advantage of deceased donation is that we avoid having to remove a kidney from a healthy donor. However, even in Spain which has the highest deceased organ donation rate (34.2 per million population), this type of donation is insufficient because the number of patients on the waiting list is increasing at a faster rate than the number of transplants carried out (3945 transplantations) [2,3]. In order to alleviate this problem, living donation is being encouraged in order to reduce the deficit, given that this therapeutic option is ethically acceptable and also given the low level of risk for the donor and the good clinical results achieved [4,5]. However, in spite of most Spanish transplant centers having an ongoing living donor transplant program and most healthcare professionals being in favor, at present this type of donation is minimal (2% in liver and 6% in kidney in 2007) [2,6–8]. What is more, it has been seen that Spanish patients on the transplant waiting list are reluctant to accept an organ from a family

member because they believe that they could obtain a deceased organ and thus avoid the mutilation of a family member. Only 35% of patients on the waiting list would accept a related living donor organ, whilst 60% would prefer to wait their turn for a cadaveric organ) [9,10].

Currently, immigration in Spain is becoming more common and creating a new social and demographic reality [11,12]. This phenomenon is having its impact in the field of transplantation also as there has been a significant increase in the number of non-native patients on the transplant waiting list, and organ requests are being considered even from non-native families [2,13; (according to the ONT; (verbal communication G. Garrido, ONT, June, 2008)]. Citizens of East European origin are a population group that is growing in Spain. However, living kidney donation rates in their countries of origin are not, in most cases, above those of Spain [14]. The reasons for this deficit in East Europe are possibly different from those of Spain. Therefore, the study of these population groups in our country is especially interesting if we want to maximize living organ donation, given the lack of success in the native population in Spain [9,10].

The objectives of this study were: (a) to determine the attitude of the native populations originating from East European countries who, on immigration, reside in the South East of Spain towards living kidney donation for transplantation; and (b) to analyse the many epidemiologic and psychosocial factors that could affect this attitude.

Methods

Study population

A random sample was obtained of the population aged ≥15 years who reside in the Autonomous Community of Murcia in the South East of Spain and who had been born in any of the East European countries. The sample was stratified according to the respondent's nationality (n = 320). The sample was stratified by age and gender for each nationality and according to the available data. In order to find out the population with these characteristics, the latest census of inhabitants from this Community was used as a reference in which there is a record of the legally immigrated population who had been born in these countries. This municipal census is for the year 2003 and the total population in our Autonomous Community was 1 269 230 inhabitants. The population from East Europe living permanently and legally in this area was 8501 people (http://www.ine.es/inebase/cgi/axi). In addition, there is a certain extent of the population that has not immigrated legally and in order to estimate the number of these, many immigration charities were consulted. These groups indicated anonymously that there are approximately 100 000 more citizens without the necessary documentation who could be living in our Regional Community. While East Europe comprised many nationalities as shown in Table 1, most of such residents come from just five countries: Ukraine, Romanía, Poland, Bulgaria, and Russia.

The sample error for a confidence level of 95.5% (2 sigmas), K = 2, was estimated to be between e ± 1.93 for the whole sample, $P = q = 0.5$.

Data collection procedure

The instrument used to collect data was a questionnaire with questions divided into different categories, some with only one response option and others with multiple response options (Annex 1). The questionnaire was based on surveys used in our local area [7,8,15–18]. A pilot study was carried out between May and August 2005 in order to confirm and validate the questionnaire in this

Table 1. Distribution of respondents according to nationality and attitude towards related living kidney donation.

Country	Legal residents	Estimated residents*	Sample obtained	Attitude in favor	Attitude against	Undecided attitude
Ukraine	3.671	32.000	92	72 (78%)	20 (22%)	0
Romania	1.135	26.000	79	61 (77%)	15 (19%)	3 (4%)
Poland	255	18.000	37	37 (100%)	0	0
Bulgaria	1.507	12.000	19	16 (84%)	3 (16%)	0
Russia	746	10.000	22	18 (82%)	4 (18%)	0
Lithuania	700	3.000	2	2 (100%)	0	0
Hungary	59	2.500	3	3 (100%)	0	0
The Czech Republic	47	2.500	3	3 (100%)	0	0
Moldova	63	2.500	2	2 (100%)	0	0
Armenia	29	2.500	2	2 (100%)	0	0
Other Countries	289	1.600	4	4 (100%)	0	0
TOTAL	8.501	112.600	265	220 (83%)	42 (16%)	3 (1%)

*Total of legal residents and those estimated to be illegal according to immigration charities.

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population group. The main constraint identified in certain subgroups was the language of the questionnaire and therefore the respondent was given the option of choosing from among the questionnaires available in Spanish, English, French and German.

The questionnaire was self-administered and completed anonymously. It took 3 to 5 min to complete. The whole process was supervised by five collaborators from the Regional Transplant Center. Of these healthcare workers, two had some knowledge of East European culture and language, and if there was a language barrier, they acted as translators. They had been trained earlier and the study was carried out between November 2005 and April 2006.

Variables analysed

Attitude towards related and unrelated living kidney donation was analysed as the dependent variable and the independent variables analysed were: 1) age; 2) gender; 3) marital status (single, married, divorced-separated or widowed); 4) descendents; 5) level of education; 6) country of origin; 7) attitude towards deceased organ donation; 8) personal experience (family member or friend) related to organ donation or transplantation; 9) participation in voluntary type pro-social activities; 10) having discussed the subject of organ donation and transplantation within the family; 11) a partner's attitude towards organ donation and transplantation; 12) a respondent's religion; 13) knowledge of the attitude of one's religion towards organ donation and transplantation; and 14) concern about possible mutilation after donation.

Control group

The population of our Regional Community was used as a control group in two geographic areas: one rural and one urban. Their attitude towards living kidney donation had been measured in a study carried out between January and August 2001 and which has already been published. In the urban setting, 245 out of 250 surveys had been completed and 29% were in favor of living kidney donation, a figure that increases to 89% if donation is only concerned about related living. In the rural setting, only 65 out of the 155 surveys given out were completed (44%). Most (56%) respondents refused to complete the questionnaire because of apprehensions of living donation. Of those who responded, 77% ($n = 50$) were in favor, 5% ($n = 3$) against and the remaining 18% ($n = 12$) undecided. If we adjust these figures adding those who indicate a certain amount of apprehension towards living donation, the percentages in the rural setting are 29% in favor, 58% against and 13% undecided.

Statistical analysis

The data were stored on a database and analysed using the SPSS 11.0 statistical package (SPSS 11.0 Inc. Headquarters, 233 S. Wacker Drive, 11th floor, Chicago, IL, USA). The unanswered questions or those left blank were considered as lost variables and were excluded from the analysis. Descriptive statistical analysis was carried out on each of the variables and for the bivariate analysis we used Student's *t*-test and the chi-squared test complemented by an analysis of remainders. Fischer's exact test was applied when the contingency tables had cells with an expected frequency of <5. A logistic regression analysis was carried out in order to determine and evaluate multiple risks using the variables that were statistically significant in the bivariate analysis. Values of $P < 0.05$ were considered to be statistically significant.

Results

Attitude towards living kidney donation

The questionnaire completion rate was 83% (265 respondents out of the 320 selected). In 55 cases the questionnaire was not completed: 18 respondents refused to answer straightaway for a variety of reasons and the 37 remaining cases were invalid questionnaires because, although the respondent had responded, the question about the dependent variable had not been answered.

Regarding the matter of donating a kidney while alive, 83% ($n = 220$) were in favor, provided this is a related type of donation. Only 19% ($n = 51$) were in favor if donation is considered to be unrelated. Of the rest 16% ($n = 42$) stated that they would not donate a kidney while alive, and the remaining 1% ($n = 3$) were unsure. With respect to the evaluation of risk from living kidney donation, 28% ($n = 71$) believed that donation was very risky, 44% ($n = 113$) believed that there was some risk involved, 19% ($n = 49$) were unsure about the risk involved and the remaining 10% ($n = 25$) believed that there was hardly any risk involved at all.

With respect to monetary incentives, 17% ($n = 45$) reported that they would donate an organ, while alive, for money although the vast majority of these respondents stated that this would depend on the quantity of money offered. Only 19% ($n = 49$) would have to think about it, while most (64%; $n = 169$) stated that they would never donate an organ, while alive, for money.

As compared with the Spanish control group, we can see that attitude towards living kidney donation was similar between residents from East Europe and those from the Urban control group (83% vs. 89%; $P = 0.0534$). However, it was more favorable than that of the rural control group (83% vs. 29%; $P < 0.001$) as shown in Fig. 1.

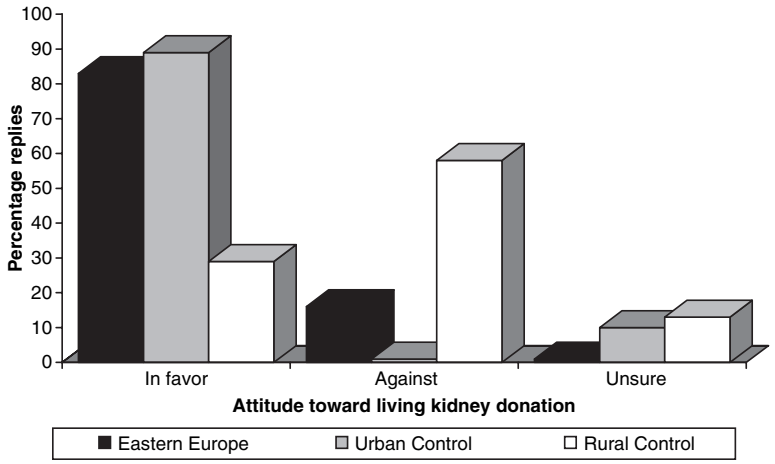

Figure 1 The attitude towards related living kidney donation among East Europeans in the study and the control group of Spanish respondents.

Bivariate analysis of the factors that determine attitude

In an analysis of the variables that influence attitude towards living kidney donation (Table 2) no relationship has been found between attitude and the following variables: age ($P = 0.716$); gender ($P = 0.616$); having descendents ($P = 0.713$); and level of education ($P = 0.523$). Regarding marital status, there was a more favorable attitude among those respondents who were married or separated, than among those who were still single (87% and 89% vs. 78%; $P < 0.001$).

Significant differences have been found according to the respondent's country of origin ($P = 0.014$). For example, those from Poland were mostly in favor, all 37 respondents from this country had a favorable attitude and the least favorable were the Romanians of whom only 77% were in favor.

A close relationship has also been found between attitude towards deceased donation and attitude towards living donation. Thus, 89% of those who were in favor of deceased donation would donate a kidney while alive as compared with 66% among those who were not in favor ($P < 0.001$). However, no association has been found between attitude and having had previous experience of the organ donation and transplantation process (knowing a family member or friend who has been a donor or a recipient of a transplant) ($P = 0.057$). However these differences were on the borderline of statistical significance and there is a less favorable attitude among those who have had this experience (92% vs. 81%).

Another factor that is positively associated with attitude towards living donation is participation in or a willingness to participate in voluntary type social help activities (96% and 87% respectively vs. 72% among those who would not like to participate; $P = 0.001$).

With regard to variables about social interaction, it has been found that those who have discussed the subject of organ donation within the family have a more favorable attitude than those who have not (94% vs. 77%; $P < 0.001$).

A respondent's religion is also associated with attitude towards living kidney donation. Thus, those who state that they were Catholic have a more favorable attitude (91%) than those who state they were atheists-agnostics (77%) or Orthodox (74%) ($P = 0.003$). Among those who state that they have a religion, no association has been found between knowing that one's religion is in favor of organ donation and transplantation and a more or less positive attitude towards living kidney donation.

Finally, there is a more positive attitude when a respondent believes that he or she might need a future transplant. In this case, 97% were in favor ($P = 0.002$). A respondent's concern about possible 'mutilation' after donation also influences attitude: those who were not worried about this have a more favorable attitude (93% vs. 77%; $P < 0.001$).

Multivariate analysis

After carrying out a multivariate analysis to evaluate the variables that most affect attitude towards related living kidney donation we have found that the following variables were related to attitude: 1) attitude towards deceased organ donation, especially when this attitude is negative, which reduces by more than six times the possibility of being in favor of living kidney donation (OR = 0.164); 2) participation in voluntary type social help activities, which multiplies by more than 25 the possibility of being in favor of living kidney donation (OR = 25.456); 3) having discussed the subject of organ donation and transplantation within the family, which increases by seven times the possibility of being in favor (OR = 7.042); 4) concern about possible mutilation as a consequence of donation. When this concern does not exist the possibility of being in favor increases sevenfold (OR = 7.494); and 5) a belief on the part of the respon-

Table 2. Variables that affect the attitude of East Europeans resident in the South East of Spain towards related living kidney donation.

Variable	Favorable attitude (*n* = 220; 83%)	Unfavorable attitude (*n* = 45; 17%)	*P*
Socio-personal variables			
Mean age: 37 ± 11 years	37 ± 11	38 ± 10	0.716
Gender			
Male (*n* = 109)	92 (42%)	17 (38%)	0.616
Female (*n* = 156)	128 (58%)	28 (62%)	
Marital status			
Single (*n* = 58)	45 (21%)	13 (29%)	**<0.001**
Separated/divorced (*n* = 26)	23 (11%)	3 (7%)	
Married (*n* = 172)	150 (68%)	22 (49%)	
Widowed (*n* = 9)	2 (1%)	7 (16%)	
Descendents			
Yes (*n* = 175)	146 (67%)	29 (64%)	0.713
No (*n* = 87)	71 (33%)	16 (36%)	
DK/NA (*n* = 3)	3	0	
Level of education			
No formal education (*n* = 32)	24 (13%)	8 (20%)	0.523
Primary (*n* = 20)	17 (9%)	3 (8%)	
Secondary (*n* = 67)	58 (32%)	9 (23%)	
University (*n* = 104)	84 (46%)	20 (50%)	
DK/NA (*n* = 42)	37	5	
Country of origin			
Bulgaria (*n* = 19)	16 (7%)	3 (7%)	**0.014**
Romania (*n* = 79)	61 (28%)	18 (40%)	
Ukraine (*n* = 92)	72 (33%)	20 (44%)	
Poland (*n* = 37)	37 (17%)	0 (0%)	
Russia (*n* = 22)	18 (8%)	4 (9%)	
Other Countries (*n* = 16)	16 (7%)	0 (0%)	
Variables of knowledge about ODT			
Previous experience of ODT			
No (*n* = 213)	172 (79%)	41 (91%)	0.057
Yes (*n* = 50)	46 (21%)	5 (11%)	
DK/NA (*n* = 2)	2	0	
Attitude towards deceased organ donation			
In favor (*n* = 139)	124 (56%)	15 (33%)	**<0.001**
Against (*n* = 61)	40 (18%)	21 (47%)	
Unsure (*n* = 65)	56 (26%)	9 (20%)	
A belief that one might need a Tx			
Yes (*n* = 63)	61 (28%)	2 (4%)	**0.002**
No (*n* = 32)	23 (11%)	9 (20%)	
Unsure (*n* = 170)	170 (62%)	34 (76%)	
Variables of social interaction			
Knowledge of a partner's attitude			
Yes, favorable (*n* = 66)	59 (28%)	7 (20%)	0.553
Not known (*n* = 141)	118 (58%)	23 (66%)	
Yes, against (*n* = 33)	28 (14%)	5 (14%)	
DK/NA (*n* = 25)†	15	10	
Family discussion about ODT			
No (*n* = 175)	135 (62%)	40 (89%)	**<0.001**
Yes (*n* = 88)	83 (38%)	5 (11%)	
DK/NA (*n* = 2)	2	0	
Variables of pro-social activity			
Participation in pro-social activity (voluntary)			
Yes (*n* = 47)	45 (21%)	2 (5%)	**0.001**
No nor will I (*n* = 67)	48 (22%)	19 (49%)	
No but I would like to (*n* = 141)	123 (57%)	18 (46%)	
DK/NA (*n* = 10)	4	6	

Table 2. continued

Variable	Favorable attitude (*n* = 220; 83%)	Unfavorable attitude (*n* = 45; 17%)	*P*
Variables of Religion			
Religious attitude			
Catholic (*n* = 111)	101 (47%)	10 (22%)	**0.003**
Atheist – agnostic (*n* = 22)	17 (8%)	5 (11%)	
Orthodox (*n* = 115)	85 (40%)	30 (67%)	
Another religion (*n* = 10)	10 (5%)	0 (0%)	
DK/NA (*n* = 7)	7	0	
Knowing the attitude of one's religion to ODT*			
Yes, in favor (*n* = 50)	326 (32%)	20 (17%)	**0.002**
Yes, against (*n* = 34)	8 (1%)	3 (3%)	
Not known (*n* = 149)	702 (68%)	92 (80%)	
DK/NA (*n* = 3)	7	2	
Variables of Attitude towards living donation			
Concern about mutilation after donation			
Concern (*n* = 60)	46 (22%)	14 (35%)	**<0.001**
No Concern (*n* = 125)	116 (56%)	9 (23%)	
Doubts (*n* = 62)	45 (22%)	17 (43%)	
DK/NA (*n* = 18)	13	5	

Significant values are given in bold.
*For this cross atheists and agnostics were excluded because they do not have a religion.
†These 25 cases are respondents who did not have a partner and therefore did not answer the question. All those with a partner answered this question.
ODT, organ donation and transplantation; TX, transplantation; DK/NA, does not know/no answer.

Table 3. Variables that affect attitude towards related living kidney donation. Logistic Regression Multivariate Analysis.

Variable	Regression coefficient (β)	Standard error	Odds ratio (confidence intervals)	*P*
Attitude towards deceased donation				
Unsure (*n* = 65)			1	
In favor (*n* = 139)	1.413	0.751	4.110 (0.943–17.905)	0.06
Against (*n* = 61)	–1.808	0.731	0.164 (0.039–0.687)	**0.013**
Participation in pro-social activities				
No but I would like to (*n* = 141)			1	
Yes (*n* = 47)	3.237	1.408	25.456 (1.611–402.176)	**0.022**
No nor will I (*n* = 67)	0.366	0.595	1.442 (0.449–4.629)	0.539
Family discussion about ODT				
No (*n* = 175)			1	
Yes (*n* = 88)	1.951	0.898	7.042 (1.212–40.866)	**0.03**
Concern about mutilation after donation				
Doubts (*n* = 62)			1	
Concern (*n* = 60)	–0.224	0.579	0.800 (0.257–2.489)	0.699
No Concern (*n* = 125)	2.014	0.775	7.494 (1.641–34.222)	**0.009**
A belief that one might need a Tx				
Doubts (*n* = 170)			1	
Yes (*n* = 63)	0.895	0.867	2.446 (0.447–13.382)	0.302
No (*n* = 32)	–2.287	0.87	0.102 (0.018–0.559)	**0.009**

Significant values are given in bold.

dent that he or she might need a future transplant. In this respect when a respondent believes that he or she has no chance of needing a transplant, the possibility of being in favor of this type of living donation is nearly 10 times less than among the rest (OR = 0.102). The complete multivariate study is presented in Table 3.

Discussion

In the vast majority of East European countries, although there were transplant programs, organ donation rates were generally low, both in deceased and in living donation [14]. What is more, although there were not many

studies about attitude towards organ donation in these countries, those that do exist usually suggest first a lack of awareness about the subject of organ donation and second, the need for an active educational campaign about this matter [19], and the need for an improvement in the donation process coordination system [20].

In Spain, the great development in deceased donation has slowed down the development in living donation. However, living transplantation has been considered as a necessity given that (a) it is ethically acceptable; (b) there is a low level of surgical risk in individual healthy donors; (c) the limited number of organs available; and (d) results were better as compared with those of deceased donation, in spite of the potential risks that living transplant activity causes for the donor [20–23]. However, despite institutional support for living donation in Spain and the favorable attitude of the many social and health care groups [7,8,15,24–27], this type of donation is still minimal [2,14]. The main barrier seems to be found among Spanish recipients, who were used to hearing about the high levels of deceased donation and who were therefore reluctant to receive a living donated organ from a family member because they believe that it is a type of 'mutilation', and they would be able to receive an organ from a deceased donor [9,10].

This situation means that we are obliged to look for emerging population groups in our society and to assess their level of acceptance of living kidney donation. East European citizens were a group of the population that has quite a favorable attitude towards living kidney donation, similar to the attitude of the Spanish population in urban areas. Therefore, they could be a group willing to participate in living kidney donation, if we take into account that we should not find the same problem among the potential recipients of donors from these nationalities that there is among native Spanish recipients [9,10]. In this respect it would be an interesting complement to this study to evaluate the attitude of patients of these nationalities on the transplant waiting list towards related living donation. It should be remembered that in the study presented here there are data that suggest that we are dealing with a population that is not very aware about the subject of organ donation and transplantation. We can see this in their attitude towards deceased organ donation, which is slightly less favorable than that of the Spanish population. In addition, they have had little contact with the donation and transplantation process so that less than 20% of respondents know or have known a transplant patient or donor. This is the great difference with respect to Spanish society and implies little contact with the process and consequently little awareness of the matter. Therefore, given the importance of this growing population group in our society, we should focus our public awareness campaigns on them. They are similar to our native population more than 20 years ago when the population was first made aware of the matter in Spain. In some ways, it is like going back in time and we should do the job well to prevent a reduction in organ donation and transplantation in our country. The organ donation statistics show that the countries with a high rate of organ donation have a small number of living donations.

However, as observed in our study, living donation is successful where it is a related type of donation, where affective and emotional factors are fundamental. On the other hand, factors such as monetary incentives are not so important and could cause rejection [28]. Thus, only 17% would donate for money. In our study, it has been seen that attitude is more favorable among those respondents with a family, especially those who are married, and therefore those who are more sensitive about donating to a family member. What is more, attitude is much more positive among those who have discussed the subject within the family. However, as we mentioned earlier, they are not very aware of the subject and only 34% of respondents have discussed the matter within the family. In fact, discussing the subject within the family is an independent factor that encourages a favorable attitude (OR = 7.042), which is why it is important to discuss the subject of organ donation within the family, a fundamental way of promoting deceased donation and as we can see it is also important in living donation [5,16].

An analysis of factors that determine attitude towards living kidney donation shows that there is a close relationship with attitude towards deceased donation, a factor that has also been described in the Spanish population as a positive factor for attitude [7,15]. Thus, among those who are not in favor of deceased donation there is a very unfavorable attitude towards living kidney donation, with an Odds Ratio of 0.164. This piece of data supports the fact that the organ donation and transplantation process is a global process and one in which the promotion of deceased donation is going to produce greater awareness about living donation. Therefore, an indirect way of promoting living donation in the public is to promote deceased donation and transplantation in general.

Another important factor is the lack of awareness about the subject. For example, it has been seen that apprehensions of mutilation or of being left with scars after donation is a factor that encourages a negative attitude towards living donation. In this respect, we should highlight that currently in most extraction centers, a transplant is performed via laparoscopy causing minimal scars and there is often early discharge. This should reduce such concern [17], given that the aesthetic and physiologic repercussions are minimal using this type of organ procurement system [29].

It is also worth noting that a respondent's religious activity also affects attitude and also possibly leads to differences in attitude according to a respondent's nationality. Thus, there is a more favorable attitude among those respondents from countries where the most common religion is Catholicism. This is important when carrying out the promotion of living donation activities. What is more, taking advantage of the fact that contact is currently being made with religious authorities in order to promote deceased donation, it would be an effective promotion option. This promotion activity is regularly carried out in Spain with the Catholic Church; however, to improve the attitude in this population group with less awareness we should influence other religions, especially the Orthodox religion. This would be an important way to directly promote donation at a low cost in this population group. In fact, Orthodox groups are easy to locate in Spain and their leaders are in favor of organ donation and transplantation and therefore the promotion activity would be positive.

We would like to state that there are also factors of reciprocity that influence attitude. For example, there is a more positive attitude among those who believe they might need a transplant in the future. Accordingly, a belief that one is not going to need an organ in the future is an independent factor that makes the possibility of being in favor of donating a kidney decrease by ten times (OR = 0.102).

Finally, the type of study we have presented here represents the attitude of a population group at a specific point in time. Any changes, especially in information, can influence changes in this attitude. What is more, although attitude and opinion are not quite the same, this study determines attitude using an opinion questionnaire [30]. These studies are carried out in this way because attitude is understood to mean the willingness to respond in an evaluative way (emotional, cognitive or behavioral) when presented with a certain object and that this can expressed through language as a certain opinion towards a matter. Consequently we believe as other authors [30], that opinions and attitudes are variables that interact with each other. Therefore, one of the most important elements in a change of attitude, in this case social, is the prior change of opinion.

To conclude we could say that attitude towards living kidney donation among East Europeans who are living in the South East of Spain is favorable provided that it is related, and is very closely associated with attitude towards deceased donation, family attitude and feelings of reciprocity. The patients on the waiting list of these nationalities could be an appropriate subgroup in which we might encourage living kidney donation, although specific studies would be needed among recipients in order to confirm this.

Authorship

AR, PR and PP: conception and design. AR, LM-A, JS, DG and NJ: acquisition of a substantial portion of data. AR, LM-A, PR and PP: analysis and interpretation of data. AR and LM-A: drafting of the manuscript. PP: critical revision of the manuscript for important intellectual content. AR: statistical expertise. AR, PP and PR: obtaining funding for this project or study. AR, PP and PR: supervision. AR, PP, PR and LM-A: final approval of the version to be published.

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ANNEX I: Questionnaire about organ donation and transplantation

No.	Question	Options
1	Age	
2	Gender	1.-Man; 2.-Woman
3	Marital Status	1.-Single; 2.-Married; 3.-Separated/Divorced; 4.-Widowed
4	Original country and location	
5	Qualifications/Education	
6	Profession	
7	Do you have any children?	1.-Yes; 2.-No
8	Would you donate you organs upon death?	1.-Yes; 2.-No; 3.-Not sure
9	If you are in favor of donation, what are your reasons? (Choose as many responses as you wish)	1.-For solidarity; 2.-For cultural reasons; 3.-In order to survive after my own death; 4.-To avoid the useless destruction of my organs; 5.-Because you think that you may also need organs from other donors; 6.-Because you believe it is a moral duty; 7.-Others:
10	If you are not in favor of donation, what are your reasons? (Choose as many responses as you wish)	1.-Because the dead should be left in peace; 2.-Becasue of religious reasons; 3.-Because the idea of mutilating the body is displeasing; 4.-Because of apprehensions of a death that is only apparent; 5.-Others:
11	If you had to decide, would you donate the organs of a family member?	1.-Yes; 2.-No; 3.-Not sure

No.	Question	Options
12	Do you collaborate in any voluntary or social help activity?	1.-Yes; 2.-No, nor will I ever collaborate; 3.-No, but I would like to
13	Have you discussed the matter of organ donation and transplantation with your family?	1.-Yes; 2.-No
14	Is there any possibility that a person with brain death might recover and live?	1.-Yes; 2.-No; 3.-I don't know
15	When you die, would you accept cremation of your body?	1.-Yes; 2.-No
16	When you die, would you accept burial of your body?	1.-Yes; 2.-No
17	When you die, would you accept that an autopsy be carried out on your body if it were necessary?	1.-Yes; 2.-No
18	Do you know of anyone among your family members and friends who has needed or received an organ transplant?	1.-Yes; 2.-No
19	If you donated your organs, would you be concerned that your body might be left with scars or might be mutilated after organ extraction?	1.-Yes, it concerns me; 2.-I do not mind; 3.-I am not sure
20	What is your religion?	1.-Catholic; 2.-Atheist-agnostic; 3.-Orthodox; 4.Another religion; 5.-I do not have a religion
21	Do you know the attitude of your religion towards organ donation?	1.-Yes, it is in favor of donation; 2.-Yes, it is against donation; 3.-I do not know it
22	Do you know the opinion of your partner towards organ donation?	1.-Yes, he or she is in favor; 2.-I do not know his or her opinion; 3.-Yes, he or she is against; 4.-I do not have a partner
23	Do you believe that you might ever need an organ transplant?	1.-Yes; 2.-No; 3.-Not sure

