

Opinion Toward Living Liver Donation of Hospital Personnel From Units Related to Organ Donation and Transplantation: A Multicenter Study From Spain and Latin-America

Antonio Rios^{1,2,3,4,*}; Ana Lopez Navas^{1,2,5}; Marco Antonio Ayala Garcia^{6,7}; Jose Sebastian⁸; Anselmo Abdo Cuza⁹; Laura Martinez Alarcon^{1,2,3}; Ector Jaime Ramirez¹⁰; Gerardo Munoz¹¹; Gerardo Palacios⁸; Juliette Suarez Lopez¹²; Ricardo Castellanos⁹; Beatriz Gonzalez^{6,11}; Miguel Angel Martinez¹³; Ernesto Diaz^{6,7}; Pablo Ramirez^{1,2,3,4}; Pascual Parrilla^{3,4}

¹International Collaborative Donor Project, Murcia, Spain

²Regional Transplant Center, Ministry of Health, Murcia, Spain

³Transplant Unit, Surgery Service, Virgen of Arrixaca University Hospital, Murcia, Spain

⁴Department of Surgery, University of Murcia, Murcia, Spain

⁵Department of Psychology, San Antonio Catholic University, UCAM, Murcia, Spain

⁶Regional Hospital of High Specialty Bajío, Leon, Mexico

⁷Mexican Social Security Institute Delegation, Guanajuato, Mexico

⁸Transplant Coordination Center, UMAE Specialist Hospital, Monterrey, Mexico

⁹Surgical Medical Research Center, Havana, Cuba

¹⁰University of Guanajuato, Guanajuato, Mexico

¹¹The 21st Century National Medical Center of the Mexican Institute of Social Security, Mexico City, Mexico

¹²Hermanos Ameijeiras Hospital, Havana, Cuba

¹³State Public Health Institute of Guanajuato, Leon, Mexico

*Corresponding Author: Antonio Rios, International Collaborative Donor Project, Murcia, Spain. Tel: +968-270757; Fax: +968-369716; E-mail: arzrios@um.es

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Background: Hospital personnel of services related to donation and transplantation process play a fundamental role in the development of transplantation.

Objectives: The aim of this study was to investigate the attitude toward living liver donation (LLD) among hospital personnel from services related to donation and transplantation in hospital centers in Spain and Latin America.

Materials and Methods: Eight hospitals within the "International Donor Collaborative Project" were selected, three in Spain, three in Mexico and two in Cuba. The study was performed in transplant-related services, using a randomized sample, which was stratified by the type of service and job category.

Results: In total, 878 workers were surveyed of which 82% (n = 720) were in favor of related LLD, 10% (n = 90) were against and 8% (n = 68) undecided. Attitudes toward related LLD were more favorable in the following groups: the Latin Americans (86% in favor vs. 77% among the Spanish; P = 0.007); younger people (37 vs. 40 years, P = 0.002); those in favor of either deceased donation (P < 0.001) or living kidney donation (P < 0.001); those who believed that they might need a transplant in the future (P < 0.001); those who would accept a liver from a living donor (P < 0.001); those who discussed the subject of donation and transplantation with their families (P = 0.040); and those whose partner was in favor of donation and transplantation (P = 0.044).

Conclusions: Personnel from donation and transplantation-related units had a favorable attitude toward LLD. This attitude was not affected by psychosocial factors, although it was influenced by factors directly and indirectly related to the donation and transplantation process.

Keywords: Liver; Hospital personnel; Attitude; Transplant

1. Background

Despite the risk of donor and its comparatively worse results, living liver donation (LLD) has become an ethically acceptable option, because it would make it possible to decrease mortality on liver transplant waiting list (1-3). However, in countries where the concept of brain death is not culturally acceptable, it is considered as the main way to procure transplant organs (4, 5). In most countries of Spanish speaking world, this method of donation is

practically unheard. According to LLD figures for Spain in 2009, the LLD rate was 0.6 per million population, similar to the level in Mexico and Cuba (5-7). One of the barriers preventing the development of LLD is possibly the attitude of hospital workers themselves who are not always in favor (6-8). Therefore, it is important to determine the attitude of workers in hospitals related to the donation and transplantation process, because they would deter-

mine how well-known LLD would be. The data in this regard, in Spanish speaking areas, are promising, but they have been only confirmed in one hospital. Therefore, it seems important to assess other centers as well (7). In this way, our group analyzed the attitude in transplant-related services in a transplant hospital in the South East of Spain, and found that it was very favorable (77% were in favor of related LLD) (7). However, it is necessary to increase this percentage and improve information in this regard if we wish to expand LLD. It has also been observed that youngest workers from this unit were those who were most in favor, which led us to believe that there could be a promising future for this type of liver donation, which is so necessary given organ deficit we are facing (7).

2. Objectives

The aim of this study was to analyze the attitude toward LLD among hospital personnel of services related to donation and transplantation process in hospitals in Spain and Latin America (Mexico and Cuba), and to analyze the variables affecting this attitude.

3. Materials and Methods

3.1. Study Population

Eight hospitals within the "International Collaborative Donor Project" were selected, three from Spain, three from Mexico and two from Cuba. In these hospitals, random sampling was performed, which was stratified according to service and job category (physicians, nursing personnel, healthcare assistants and non-healthcare personnel) among transplant-related services. These services were grouped into three categories: 1) donor procurement units (intensive care units, postoperative recovery unit and neurosurgery unit); 2) transplant units (general and digestive apparatus surgical service, urology service and cardiovascular service); and transplant patient follow-up units (internal medicine of the digestive apparatus, nephrology and cardiology service). The status of liver transplantation in the three countries is presented in Table 1.

3.2. Opinion Survey and Study Variables

Attitude toward LLD was assessed using a survey of psychosocial aspects towards organ donation and transplantation in our geographical area (6-8). The questionnaire was completed anonymously in 3 to 5 minutes and was

self-administered. For distribution of questionnaires in each hospital, contact was made with the head of service for questionnaires for physicians, with nursing coordinator for nursing personnel and healthcare assistants, and an administrator for non-healthcare personnel, who were given an explanation of the study and were made responsible for distributing the survey in selected work shifts. Attitude toward related and unrelated LLD was assessed as the dependent variable. The independent variables were: 1) Demographic: country; 2) Socio-personal: age, gender and marital status; 3) Job: type of clinical service, type of hospital, service according to its association with transplantation, type of personnel, job category and job situation; 4) Knowledge and attitude toward organ donation and transplantation: personal experience of organ donation and transplantation, attitude toward deceased donation, a belief in the need for a transplant for oneself in the future, attitude toward living kidney donation and attitude toward receiving a liver from a living donor if one was necessary; 5) Social interaction and pro-social behavior: discussion about donation and transplantation within the family, a partner's opinion toward donation and transplantation and performing pro-social type activities; 6) Religious: a respondent's religion and a respondent's knowledge of the attitude of his or her religion toward donation and transplantation; and 7) Attitude toward the body: concern about mutilation after donation.

3.3. Statistical Analysis

Data was analyzed using the SPSS 15.0 (SPSS Inc., Chicago, IL, USA) statistical package. A descriptive statistical analysis was performed, and for the comparison of different variables Student's t-test and χ^2 test were applied together with an analysis of remainders. For determination and evaluation of multiple risks, logistic regression analysis was used using statistically significant variables in bivariate analysis. In all cases, $P < 0.05$ was considered statistically significant.

4. Results

4.1. Attitude Toward LLD

Of 878 workers surveyed, 354 were from Spain (40%), 386 from Mexico (44%) and 138 from Cuba (16%). Regarding the attitude toward related LLD, 82% ($n = 720$) were in favor, 10% ($n = 90$) were against and 8% ($n = 68$) undecided. If LLD was considered as unrelated, 22% ($n = 196$) were in favor.

Table 1. Status of Liver Transplantation in Spain, Mexico and Cuba ^a

Data of 2012	Spain	Mexico	Cuba
Total Deceased Organ Donors, Annual Rate pmp	35.1	3.6	9.9
Total Liver Transplant, Annual Rate pmp	23.2	0.9	1.3
Liver Transplant of Living Donor, Annual Rate pmp	0.6	0.1	0

^a Abbreviation: pmp, per million of population.

Table 2. Demographic and Social-Personal Variables Affecting Attitude Toward Related Living Liver Donation Among Personnel of Hospital Services Related to Organ Donation and Transplantation Process in Spain, Mexico and Cuba ^{a,b}

Variable	In Favor (n = 720; 82%)	Not in Favor (n = 158; 18%)	P Value
Demographic			
Country			0.007
Spain (n = 354)	273 (77)	81 (23)	
Mexico (n = 386)	327 (85)	59 (15)	
Cuba (n = 138)	120 (87)	18 (13)	
Socio-Personal			
Age, y	37 ± 10	40 ± 10	0.002
Gender			0.944
Male (n = 339)	279 (82)	60 (18)	
Female (n = 531)	438 (83)	93 (17)	
DK/NA (n = 8)	3	5	
Marital status			0.665
Single (n = 306)	252 (82)	54 (18)	
Married (n = 495)	412 (83)	83 (17)	
Widowed, separated, divorced (n = 66)	52 (79)	14 (21)	
DK/NA (n = 11)	4	7	

^a Abbreviation: DK/NA, Does not know/No answer.

^b Data are presented as No. (%).

4.2. Factors Affecting Attitude Toward Related LLD

4.2.1. Demographic Variable

Regarding country, attitude was more favorable among Cuban workers (87% in favor; n = 120) and Mexicans (85%; n = 327) than Spanish (77%; n = 273) (P = 0.007) (Table 1).

4.2.2. Socio-Personal Variables

Among socio-personal variables, only age was identified. In this way, those who were in favor were younger than those who were not (37 ± 10 years vs. 40 ± 10 years) (P = 0.002) (Table 1).

4.2.3. Job Variables

In this group of variables, there were no significant associations regarding attitude toward LLD (P > 0.05) (Table 2).

4.2.4. Variables of Knowledge and Attitude Toward Organ Donation and Transplantation

In this group of variables, acceptance of other types of donation (deceased and living kidney) encouraged acceptance of LLD. Those who were in favor of deceased donation had a more favorable attitude toward LLD than those who were not (86% vs. 69%; P < 0.001). This was also the case for those who were in favor of living kidney dona-

tion who had more supportive attitude toward LLD (90% vs. 10%; P < 0.001). In addition, believing the possibility of needing a transplant oneself in the future encouraged acceptance of LLD compared to those who did not consider this option (88% vs. 71%) (P < 0.001); similarly, a more favorable attitude was found among those who would accept a liver from a living donor if one was needed compared to those who were undecided in these circumstances (96% vs. 61%; P < 0.001) (Table 3).

4.2.5. Variables of Social Interaction and Pro-Social Behavior

The variables of social interaction were significantly associated with an attitude in favor of LLD. Among these social variables, having spoken about donation and transplantation within the family encouraged acceptance of this type of donation compared to those who had not ever (83% vs. 77%) (P = 0.040). Knowing a partner's opinion about donation and transplantation was also important. Those who had a partner who was in favor of donation and transplantation had a more favorable attitude toward LLD than those whose partner was against it (89% vs. 82%) (P = 0.044). Finally, having pro-social type activities or intending to perform them encouraged a favorable attitude toward LLD compared to those who were not interested in them (79%-86% vs. 63%; P < 0.001) (Table 3).

Table 3. Job Variables Affecting Attitude Toward Related Living Liver Donation Among Personnel of Hospital Services Related to Organ Donation and Transplantation Process From Spain, Mexico and Cuba ^{a,b}

	In Favor (n = 720; 82%)	Not in Favor (n = 158; 18%)	P Value
Type of service where the respondent works			0.627
Surgical (n = 382)	316 (83)	66 (17)	
Medical (n = 496)	404 (81)	92 (19)	
Type of hospital			0.072
Transplant Hospital (n = 736)	596 (81)	140 (19)	
Procurement Hospital (n = 142)	124 (87)	18 (13)	
Service according to its relationship with transplantation			0.546
Donor Procurement Units (n = 367)	295 (80)	72 (20)	
Transplant Units (n = 375)	313 (83)	62 (17)	
Transplant Follow-up Units (n = 136)	112 (82)	24 (18)	
Type of Personnel			0.382
Healthcare Personnel (n = 771)	629 (82)	142 (18)	
Non-healthcare Personnel (n = 107)	91 (85)	16 (15)	
Job category			0.262
Physician (n = 310)	262 (85)	48 (15)	
Nursing (n = 356)	285 (80)	71 (20)	
Healthcare Assistant (n = 105)	82 (78)	23 (22)	
Non-healthcare personnel (n = 107)	91 (85)	16 (15)	
Job situation			0.324
Permanent Position (n = 377)	305 (81)	72 (19)	
Temporary, contracted (n = 461)	385 (84)	76 (16)	
DK/NA (n = 40)	30	10	

^a Abbreviation: DK/NA, Does not know/No answer.

^b Data are presented as No. (%).

4.2.6. Religious Variables

In this group, no significant associations were found ($P > 0.05$) (Table 4).

4.2.7. Variables of Attitude Toward the Body

No association was found between attitude toward the body and acceptance of LLD ($P > 0.05$) (Table 5).

4.3. Multivariate Analysis of Factors Affecting Attitude Toward LLD

In the multivariate analysis, two variables were found to have the greatest weight-affecting attitude toward living liver donation (Table 5): 1) A favorable attitude toward living kidney donation (Odd Ratio = 43.478; $P < 0.001$); and 2) Acceptance of living liver donation if the respondent needed it (OR = 9.615; $P < 0.001$).

Table 4. Variables of Knowledge and Attitude Toward Organ Donation and Transplantation, Social Interaction and Pro-Social Behavior Affecting Attitude Toward Living Liver Donation Among Personnel of Hospital Services Related to Organ Donation and Transplantation Process from Spain, Mexico and Cuba ^{a,b}

Variable	In Favor (n = 720; 82%)	Not in Favor (n = 158; 18%)	P Value
Knowledge About and Attitude Toward Organ Donation and Transplantation			
Personal experience of donation and transplantation			
Yes (n = 299)	248 (83)	51 (17)	0.603
No (n = 579)	472 (82)	107 (18)	
Attitude toward deceased donation			< 0.001
In Favor (n = 686)	587 (86)	99 (14)	
Against-Undecided (n = 192)	133 (69)	59 (31)	
Possibility of needing a transplant			< 0.001
Yes (n = 424)	371 (88)	53 (12)	
No (n = 14)	10 (71)	4 (29)	
Doubts (n = 440)	339 (77)	101 (23)	
Attitude toward living kidney donation			< 0.001
Yes (n = 242)	218 (90)	24 (10)	
Yes, only related (n = 548)	493 (90)	55 (10)	
Never (n = 32)	4 (12)	28 (88)	
Undecided (n = 56)	5 (9)	51 (91)	
Acceptance of LLD if it was necessary			< 0.001
Yes (n = 484)	463 (96)	21 (4)	
No (n = 134)	98 (73)	36 (27)	
Doubts (n = 259)	158 (61)	101 (39)	
DK/NA (n = 1)	1	-	
Social Interaction and Social Behavior			
Family discussion about donation and transplantation			0.040
Yes (n = 677)	565 (83)	112 (17)	
No (n = 201)	155 (77)	46 (23)	
One's partner's opinion toward donation and transplantation			0.044
Yes, in favor (n = 450)	402 (89)	48 (11)	
I do not know it (n = 179)	147 (82)	32 (18)	
Yes, against (n = 44)	36 (82)	8 (18)	
I do not have a partner (n = 142)	118 (83)	24 (17)	
DK/NA (n = 63)	17	46	
Performing pro-social activities			< 0.001
Yes (n = 223)	177 (79)	46 (21)	
No, never (n = 54)	34 (63)	20 (37)	
No, but I would like to (n = 566)	485 (86)	81 (14)	
DK/NA (n = 35)	24	11	

^a Abbreviation: DK/NA, Does not know/No answer.^b Data are presented as No. (%).

Table 5. Religious Variables and Variables of Attitude Toward the Body Affecting Attitude Toward Related Living Liver Donation Among Personnel of Hospital Services in the Organ Donation and Transplantation Process From Spain, Mexico and Cuba ^{a,b}

Variable	In Favor (n = 720; 82%)	Not in Favor (n = 158; 18%)	P Value
Religious			
Respondent's Religion			0.419
Catholic (n = 664)	574 (86)	90 (14)	
Other religions (n = 22)	17 (77)	5 (23)	
Atheist/agnostic (n = 142)	120 (84)	22 (16)	
DK/NA (n = 50)	9	41	
Knowledge of the attitude of one's religion toward donation and transplantation			0.108
Yes, in favor (n = 388)	332 (86)	56 (14)	
Yes, against (n = 12)	8 (67)	4 (33)	
I do not know it (n = 276)	242 (88)	34 (12)	
DK/NA (n = 10)	9	1	
Attitude Toward the Body			
Concern about mutilation after donation			0.668
I am concerned (n = 110)	97 (88)	13 (12)	
I am not concerned (n = 699)	606 (87)	93 (13)	
DK/NA (n = 69)	17	52	

^a Abbreviation: DK/NA, Does not know/ No answer.

^b Data are presented as No. (%).

Table 6. Variables Affecting the Attitude Toward Living Liver Donation Among Hospital Services of Organ Donation and Transplantation Process in SPAIN, Mexico and Cuba (A Multivariate Study)

Variable	Regression Coefficient (β)	Standard Error	Odds Ratio (Confidence Intervals)	P Value
Attitude toward living kidney donation				
Not in favor (n = 88)			1	
In favor (n = 790)	3.777	0.461	43.478 (111.111-17.857)	< 0.001
Acceptance of living liver donation if it was necessary				
Doubts (n = 259)			1	
Yes (n = 484)	2.261	0.334	9.615 (18.518-5)	< 0.001
No (n = 134)	0.048	0.298	1.049 (1.883-0.584)	0.872

5. Discussion

Morbidity and mortality on liver transplant waiting list are increasing (9, 10) forcing professionals to search alternatives to deceased donation (5, 11, 12). Therefore, in spite of its risk, LLD is the only real option for increasing the number of liver transplants and attempting to reduce the number of patients who die waiting for a liver transplant (13-16). Until now, in the Spanish speaking world, LLD donation rates have been minimal and almost non-existent (5). To encourage LLD, it has become necessary to improve the social image of this kind of donation (17).

Therefore, it is fundamental to investigate the attitude of population about this matter (18). In this sense, personnel from transplant-related units are fundamental and should be involved in the matter, given that they are influential groups for the public and therefore could affect the decisions made by potential donors (6, 7, 19, 20). The data from this study showed that there was a favorable predisposition for attitude toward LLD among personnel of units related to organ donation and transplantation process. It is important to highlight the differences found

between the countries of this study. Attitude was more favorable in respondents from Latin American countries, where both donation and transplantation activities are much lower than Spain. It is possible that high rates in Spain and therefore high number of transplants performed annually (5) led to contradictory effects in these hospitals, because they are in contact with comparatively more cases, which are both successful and complicated, unlike places with a low productivity rate, as Latin America. Possible complications lead to longer hospital stays and involve the occurrence of experiences and emotions in some workers, which provoke hesitation regarding the effectiveness of these treatments. This is why it is important to adequately select people who are going to work in these units; because of their job position, they have a strong influence on public opinion. However, in Latin America, where we said that living liver transplantation is in its infancy, such a positive response of hospital workers may reflect something desirable, but not very realistic. On analyzing variables affecting attitude toward LLD, we found that except for age, no significant associations were found with any other factors related to socio-personal, job, religious matters and/or attitude toward the body. There is a lack of difference according to various job characteristics. It was found that attitude was similar among physicians, nurses, healthcare assistants and non-healthcare personnel, a fact which is very different to that reported in attitude toward deceased donation (21-23). A direct association was found between attitude toward LLD and attitude toward deceased organ donation; being in favor of deceased organ donation encouraged acceptance of LLD. This aspect is quite well known (6, 17) and therefore well accepted that promotion of deceased organ donation encourages living organ donation (24). However, in solid organ units related to donation and transplantation, only 78% of workers were in favor of deceased organ donation. This aspect should be taken into account, because they are an important group for influencing public opinion. Having a profile of favorable attitude toward such a therapy should be considered as a crucial factor for hiring personnel in units related to organ donation and transplantation. Otherwise, workers would indirectly prejudice the therapy performed in their units. There is a notable association between attitude toward LLD and attitude toward two other factors. Firstly, it is associated with factors very closely related to feelings of reciprocity, which is treating others in a way we like to be treated. In this way, if respondent believes that there is a possibility of needing a transplant in the future and in this case accepting living liver donation, this would clearly encourage a positive attitude toward living liver donation. Secondly, attitude is related to family type social interaction factors. This fact is associated with related donation, where mainly emotional factors have an influence (6, 7, 17). Another aspect of this matter different from what we considered until now is attitude toward unrelated living donation. Here emotional factors play a

secondary role, and the acceptance rates decrease to 22%. This acceptance is relatively high compared to those reported in other geographical areas, especially in English speaking societies where the population data show less acceptance (25). However, this fact is outside the objective of this study and should be assessed in future studies, especially nowadays, where in western and North American countries, unrelated LLD rates are increasing and involve the Latin American population in a high percentage of cases (5). It is possible that cultural and social factors, as well as economic incentives could be behind these unrelated donations. To conclude, hospital personnel of units related to donation and transplantation process had a favorable attitude toward LLD, especially Latin American workers. This attitude is not affected by psychosocial factors, but by factors directly and indirectly related to donation and transplantation process.

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