ORIGINAL ARTICLE

The attitude of Latin American immigrants in Florida (USA) towards deceased organ donation – a cross section cohort study

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SUMMARY

The Latin American (LA) population resident in the USA is a growing subgroup of the population. To find out the structure of attitude towards organ donation in the LA population resident in Florida (USA). A sample was taken of LA residents in Florida, randomized and stratified by nationality, age and sex ($n = 1524$). Attitude was assessed using a validated questionnaire (PCID–DTO Rios) that was self-completed anonymously. The survey completion rate was 95% ($n = 1450$). Attitude was favourable in 33% of respondents ($n = 485$), against in 40% ($n = 575$) and undecided in 27% ($n = 390$). The following variables were associated with a favourable attitude: country of origin (Dominican Republic; $P = 0.038$); sex (female; $P < 0.001$); marital status (married; $P < 0.001$); level of education (university; $P < 0.001$); previous experience of the subject ($P < 0.001$); considering the need for a transplant in the future ($P < 0.001$); understanding the concept of brain death ($P = 0.003$); attitude towards donating a family member's organs ($P < 0.001$); having discussed organ donation and transplantation with one's family ($P < 0.001$) or with one's partner ($P < 0.001$); participation in pro-social type activities ($P < 0.001$); the respondent's religion (atheist–agnostic; $P < 0.001$); a respondent's knowledge of the attitude of his or her religion towards organ donation ($P < 0.001$); no concern about mutilation after donation ($P < 0.001$); acceptance of cremation ($P < 0.001$); burial ($P < 0.001$); and an autopsy if one were needed ($P < 0.001$). The attitude towards donation of LA in Florida is worse than that reported in the native population and is associated with certain psychosocial factors.

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Key words
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Introduction

Organ transplantation is a fully accepted therapy, which is mainly limited by the shortage of organs available for carrying it out [1]. In order to increase the supply of transplant organs, it is necessary to take action in different ways, both within organizations and in society [2–6]. Currently, immigration is a common and growing phenomenon in western Europe and the USA, given the level of economic development in these places. This fact is having repercussions for the world of transplantation given that most Western countries are experiencing a considerable increase in the number of non-national patients on the transplant waiting list, and requests for organs from non-native families are being considered [1,4,7].

Thus, we can see that in the year 2010, there were 50.5 million Latin American (LA) people included in the censuses of the USA, although sources other than the census estimate this number to be higher. For instance, the Pew Hispanic Center estimated that in the year 2005, there were more than 10 million LA immigrants who were not legally registered in the USA and who were working there illegally; positioning the USA as the country with the second highest LA population in the world, after Mexico with 107.5 million inhabitants. Of the total population of Latin Americans, it should be noted that according to the US Demographic Resource Center, a large proportion of this population is located in the south and west of America. There are five states that have LA populations of more than one million inhabitants: New York, Florida, Illinois, Arizona and New Jersey.

In the state of Florida in the census carried out in the year 2010, it was seen that 22% of the inhabitants who were resident in Florida were of LA origin. This figure represents a growth of 57.4% over the 10 year period from the year 2000 until 2010. This figure includes all the Latin Americans in a legal situation. Added to this figure, we should include the population in an illegal situation or without a residence permit.

The notable increase in foreign population is leading to a new social and demographic reality in several countries. It has been reported that in the LA immigrant population, specifically in the USA, there is a low organ donation rate, lower than in the non-Hispanic white population [8]. Therefore, it is important to analyse their attitude towards organ donation and transplantation to determine their willingness to donate their organs [3–5,7].

The objectives of this study were (i) to find out the structure of the attitude of the population over 15 years of age in the state of Florida towards the donation of their own solid organs; (ii) to analyse the psychosocial variables of this population and what influences them; and (iii) to define favourable and unfavourable psychosocial profiles towards organ donation.

Methods

Study population

The population ≥15 years resident in the state of Florida in the USA. To find out the population with these characteristics, we took as a reference the population recorded in the last census of inhabitants in the state of Florida in the year 2010, where there is a record of the percentage of legal population born in LA countries and resident in Florida. In this census, the LA population living permanently and legally in Miami consisted of 3 970 375 people (http://www.census.gov/). In addition, a percentage of the population of these nationalities is not legal, and to obtain an estimation of its size, several immigration charities were consulted, which anonymously indicated that approximately 1 363 798 more citizens without documentation could be living in the state of Florida.

Sample size

From the population (n = 5 334 173), a sample of n = 1524 was drawn to ensure that the width of a 95% confidence interval for the proportion with favourable attitude did not exceed six percentage points, assuming that 50% of respondents had a favourable attitude.

Sample selection

A random representative sample was obtained stratified according to the respondent's nationality, sex and age.

The sample was obtained according to the legal situation of the population:

1 Population with legal documentation: The population census of the USA provides the number of people of every nationality living in Florida, giving age, sex and municipality of residence (http://www.census.gov/). The sample was stratified by age and sex for each nationality according to the data in this census (Table 1).
2 Population without legal documentation: Information about this group is not as accurate as it is in the previous one, as there is no official information. Different immigration charities were consulted to estimate its size. Given the characteristics of this

Table 1. Distribution of the respondents according to nationality, age and sex.

	Men								Women									
	15–25 years		26–45 years		46–65 years		>65 years		15–25 years		26–45 years		46–65 years		>65 years		Total	
	N0	N1	N0	N1	N0	N1	N0	N1	N0	N1	N0	N1	N0	N1	N0	N1	N0	N1
North America																	303	297
Mexico	65	**60**	80	**80**	8	**8**	3	**1**	65	**64**	70	**69**	8	**8**	4	**2**	303	297
Central America																	994	947
Cuba	68	**67**	120	**119**	54	**54**	10	**6**	60	**58**	65	**63**	55	**55**	16	**16**	448	438
Puerto Rico	21	**20**	68	**66**	47	**46**	8	**2**	20	**20**	55	**55**	40	**40**	10	**10**	269	259
Nicaragua	20	**20**	30	**30**	15	**15**	4	**4**	8	**8**	6	**6**	4	**4**	2	**2**	89	89
Dominican Rep.	15	**12**	20	**15**	5	**1**	2	**0**	12	**12**	15	**15**	8	**8**	3	**3**	80	66
Honduras	5	**4**	10	**10**	5	**5**	1	**0**	4	**3**	8	**7**	5	**5**	2	**1**	40	35
Guatemala	5	**4**	4	**4**	4	**3**	1	**0**	4	**4**	4	**3**	4	**3**	3	**2**	29	23
El Salvador	3	**2**	4	**4**	3	**3**	1	**1**	1	**1**	5	**5**	2	**2**	1	**1**	20	19
Costa Rica	–	–	2	**2**	2	**2**	–	–	1	**1**	1	**1**	2	**2**	1	**0**	9	8
Panama	1	**1**	2	**2**	2	**2**	–	–	1	**1**	2	**2**	1	**1**	–	–	9	9
Other countries	–	–	–	–	1	**1**	–	–	–	–	–	–	–	–	–	–	1	1
South America																	227	206
Colombia	8	**8**	25	**25**	30	**30**	2	**2**	6	**6**	15	**12**	11	**11**	3	**3**	100	97
Venezuela	5	**5**	10	**10**	5	**5**	1	**1**	3	**1**	3	**1**	8	**7**	3	**3**	38	35
Peru	4	**4**	8	**8**	4	**4**	1	**1**	3	**2**	4	**3**	3	**1**	3	**0**	30	23
Ecuador	5	**5**	6	**6**	2	**2**	1	**1**	3	**2**	2	**2**	1	**0**	1	**1**	21	19
Argentina	2	**2**	5	**5**	3	**3**	1	**1**	1	**1**	4	**3**	1	**1**	2	**1**	19	17
Chile	1	**1**	1	**1**	2	**2**	–	–	1	**1**	1	**1**	1	**1**	–	–	7	7
Uruguay	–	–	1	**1**	1	**1**	–	–	–	–	1	**1**	1	**1**	1	**0**	5	4
Bolivia	–	–	1	**1**	1	**1**	–	–	–	–	1	**0**	2	**2**	–	–	5	4
Paraguay	–	–	1	**0**	–	–	–	–	–	–	–	–	–	–	–	–	1	0
Other countries	–	–	–	–	–	–	–	–	–	–	1	0	–	–	–	–	1	0
Total																	1524	1450

N0, Estimated Number of Respondents; N1, Number of respondents obtained.

population, a confidentiality of information form was drafted and given to the charities. With this information, an approximate population census was estimated with information on age, gender and municipality of residence. The sample was stratified by age and sex for each nationality according to this approximate data (Table 1).

Opinion survey

The instrument used to measure opinion was a questionnaire of attitude towards organ donation and transplantation (PCID-DTO RIOS: A questionnaire of the 'Proyecto Colaborativo Internacional Donante' sobre donación y trasplante de órganos developed by Dr. Ríos) [4,6,7,9–11]. This questionnaire includes questions distributed into four subscales or factors validated in the Spanish population, presenting a total explained variance of 63.203% and an Alfa de Cronbach confidence coefficient of 0.834. Each factor had internal consistency, measured by Cronbach's Alfa confidence coefficient, of α: 0.957, α: 0.804, α: 0.745 and α: 0.641, respectively, and an explained variance of 26.287%, 24.972%, of 6.834% and 5.110%, respectively. This questionnaire was used as there is extensive experience of its use in the Spanish speaking field. A pilot study was carried out using a random sample, to confirm the validity of the questionnaire in this subset of the population (n = 200), where no problems were encountered.

Study variables

Attitude towards the donation of one's own solid organs after death was studied as the dependent variable. The independent variables were grouped into the following categories: (i) demographic variable; (ii) socio-personal variables; (iii) variables of knowledge related to donation and transplantation; (iv) variables of social interaction; (v) religious variables; and (vi) variables of attitude towards the body.

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Application of the survey

The questionnaire was self-completed anonymously. The whole process was supervised by collaborators from the 'International Donor Collaborative Project', who had been previously trained in the matter and carried out the study during the period from January until December 2010.

The training of the collaborators was based on acquiring basic skills for empathizing with the respondent, focused mainly on conveying the idea that it was a totally anonymous project with the objective of making improvements in health. Facilities were provided for completing the questionnaire which could be completed on any other day and time, and any confrontation, forcefulness or aggression was always avoided during the questionnaire completion process with the potential respondent.

In each of the population nuclei where the sampling was to be carried out, the support of the immigrant associations was necessary. The personal information about the participants was obtained in the population nuclei by the collaborators form the 'International Donor Collaborative Project' in collaboration with the immigrant associations. In each case, it was confirmed that the potential respondent met the criteria of stratification by nationality, age and sex. It was explained to the respondents that this was a totally anonymous opinion study where their name and address would not be recorded. The potential respondent gave their oral consent for the study. Members of the different associations were available to reduce any mistrust that the research team might have cause among the LA population. In cases where respondents indicated that they do not know how to read, project collaborators read the questions and they marked the options they considered appropriate. In no cases were incentives offered to respondents to participate in the project.

The study protocol was approved by the institute's committee (Proyecto Colaborativo Internacional Donante). The informed consent was oral and in the persons under 18 years the consent was given by their legal guardians.

Statistical analysis

The data were stored on a database and analysed. A descriptive statistical analysis was carried out, and to compare the different variables, Student's *t*-test and the chi-square test were applied complemented by an analysis of the remainders. To determine and assess the multiple risks, a binary logistic regression analysis following the forward method (LR) was performed using all variables.

Results

Completion rate

The questionnaire completion rate was 95% (1450 surveyed of the 1524 selected) (Table 1).

Attitude towards deceased organ donation

The attitude towards the donation of the respondent's own solid organs was favourable in 33% of those surveyed ($n = 485$) (Table 2). The main reasons given for having this favourable attitude were 'reciprocity', that is, doing to others what you would like to be done to yourself (63%; $n = 307$); 'solidarity' (47%; $n = 230$); and as a 'moral duty for your neighbour' (23%; $n = 113$).

Of the remaining respondents, attitude was unfavourable in 40% ($n = 575$) of cases and 27% ($n = 390$) were undecided. A large portion of them accounted for their attitude by stating 'a belief in leaving the dead in peace' (57%; $n = 552$); 'being afraid of the possible mutilation of the body after donation' (27%; $n = 262$); or 'religious reasons' (25%; $n = 244$).

A bivariate analysis of the factors affecting attitude

Demographic variable

To compare the countries, given their low number and diverse nature as can be seen in Table 2, only those that had at least 20 respondents were selected so that the statistical result was useful. Differences were found in attitude according to the respondent's country of origin ($P = 0.038$) (Table 3). For instance, those most in favour were the Dominicans (45%) and the Venezuelans (43%), and those least in favour were the Cubans (27%) and the Nicaraguans (22%) (Table 3).

Socio-personal variables

Attitude was more favourable among females than among the males (39% vs. 29%; $P < 0.001$). Differences were also observed depending on marital status, with married respondents being more in favour than those who did not have a partner (separated, divorced, or widowed) (39% vs. 15%; $P < 0.001$). Finally, differences were found according to the respondent's level of formal education. For instance, 93% of those who had undertaken university studies were in favour, compared to 14% of those without a formal education ($P < 0.001$) (Table 3).

Table 2. Distribution of the respondents according to nationality and attitude towards organ donation.

Country	Legal residents	Estimated residents*	Estimated sample	Sample obtained	Attitude in favour	Attitude against	Undecided attitude
North America	629 718	1 129 718	303	297			
Mexico	**629 718**	**1 129 718**	303	297	97 (33%)	126 (42%)	74 (25%)
Central America	2 666 114	3 433 912	994	947			
Cuba	**1 213 438**	**1 542 438**	448	438	120 (28%)	218 (50%)	100 (22%)
Puerto Rico	**847 550**	**945 550**	269	259	95 (37%)	93 (36%)	71 (27%)
Nicaragua	**135 143**	**305 143**	89	89	20 (23%)	36 (40%)	33 (37%)
Dominican Republic	**172 451**	**275 451**	80	66	30 (46%)	22 (33%)	14 (21%)
Honduras	**107 302**	**137 302**	40	35	14 (40%)	10 (29%)	11 (31%)
Guatemala	**83 882**	**98 882**	29	23	9 (39%)	8 (35%)	6 (26%)
El Salvador	**55 144**	**67 144**	20	19	9 (47%)	4 (21%)	6 (32%)
Costa Rica	**20 761**	**29 761**	9	8	4 (50%)	0	4 (50%)
Panama	**28 741**	**29 741**	9	9	5 (56%)	0	4 (44%)
Other countries	**1692**	**2500**	1		1 (100%)	0	0
South America	674 543	770 543	227	206			
Colombia	**300 414**	**341 414**	100	97	38 (39%)	18 (19%)	41 (42%)
Venezuela	**102 116**	**122 116**	38	35	15 (43%)	6 (17%)	14 (40%)
Peru	**100 965**	**102 965**	30	23	7 (30%)	6 (26%)	10 (44%)
Ecuador	**60 574**	**72 574**	21	19	7 (37%)	12 (63%)	0
Argentina	**56 260**	**67 260**	19	17	7 (41%)	10 (59%)	0
Chile	**23 549**	**25 549**	7	7	3 (43%)	2 (29%)	2 (29%)
Uruguay	**14 542**	**16 542**	5	4	2 (50%)	2 (50%)	0
Bolivia	**10 938**	**14 938**	5	4	2 (50%)	2 (50%)	0
Paraguay	**2222**	**3222**	1	0	0	0	0
Other countries	**2963**	**3963**	1	0	0	0	0
Total	3 970 375	5 334 173	1524	1450	485 (33%)	575 (40%)	390 (27%)

*Total of legal residents and those estimated to be illegal residents using information from immigration charities.

Variables of knowledge about organ donation

The respondents who had had previous experience of donation, through family members or friends, had a more favourable opinion than those who had not had this experience (91% vs. 30%; $P < 0.001$). However, only 5% of respondents had had this kind of experience.

In addition, a respondent's belief that he or she might need a transplant in the future was significantly associated with attitude towards donation (97% vs. 32%; $P < 0.001$).

An association has been observed between knowledge of the concept of brain death and attitude towards organ donation (40% vs. 27%; $P = 0.003$). It is notable that 22% of the respondents did not consider that brain death meant the death of an individual and a further 54% had doubts about the meaning of this concept (Table 4).

Variables of social interaction

The respondents who were in favour of the donation of a family member's organs were more in favour of the donation of their own organs ($P < 0.001$). In this sense, the respondents who had previously discussed the subject of organ donation and transplantation in their family circle had a more favourable attitude (89% vs. 28%; $P < 0.001$). Within the family, it is also important to take into account the attitude of the respondent's partner towards donation. In this regard, it has been seen that when their partner was in favour, 100% of the respondents were in favour, while when the partner's attitude was not known, this percentage decreased to 25% ($P < 0.001$) (Table 4).

Finally, those respondents who usually carried out pro-social voluntary and social charity type activities, or who were prepared to do so, had a more favourable attitude than those who had not or had no intention of doing so (48% vs. 32%; $P < 0.001$) (Table 4).

Variables of religion

Eighty six percentage of those surveyed were Catholics. However, the most favourable attitude was found among atheists/agnostics compared to Catholics and other religious doctrines (57% vs. 33% and 26%, respectively; $P < 0.001$).

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Table 3. Demographic and socio-personal variables about donation and transplantation and of social interaction affecting attitude towards donation.

Variable	Favourable attitude (n = 485; 33%)	Unfavourable attitude (n = 965; 67%)	P
Demographic variable			
Country of origin*			
Cuba (n = 438)	120 (27%) −2.2†	318 (73%) 1.6	**0.038**
Mexico (n = 297)	97 (33%) −0.2	200 (67%) 0.2	
Puerto Rico (n = 259)	95 (37%) 0.9	164 (63%) −0.6	
Colombia (n = 97)	38 (39%) 1.0	59 (61%) −0.7	
Nicaragua (n = 89)	20 (22%) −1.8	69 (78%) 1.3	
Dominican Republic (n = 66)	30 (45%) 1.7	36 (55%) −1.2	
Venezuela (n = 35)	15 (43%) 1.0	20 (57%) −0.7	
Honduras (n = 35)	14 (40%) 0.7	21 (60%) −0.5	
Peru (n = 23)	7 (30%) −0.2	16 (70%) 0.2	
Guatemala (n = 23)	9 (39%) 0.5	14 (61%) −0.3	
Socio-personal variables			
Mean age: 37 ± 14 years	36 ± 14	38 ± 15	0.130
Sex			
Male (n = 817)	240 (29%) 3.7	577 (71%) −3.7	**<0.001**
Female (n = 633)	245 (39%) −3.7	388 (61%) 3.7	
Marital status			
Single (n = 374)	102 (27%) −2.9	272 (73%) 2.9	**<0.001**
Separated/divorced/widowed (n = 241)	60 (25%) −3.1	181 (75%) 3.1	
Married (n = 835)	323 (39%) 4.9	512 (61%) −4.9	
Descendents			
Yes (n = 1018)	333 (33%)	685 (67%)	0.361
No (n = 432)	152 (35%)	280 (65%)	
Level of formal education			
No formal education (n = 355)	50 (14%) −8.9	305 (86%) 8.9	**<0.001**
Primary (n = 770)	208 (27%) −5.5	562 (73%) 5.5	
Secondary (n = 236)	144 (61%) 9.8	92 (39%) −9.8	
University (n = 89)	83 (93%) 12.3	6 (7%) −12.3	

*Countries with less than 20 respondents have been excluded (see Table 1).

†Standardized residuals.

Among the religious respondents, knowing that their Church was in favour of organ transplantation was associated with a more favourable attitude compared to when they did not know its view (92% vs. 30%; $P < 0.001$). Even so, only 6% knew that the attitude of their Church was favourable towards organ donation (Table 5).

Variables of attitude about the body

A close relationship has been observed between attitude towards the manipulation of the body and attitude towards organ donation. Fear of mutilation after donation or doubts about this situation led respondents to have a worse attitude towards donation ($P < 0.001$) (Table 5). In this regard, those who would accept cremation of the body after death were more in favour of donating their organs than those who would not accept cremation (75% vs. 29%; $P < 0.001$). Similarly, those who preferred options other than burial after death had a more favourable attitude (100% vs. 28%; $P < 0.001$). Finally, attitude was more favourable among those who would be willing for an autopsy to be carried out after death if it were necessary (71% vs. 26%; $P < 0.001$), as can be seen in Table 5.

A multivariable analysis of the factors affecting attitude

As shown in Table 6, the following independent variables were associated with attitude towards the donation of one's own organs in a multivariable model: (i) level of formal education (compared to people with no formal education, the interviewees with primary education had an odds ratio of 9.615, and those with secondary

Table 4. Variables of knowledge, of social interaction and pro-social behaviour, affecting attitude towards donation.

Variable	Favourable attitude (n = 485; 33%)	Unfavourable attitude (n = 965; 67%)	P
Variables of knowledge about donation and transplantation			
Previous experience of donation and transplantation			
No (n = 1376)	418 (30%) −10.7*	958 (70%) 10.7	**<0.001**
Yes (n = 74)	67 (91%) 10.7	7 (9%) −10.7	
A belief that one might need a transplant			
Yes (n = 31)	30 (97%) 7.6	1 (3%) −7.6	**<0.001**
No/doubts (n = 1419)	455 (32%) −7.6	964 (68%) 7.6	
Knowledge of the concept of brain death			
Wrong concept (n = 323)	88 (27%) −2.7	235 (73%) 2.7	**0.003**
Concept known (n = 350)	139 (40%) 2.9	211 (60%) −2.9	
Concept not known (n = 777)	258 (33%) −0.2	519 (67%) 0.2	
Variables of social interaction			
Attitude towards the donation of a family member's organs			
Yes (n = 242)	154 (64%) 10.9	88 (36%) −10.9	**<0.001**
No (n = 606)	94 (15%) −12.3	512 (85%) 12.3	
Doubts (n = 602)	237 (39%) 4.0	365 (61%) −4.0	
Family discussion about donation and transplantation			
No (n = 1326)	375 (28%) −13.6	951 (72%) 13.6	**<0.001**
Yes (n = 124)	110 (89%) 13.6	14 (11%) −13.6	
One's partner's opinion about donation and transplantation:			
Yes, favourable (n = 169)	169 (100%) 19.5	0 (0%) −19.5	**<0.001**
I do not know it (n = 962)	236 (25%) −10.1	726 (75%) 10.1	
Yes, against (n = 10)	0 (0%) −2.2	10 (100%) 2.2	
I do not have a partner (n = 309)	80 (26%) −3.2	229 (74%) 3.2	
Carrying out pro-social activities			
Yes (n = 356)	170 (48%) 6.6	186 (52%) −6.6	**<0.001**
I will not take part in them (n = 579)	188 (32%) −0.6	391 (68%) 0.6	
No, but I would like to (n = 515)	127 (25%) −5.3	388 (75%) 5.3	

*Standardized residuals.

and university education had a ratio of 76.923 and 5.235, respectively); (ii) previous experience of donation and transplantation (the interviewees with previous experience had an odds ratio of 500 compared to interviewees without previous experience); (iii) attitude towards the donation of a family member's organs (compared to people with a negative attitude towards the donation of a family member's organs, the interviewees with a positive attitude had an odds ratio of 2.298 and the interviewees with doubts had a ratio of 2.212); (iv) a respondent's religion (Catholics had an odds ratio of 3.460 compared to the interviewees with another religion or without a religion); (v) concern about mutilation after donation (compared to the people with doubts over their concern about mutilation after donation, the interviewees without concern about mutilation after donation had an odds ratio of 90.909, and the interviewees who were concerned had a ratio of 4.694); (vi) acceptance of cremation (the people who would accept cremation after death had an odds ratio of 35.812 compared to the interviewees who would not accept cremation); and (vii) a willingness to accept an autopsy being carried out if one were needed (the interviewees that would accept an autopsy after death if it were necessary had an odds ratio of 17.241 compared to the interviewers that would not accept an autopsy).

Discussion

Latin America is an enormous region whose main characteristic is heterogeneity, whether in terms of ethnicity, development, resources, culture or the population. All the countries have at least one transplant programme and the current tendency of LA countries is to encourage organ donation and transplantation. As a result, there is close collaboration with the Spanish Organ Transplant Organization (ONT) with the aim of implementing the Spanish model in most of these countries [12]. Currently, Latin America has donation rates of less than 10 deceased donors per million of population (p.m.p)., with some exceptions, and this is due to two fundamental reasons. The first of these is the high rate

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Table 5. Variables of religion and attitude towards the body affecting attitude towards donation.

Variable	Favourable attitude (n = 485; 33%)	Unfavourable attitude (n = 965; 67%)	P
Religious variables			
A respondent's religion			
Catholic (n = 1241)	414 (33%) −0.2†	827 (67%) 0.2	**<0.001**
Atheist – Agnostic (n = 53)	30 (57%) 3.6	23 (43%) −3.6	
Another religion (n = 156)	41 (26%) −2.0	115 (74%) 2.0	
Knowledge of one's religion towards donation and transplantation*			
Yes, in favour (n = 86)	79 (92%) 12.1	7 (8%) −12.1	**<0.001**
Yes, against (n = 11)	0 (0%) −2.3	11 (100%) 2.3	
I do not know it (n = 1300)	376 (29%) −10.6	924 (71%) 10.6	
Variables of attitude towards the body			
Concern about mutilation after donation			
Concern (n = 264)	47 (18%) −6.0	217 (82%) 6.0	**<0.001**
No concern (n = 717)	384 (54%) 16.1	333 (46%) −16.1	
Doubts (n = 469)	54 (11%) −12.2	415 (89%) 12.2	
Acceptance of cremation			
No (n = 1299)	371 (29%) −11.6	928 (71%) 11.6	**<0.001**
Yes (n = 151)	114 (75%) 11.6	37 (25%) −11.6	
Acceptance of burial			
No (n = 105)	105 (100%) 15.0	0 (0%) −15.0	**<0.001**
Yes (n = 1345)	380 (28%) −15.0	965 (72%) 15.0	
Acceptance of autopsy if one were necessary			
No (n = 1211)	315 (26%) −13.5	896 (74%) 13.5	**<0.001**
Yes (n = 239)	170 (71%) 13.5	69 (29%) −13.5	

*For this cross section, only Catholics were used.

†Standardized residuals.

of family refusals, and the second is the failure to detect cases of brain death [12].

In their countries of origin, very few studies have been carried out to assess attitudes towards organ donation. In those that exist, attitude in favour of donation ranges between 50% and 80% [13–15]. Immigration of the LA population into both Spain and the USA is very large. In Spain, the current studies of the attitude of Latin Americans towards the donation of their own solid organs after death have shown they have a very favourable attitude. For instance, Lopez *et al.* [16], in a study carried out on 453 LA residents in Spain, observed that 73.6% of interviewees were in favour of donation. Ríos *et al.* [11] in a study carried out on the LA population resident in Spain, stratified by nationality, and with a total of 1314 respondents, found that 60% were in favour of donation. There is a considerable difference in attitude between the data for the LA population resident in Spain and those residents in the USA. Our data have shown that only 33% of the LA residents in Florida were in favour of donating their organs, compared to 60% of the LA residents in Spain in a study carried out using the same methodology and questionnaire. If both studies are compared (Table 7), it can be seen that these differences can be confirmed for all the nationalities from Latin America.

One of the greatest problems for being able to compare the results of psychosocial studies is the use of different and non-validated questionnaires, which could lead to a misinterpretation or incorrect generalization about the results. Furthermore, most of this confusion is due to the fact that most articles in our field of knowledge are reported in journals with a low impact, and these are usually short articles, where it is sometimes difficult to follow the methodology. Consequently, there are certain limitations involved in making comparisons with other studies carried out on the attitude of LA residents in the USA. Even so, it is true that the majority of studies indicate that Latin Americans in the USA do not donate very much [17] and are not very supportive of donation [18–22]. In this regard, McNamara *et al.* [23] in a study over the telephone on 566 LA people found a similar attitude to that reported in our study, with 31.2% in favour of organ donation. In a similar way, authors such as Frates *et al.* [18] have analysed the perceptions of the Hispanic population in California towards organ donation and have

Table 6. Variables affecting attitude towards deceased organ donation – a multivariate logistic regression analysis.

Variable	Regression coefficient (β)	Standard error	Odds ratio (confidence intervals)	*P*
Level of education				
No education (*n* = 355)			1	
Primary (*n* = 770)	2.264	0.450	9.615 (23.255–3.984)	**<0.001**
Secondary (*n* = 236)	4.355	0.619	76.923 (250–23.255)	**<0.001**
University (*n* = 89)	1.657	0.409	5.235 (11.627–2.347)	**<0.001**
Previous experience of donation and transplantation				
No (*n* = 1376)			1	
Yes (*n* = 74)	6.093	0.635	500 (1000–125)	**<0.001**
Attitude towards the donation of a family member's organs				
No (*n* = 606)			1	
Yes (*n* = 242)	0.833	0.308	2.298 (4.201–1.257)	**0.007**
Doubts (*n* = 602)	0.795	0.317	2.212 (4.115–1.190)	**0.012**
A respondent's religion				
Another religion (*n* = 156)			1	
Catholic (*n* = 1241)	1.243	0.538	3.460 (9.900–1.207)	**0.021**
Concern about mutilation after donation				
Doubts (*n* = 469)			1	
Concern (*n* = 264)	1.546	0.606	4.694 (15.384–1.430)	**0.011**
No concern (*n* = 717)	4.472	0.432	90.909 (200–37.037)	**<0.001**
Acceptance of cremation				
No (*n* = 1299)			1	
Yes (*n* = 151)	3.578	0.930	35.812 (5.788–221.560)	**<0.001**
Acceptance of autopsy if one were necessary				
No (*n* = 1211)			1	
Yes (*n* = 239)	2.847	0.452	17.241 (41.666–7.092)	**<0.001**

shown that there are many taboos involved in talking about this subject.

Nevertheless, not all the results of the studies coincide and authors such as Siegel *et al.* [24], have shown that there is a good attitude, in the case of both deceased and living donation. Pérez *et al.* [25] in a study of the donation patterns in the three largest cities in the USA found that blacks and Latinos had a similar family rejection rate to donation, which is higher than in the white population in each city. What is more, they also state that the rejection rate varied a lot from some cities to others and they put this down to nationality [25]. To cite an example, in Miami, they consider this to be determined by the fact that a high percentage of the Latin American population is of Cuban origin, while in other cities they have other nationalities of origin, especially Mexican. In our study, these differences in attitude were not influenced by this fact, and as shown in Table 7, these differences were not found in Spain either. However, it is clear that the respondent's country of origin has an influence on attitude. Although the LA population is united by strong socio-cultural, historical, linguistic and religious ties, within this uniformity there is also a certain amount of heterogeneity, and the donation rates vary according to the person's nationality in either their native country, the USA or in Spain [11,21–23,25].

It cannot be concluded that these considerable differences between the studies are real, and they might simply be influenced by the following reasons: (i) the questionnaires are different and not validated in most cases; (ii) the field work has been conducted in several different ways (over the telephone, etc.) and it is often not clear; (iii) the samples are not usually stratified and it is often not clear if they are representative of the LA population; and (iv) the completion rates are generally very low and therefore there may be bias in the sample selection [17–26]. These are the only reasons that could explain the discrepancies that exist in the literature.

Taking into account all of these limitations, it has definitely been seen that in their countries of origin the studies published show a favourable attitude. In Spain, the LA population has an attitude that is very similar to that of the native Spanish population, and the organ donation rates are similar to those of the Spanish rates [11]. However, in the USA, the attitude tends to be negative and the donation rates are very low [17–19]. The possible explanations for this would have to be sought in the solidarity of the respondents although other factors may play a role such as their

Table 7. Distribution of the respondents according to nationality and attitude towards organ donation – a comparative study between Spain [11] and Florida (USA).

	Florida			Spain		
Country	Estimated residents	Sample obtained	Attitude in favour	Estimated residents	Sample obtained	Attitude in favour
North America	1 129 718	297		96 390	84	
Mexico	**1 129 718**	297	97 (33%)	**96 390**	84	54 (64%)
Central America	3 433 912	947		149 503	126	
Cuba	**1 542 438**	438	120 (28%)	**71 234**	62	37 (60%)
Puerto Rico	**945 550**	259	95 (37%)	**1150**	2	1 (50%)
Nicaragua	**305 143**	89	20 (23%)	**143**	0	–
Dominican Republic	**275 451**	66	30 (46%)	**68 769**	57	36 (63%)
Honduras	**137 302**	35	14 (40%)	**1348**	1	1 (100%)
Guatemala	**98 882**	23	9 (39%)	**1521**	1	1 (100%)
El Salvador	**67 144**	19	9 (47%)	**1356**	1	1 (100%)
Costa Rica	**29 761**	8	4 (50%)	**1671**	1	1 (100%)
Panama	**29 741**	9	5 (56%)	**1633**	1	1 (100%)
Rest of countries	**2500**	1	1 (100%)	**678**	0	–
South America	770 543	206		1 157 300	1027	
Colombia	**341 414**	97	38 (39%)	**217 000**	178	124 (70%)
Venezuela	**122 116**	35	15 (43%)	**23 850**	22	9 (41%)
Peru	**102 965**	23	7 (30%)	**49 600**	39	20 (51%)
Ecuador	**72 574**	19	7 (37%)	**513 000**	461	271 (59%)
Argentina	**67 260**	17	7 (41%)	**62 900**	55	46 (84%)
Chile	**25 549**	7	3 (43%)	**23 650**	22	12 (54%)
Uruguay	**16 542**	4	2 (50%)	**19 500**	18	12 (67%)
Bolivia	**14 938**	4	2 (50%)	**213 000**	206	101 (49%)
Paraguay	**3222**	0	0	**1132**	0	0
Brazil	**1220**	0	0	**31 000**	24	16 (67%)
Rest of countries	**2743**	0	0	**2668**	0	0
Total	5 334 173	1450	485 (33%)	1 403 193	1237	745 (60%)

nonintegration, the language, and the American healthcare system that is very restrictive for them, among others [23,27,28]. As a consequence, in some countries, an individual could be a donor but not a recipient because of his or her inability to pay for the costs of a transplant in a private healthcare system.

An analysis of the psycho-social profile of respondents has shown that most of the factors reported in Western populations have arisen in the LA population who reside in Florida. Factors, such as previous experience of donation and/or transplantation, that is, the fact of knowing that a neighbour, friend or family member is a transplant patient, and taking part in pro-social activities or being in favour of doing them, are indicators of a favourable attitude towards donation [3,5]. It is clear that donation involves solidarity and is part of an altruistic vision of life, seen in participation in pro-social activities [3,4]. It is notable that there was a low level of awareness about the subject of donation and transplantation among the LA population, and proof of this is that only 5% had had previous experience of organ donation and transplantation. However, among those who had prior experience, the effect is very positive and they showed a very favourable attitude towards donation (Table 6). In this regard, some studies carried out in the USA [29–31] have shown that this factor could explain why in interventionist campaigns on the radio or television, if a Latin American is broadcast talking about the favourable experience he or she had after receiving an organ, then this could lead to an increase in favourable attitude in this LA group of the population.

The knowledge of the concept of brain death, a classic factor related to attitude towards donation, did not persist as a significant factor, a finding that has been reported in this population group in other studies [11]. In this regard it should be highlighted that there is a considerable lack of knowledge about the matter and only 24% of respondents accepted that it means an individual's death.

The most important factors detected in this population of Latin American origin that reside in Florida that

persisted in the multivariate analysis were mainly related to four aspects; level of education, awareness of the subject, the family, and manipulation of the body. Consequently, it has been seen that talking about the matter in family circles increases the possibility of being in favour. In this context the respondent's partner's attitude towards donation plays a fundamental role. Therefore, it would seem to be beneficial to encourage dialogue about matters of donation and transplantation in family circles and with one's partner [3,4,32]. However, this most elementary mechanism for providing information and enabling decision-making comes up against ancestral taboos that prevent or hinder conversations about death. In this regard, Guadagnoli *et al.* [33] stated that 50% of those who wish to donate do not communicate this decision to their family.

Another group of independent variables is related to manipulation of the body [23,34]. Generally, those who have an unfavourable attitude towards donation, are more afraid of the manipulation and disfiguration of the body and have a preference for a whole or intact body after death [34]. Alternatively, those who would either prefer cremation of the body, or would be willing to have an autopsy carried out if one were necessary, or would not be concerned about mutilation of the body after death, have a significantly more favourable attitude towards organ donation.

Such an unfavourable attitude of the LA population in Florida towards donation and the low rates of donation reported in this subgroup make it necessary to act to try to reverse this situation. We can benefit from the experience gained in Spain where the attitude of this population subgroup from LA is fairly favourable and donation rates are similar to the native population. Depending on the means of each health centre, we need to work together to improve this situation. Therefore we consider it necessary to take three courses of action: (i) to provide basic information on organ donation and transplantation, and the concept of brain death, so that LA people are not worried about the process. To do this, you can give informative talks and create clear and simple informative dip types on the subject. (ii) To raise awareness of the importance of organ transplantation in the LA population, where there is an important percentage of LA patients awaiting transplantation, especially of the kidney. This includes highlighting the improvement in the quality of life that a transplant involves. (iii) Finally, it is essential that they feel integrated into the health system and that they can have access to a transplant if they need it. In Spain, full integration into the health system, with the right to organ transplantation, has been a key factor for achieving the high donation rates among the immigrant population. The US health system is very different from the Spanish one, but ways of integrating the health of the LA population will need to be found if there is to be an improvement in their donation rates.

To conclude, the attitude of LA residents in Florida towards organ donation is favourable only in one-third of those surveyed and it is associated with psychosocial factors.

Authorship

AR: conceived and designed the study. AR, AL-N, MAA-G, JAG and MJS: performed acquisition of a substantial portion of data. AR, AL-N, JAG, MJS, PR and PP: analysed and interpreted the data. AR and ALN: drafted the manuscript. AR, AL-N and GG: critically revised the manuscript for important intellectual content. AR and AL-N: provided statistical expertise. AR: obtained funding for this project or study and supervised the study. AR, AL-N, MAA-G, JAG, GG, PR, MJS and PP: approved the final version to be published.

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