

**Original Communication****RESEARCH ON BODY DONATION WILLINGNESS IN CORDOBA-ARGENTINA: MEDICAL AND DENTIST DOCTORS' ATTITUDE**

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**ABSTRACT**

Medicine and Dentistry are the only careers performing human body dissection and teaching-learning of Anatomy with cadaveric material in our university. Physicians and dentists' knowledge and opinion on the topic are particularly important because they could be considered as potential procurators due to their contact and influence on patient's decisions. We surveyed 528 professionals (429 physicians and 99 dentists) collecting some demographic data and questions about organ and whole body donation. Results showed that 94% should donate organs for transplantation, 66% knew about body donation, 66% was interested in further information and 48% should be willing to donate the own body for teaching and research. Main reasons to donate were to support teaching and research, contribute to the science and to be useful. In conclusion, we found that professionals had a very positive attitude in relation to body donation, independently of gender, age, religion, regional origin or specialities, but with significant differences between physicians and dentists. Compared with students, they had better attitude which could be related to a better information and experience. In comparison with the few published articles we found, our results were similar to Ireland and very different to India, improving our expectancies about the success of developing a donation program. Organ and body donation are always an act of altruism and social solidarity.

**Key words:** *Body donation; physicians; dentists; professionals; body donation program.*

nuestra universidad. El conocimiento y opinion de médicos y odontólogos sobre el tema es particularmente importante porque podrían ser considerados como potenciales procuradores debido a su contacto e influencia sobre la decision de los pacientes. Encuestamos 528 profesionales (429 médicos y 99 odontólogos) sobre datos demográficos y preguntas relacionadas con la donación de órganos y del cuerpo complete. Los resultados mostraron que el 94% donaría sus órganos para trasplante, el 66% sabía sobre la donación de cuerpos, 66% tenía interés en mayor información y 48% donaría su propio cuerpo para docencia e investigación. Las principales razones para donar fueron apoyar a la docencia e investigación, contribuir con la ciencia y ser útil. En conclusion, hallamos que los profesionales tienen una actitud muy positive hacia la donación del cuerpo, independientemente del sexo, edad, religion, region de origen o especialidad, pero con significativas diferencias entre medicos y odontólogos. Comparado con los estudiantes, ellos mostraron mayor actitud lo que podría estar relacionado a mayor información y experiencia. En comparación con los pocos trabajos publicados que hallamos, nuestros resultados fueron similares a los de Irlanda y diferentes a la India, estimulando nuestras expectativas para el desarrollo exitoso de un programa de donación. La donación de órganos y cuerpo es siempre un acto de altruismo y solidaridad social.

**Palabras clave:** *Donación de cuerpos; medicos; odontólogos; profesionales; programa de donación de cuerpos*

**RESUMEN**

Medicina y Odontología son las únicas carreras que realizan disección en cuerpos humanos y enseñanza-aprendizaje de la Anatomía en material cadavérico en

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## INTRODUCTION

In 2018 we initiated a research project to determine the attitude of different groups in relation to body donation, with the aim in the development of a donation program for the National University of Cordoba.

Medicine and Dentistry are the only careers performing human body dissection and teaching-learning of Anatomy with cadaveric material in the National University of Cordoba. Then, we considered important to include a group of medical and dentist doctors to be surveyed about their opinion on the importance of this material for their professional training and their attitude about the donation of their own body for university teaching and research.

Their professional knowledge and opinion on the topic are particularly important because they could be considered as potential procurators due to their contact and influence on patient's decisions.

The objective of the present article was to request information about the importance assigned by medical and dentist doctors to the corpses for teaching-learning and research in Anatomy and their will to donate organs and the own body.

## MATERIAL AND METHOD

Five hundred and twenty eight professionals among medical doctors and dentists, with regular activity in the city of Cordoba were surveyed. The main inclusion condition was living in Cordoba city or, at least, developing regular activity in the city. The importance of this close relation with the city was to be included in the distance from the university determined by a donation program. There were not exclusion conditions related to the university, place or time of graduation, or the area of their working activity, except professors of Anatomy or professionals working in any Chair of Anatomy who were not included. Professionals were surveyed mainly, but not exclusively, at public and private working institutions.

The questionnaire was about age, gender, nationality and province of origin, religion, profession, speciality, surgical practice, importance assigned to corpses for teaching-learning of Anatomy, willingness to donate his/her organs for transplantation, knowledge about whole body donation, interest in learning about body donation, willingness to donate the own body and reasons for that.

Results were reported in percentages and differences were considered significant if  $p < 0.05$ .

Chi square test was used for the analysis of the results to evaluate the association of qualitative variables.

The statistical software used was INFOSTAT.

This study was carried on with the approval and support of the Science and Technology Secretary of the National University of Cordoba (SECYT-UNC). Proyecto Formar 2018-19 - 33820180100313CB01

## RESULTS

Of the total 528 professionals 48.30% (255) were women and 51.70% (273) men. The mean age was  $41.56 \pm 11.36$ , with the lower in 23 and the higher in 81. We considered 4 age groups: a) 23 to 34 years: 173 (32.77%) professionals, b) 35 to 49 years: 213 (40.34%) professionals, c) 50 to 64 years: 129 (24.43%), d) over 65 years: 12 (2.27%).

Five hundred and sixteen of the respondents were Argentine (97.73%) while the foreigner professionals were from Bolivia (3), Chile (1), Colombia (1), Mexico (1), Paraguay (1), Peru (2), United States (1) and United Kingdom (1). One did not answer.

Argentina professionals were 70.35% (363) from Cordoba. Even if the remaining 29.65% included professionals coming from all the provinces, the higher percentages were from San Juan (4.07%), Salta (3.68%), Jujuy (2.71%), Santa Fe (2.52%) and La Pampa (2.13%).

About the religion, most were Catholics (361 – 68.37%), followed by those who did not profess any religion (136 – 25.71%), non-Catholic Christians (16 – 3.03%), Jewish (7 – 1.33%) and others (8 – 1.52%). There were not Muslims among the surveyed professionals.

Four hundred and twenty nine (81.25%) were physicians and ninety nine (18.75%) dentists. Among medical doctors we surveyed professionals on 60 different specialities, while among dentists we identified 12 specialities. To facilitate the understanding and analysis, we considered: a) clinical specialities, b) surgical specialities, c) clinic-surgical specialities, d) other specialities and e) none speciality. (Table 1 summarizes the specialities of surveyed professionals into the different groups). Clinicians were 209 (39.58%), surgeons were 130 (24.62%), professionals with specialities involving both (clinics and surgery) were 91 (17.23%), other specialists were 47 (8.90%) and professionals without speciality were 51 (9.66%). Independently of the speciality, 272 (51.52%) referred to have surgical practice.

Specialities	Physicians	Dentists
<b>Clinical</b>	Cardiologists	Clinics
	Clinics and Internists	Endodontists
	Dermatologists	Generalists
	Diabetologists	Pediatrics
	Endocrinologists	Periodontists
	Familiar doctors	
	Gastroenterologists	
	Generalists	
	Hematologists	
	Immunologists	
	Infectologists	
	Intensivists	
	Nefrologists	
	Neumonologists	
	Neurologists	
	Nutritionists	
	Oncologists	
	Pediatric intensivists	
	Pediatrics	
	Reumatologists	
Toxicologists		
<b>Surgical</b>	Cardiac surgeons	Implantologists
	Cardio-vascular surgeons	Surgeons
	General Surgeons	
	Head and neck surgeons	
	Maxilo-facial surgeons	
	Neuro-surgeons	
	Orthopedists	
	Pediatric ardivascular	
	Pediatric surgeons	
	Plastic surgeons	
	Thoraci surgeons	
	Vascular surgeons	
	Urologists	
<b>Clinico-surgical</b>	Emergentologists	Orthodontists
	Flebologists	Protestists
	Gynecologists	
	Imagenologists	
	Obstetricians	
	Ophthalmologists	
	Otolaryngologists	
<b>Others</b>	Anatomo-pahtologists	Oral radiologists
	Anesthetists	Oral rehabilitation
	Cytologists	
	Epidemiologists	
	Farmacologists	
	Forensic	
	Hemotherapist	
	Legal doctors	
	Medical auditor	
	Microbiologists	

	Occupational doctors	
	Physiatrists	
	Psychiatrists	
	Public Health doctors	
	Teachers - Professors	
<b>None</b>	No speciality	No speciality

Table 1.- Specialities included in each group

For 492 (93.18%) of them, corpses were very important for teaching-learning of Anatomy, for 32 (6.06%) they were less important and for 4 (0.76%) they were no important.

Four hundred and ninety four (93.56%) were willing to donate organs for transplantation.

Three hundred and fifty (66.29%) of the respondents said to know about whole body donation, 351 (66.48%) should like to get more information and 255 (48.30%) should be willing to donate their own body for university teaching and research. Instead potential donors were mostly men (53.73%) the difference with women was not statistically significant ( $p=0.3691$ ). There were not significant differences either between the age-groups ( $p=0.6405$ ), foreigners/argentine ( $p=0.9288$ ), Cordoba/other province's citizens ( $p=0.2519$ ), among different specialities ( $p=0.4637$ ) or between those who had or had not surgical practice ( $p=0.5764$ ) in their attitude towards donation. Religions did not mean a difference ( $p=0.0555$ ) however people who did not profess any religion were more willing to donate (59.56%) than others. Twenty five per cent (8) of the people who considered corpses "less important" for Anatomy teaching were interested in donation of their own body. Only 4 persons were willing to donate the whole body but not organs for transplantation.

There was a significant difference ( $p<0.0001$ ) in the interest to donate between people who wanted or did not want to get further information. Among people who wanted to donate 87.45% (223) wished to be more informed, but among those who were not willing to donate 46.07% (123) should like to get information.

Main reasons to donate were to support teaching and research 118 (46.27%), to contribute to the science 16 (6.27%), to be useful 15 (5.88%) and 47 (18.43%) did not answer (Table 2 summarizes all reasons to donate). Among a long list of not well founded motives, the main causes not to donate were the family 30 (11.28%), lack of information 27 (10.15%), cremation choice 20 (7.52%), religion 14 (5.26%) and 44 (16.54%) who did not respond (Table 3 summarizes all reasons not to donate).

Reasons to donate	n	%
Teaching	101	39.61%
Contribution to science	16	6.27%
To be useful	15	5.88%
Teaching and research	13	5.1%
Is important	10	3.92%
Is necessary	5	1.96%
Priority transplantation	4	1.56%
Research	4	1.57%
Altruism	3	1.18%
It won't be me	3	1.18%
Only a body	3	1.18%
Just yes	2	0.78%
Lack of information	2	0.78%
Medicine development	2	0.78%
Reciprocity	2	0.78%
Very useful	2	0.78%
According to the profession	1	0.39%
Autopsy importance	1	0.39%
Body is disposable	1	0.39%
Dead teach living	1	0.39%
Doesn't work for me	1	0.39%
For posgraduates	1	0.39%
I agree with this training	1	0.39%
I had liked to learn so	1	0.39%
More useful than burial	1	0.39%
No problem	1	0.39%
Not 100% sure	1	0.39%
Not for Anatomy	1	0.39%
Practic training	1	0.39%
Real bodies	1	0.39%
Teaching honor	1	0.39%
To help	1	0.39%
To inform	1	0.39%
To progress	1	0.39%
Volunteer	1	0.39%
Why not?	1	0.39%
Empty	47	18.43%

Table 2.- Reasons expressed to donate the own body

Comparing physicians and dentists, we found medical doctors were significantly older ( $p < 0.0001$ ) instead age average was only 1.10

years higher. There was also significant difference in: A) religion professing ( $p = 0.0086$ ) as physicians had a higher percentage of non-professing (28.67% / 13.13%) and dentists had a higher rate of Catholics (77.78% / 66.20%); B) speciality groups ( $p < 0.0001$ ) as physicians had a bigger group of "other specialities" (10.49% / 2.02%) and dentists were more in the group of "none speciality" (22.22% / 6.76%); C) surgical practice ( $p < 0.0001$ ) as the answer was positive for 78.79% of dentists and 45.22% of physicians; D) willingness to donate organs for transplantation ( $p = 0.0045$ ) was higher in medical doctors (94.64%) than dentists (88.89%); E) knowledge about the possibility to donate the own body ( $p = 0.0419$ ) was higher in physicians (68.30%) than in dentists (57.58%); F) the will to donate the own body ( $p = 0.0298$ ) as medical doctors were more willing (50.35%) than dentists (39.39%). There were no statistical differences by gender ( $p = 0.2471$ ), in the geographical origin of the surveyed professionals ( $p = 0.2048$ ), in the importance assigned to corpses for teaching-learning of Anatomy ( $p = 0.2746$ ) and the interest in getting more information ( $p = 0.2557$ ).

Reasons	n	%
Family	30	11.28%
Lack of information	27	10.15%
Preference of cremation	20	7.52%
Religion	14	5.26%
Department conditions	13	4.89%
Only transplantation	10	3.76%
I don't like	8	3.01%
Personal reasons	8	3.1%
Just no	7	2.63%
Poor control	7	2.63%
I won't be in a jar	6	2.26%
Replace the method	6	2.26%
Wrong treatment	6	2.26%
Don't know yet	5	1.88%
Didn't think about	4	1.50%
Modesty	4	1.50%
Not a choice	4	1.50%
Not interested	4	1.50%
Gives me impression	2	0.78%
Inadequate	2	0.75%
Lack of respect	2	0.75%
Preference of burial	2	0.75%
Student's lack of respect	2	0.75%

Unreadable	2	0.75%
Abnormal	1	0.38%
Another choice	1	0.38%
Another idea	1	0.38%
Bad memories	1	0.38%
Because of fixation techniques	1	0.38%
Believes	1	0.38%
Body desecration	1	0.38%
Distrust	1	0.38%
Don't be touched	1	0.38%
Don't want	1	0.38%
I made many ablations	1	0.38%
I'd donate parts	1	0.38%
Ideological reasons	1	0.38%
I'll feel pain	1	0.38%
I'm a public person	1	0.38%
Lack of Anatomy researchers	1	0.38%
Lack of legal guarantees	1	0.38%
Look in Anatomy	1	0.38%
Moral objection	1	0.38%
No reason	1	0.38%
Not decided	1	0.38%
Not sure	1	0.38%
Poor care / infrastructure	1	0.38%
System disagreement	1	0.38%
To use somebody else	1	0.38%
Want a Christian burial	1	0.38%
Won't be an specimen	1	0.38%
Empty	44	16.54%

Table 3.- Reasons not to donate the own body

## DISCUSSION

Instead at the end of the 20th century anatomy dissection was considered as “old fashioned” and in some cases excluded from the medical curricula in the belief that new technologies could replace it (Dyer and Thorndike, 2000), importance of corpses and dissection was restored by demonstrating that it was irreplaceable for graduate and postgraduate student's training (Biasutto et al., 2006; Azer and Eizenberg, 2007; Cahill and Ettarh, 2008; Sugand et al., 2010; Dereje, 2014; Narvaez-Hernandez and Murillo-Rabago, 2014; Arráez-Aybar et al., 2014).

Cadaver donation provides 100% of the total corpses used for university teaching in Anatomy in Australia, Austria, Canada, Chile, Czech Republic, Denmark, France, German, Ireland, Japan, Malta, Netherlands, New Zealand, Poland, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Thailand and United Kingdom, and most of the bodies in China, Portugal, South Africa, Taiwan, United States and Uruguay among the participating countries in the study of Habicht et al. (2018).

Most of the articles based on body donation surveyed the attitude of students under different circumstances (Cahill and Ettarh, 2008; Asl et al., 2010; Anyanwu et al., 2014; Saha et al., 2015; Quiroga-Garza et al., 2017; Biasutto et al., 2018; Ciliberti et al., 2018; Biasutto et al., 2019a,b). However, we consider of transcendental importance to know the attitude of professionals whose training and practice include Anatomy playing an important role, and because they could be naturally potential procurators in a donation program.

According to Arráez-Aybar et al. (2010) there is evidence to suggest that gross anatomy is considered by medical graduates to be the most relevant basic science discipline for surgical specialties. In our study, it was nearly unanimous that professionals of different specialties and half of them without surgical practice confirmed corpses as corner stone for teaching-learning of Anatomy.

Our study has demonstrated certain differences between medical doctors and dentists in relation to their will to donate as well organs for transplantation as whole body for Anatomy teaching and research. However, we could not find elements to explain it in the collected data; even when religion seemed to established a difference, it did not influenced the willingness to donate ( $p=0.1513$ ). Probably it was associated to the proportion of professionals in the study or differences in the access to information on this topic.

In the literature, most of the studies involving professionals were done surveying Anatomy teachers who were specifically excluded in our study (Arráez-Aybar et al., 2010; Anyanwu and Obikili, 2012; Emue et al., 2012; Quiroga-Garza et al., 2017).

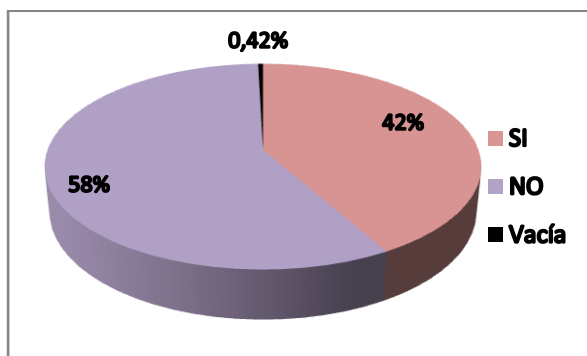
We found few references in the literature about studies on medical doctors.

Saha et al. (2015) reported a group of 100 physicians, between 35 and 45 years old, 50% male and female and significant differences with our study in the willingness to be organ donors for transplantation (86% -  $p=0.0023$ ) and/or whole body donors (26% -  $p<0.0001$ ). Among them, the main reason not to donate was the

conditions of the dissection room. They agreed with us in the need of information and education about the importance of body donation, and proper counselling and guidance to turn potential into real donors. We think that health professionals could collaborate with that orientation activity.

Another article based on the attitude of medical doctors was published by Ballala et al. (2011) as a study on 89 survey participants, with 57% males and 43% females and mostly (71%) between 25 and 34 years. Instead this study has pointed mainly on formal aspects of the donation process, there are some interesting aspects to compare with our results. Eight per cent did not know about body donation, instead of 32% in our study ( $p < 0.0001$ ). Most of them (85%) considered that donated corpses were misused, considering as "misused" disrespectful treatment, inappropriate disposal after use or sale for profit. In our study there was no mention to the possibility of sale for profit and all answers which could be associated with that concept of "misuse" represented 7% of the total ( $p < 0.0001$ ). Only 22 of them (25% -  $p < 0.0001$ ) should donate the own body but 89% considered that general public should donate mainly to contribute to medical progress (88%).

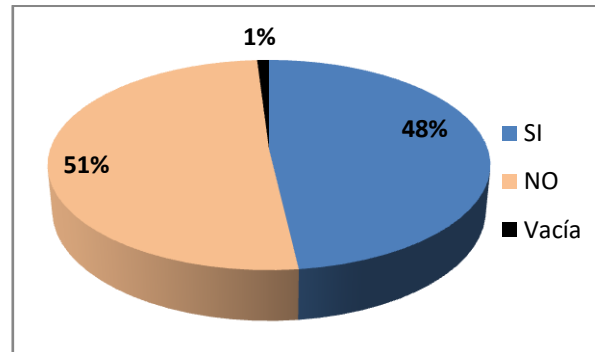
Green et al. (2014) studied a group of medical doctors at the St Vincent's University Hospital in Ireland. For 83% of those professionals dissection was valuable in their education, what means a lower percentage than those who considered corpses very important to learn Anatomy in our study (93% -  $p = 0.0002$ ); however it is difficult to say if both results have exactly the same meaning. Results in willing to donate organs for transplantation ( $p = 0.0687$ ) and the own body for university teaching and research ( $p = 0.4882$ ) were similar in both studies.



**Graphic 1.-** Students of Medicine willingness to donate

Comparing this study results with previous involving medical students (Biasutto et al. 2019b)

we realized that professionals had a significantly higher willingness towards body donation ( $p = 0.0137$ ). (Graphics 1 and 2.)



**Graphic 2.-** Professionals willingness to donate the own body.

In conclusion, we found that professionals had a very positive attitude in relation to body donation, independently of gender, age, religion, regional origin or specialities, but with significant differences between physicians and dentists. Compared with students, they had better attitude which could be related to a better information and experience. In comparison with the few published articles we found, our results were similar to Ireland and very different to India, improving our expectancies about the success of developing a donation program. Organ and body donation are always an act of altruism and social solidarity.

#### Conflict of interest

None

#### Funding

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#### Ethical Approval

Not necessary

#### Informed Consent

Survey participants were informed about the scope of the project and, in every case, answer it was strictly voluntary.

#### Contributions

SNB: Project design, group director, references, spreparation and coordination of the surveys, data registration, statistical analysis and manuscript redaction. OPD: Project design, project vice-director, references, preparation of



the surveys and collaboration in manuscript redaction. MAS: Project design, preparation of the surveys and survey collection. DU: Project design and preparation of the surveys. AJBV: Preparation and reception of the surveys and graphic designs. DMW: Preparation and reception of the surveys and graphic designs. IEMV: Preparation and reception of the surveys and graphic designs. RAAV: Preparation and reception of the surveys. LMN: Reception of surveys and data analysis SGS: Reception of surveys and data analysis FT: Reception of surveys and data analysis NL: Reception of surveys and data analysis FDO: Reception of surveys and data analysis SAP: Reception of surveys

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