

**Original Communication****PANDEMIC CHANGING ATTITUDE OF MEDICAL STUDENTS  
TOWARDS BODY DONATION**

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**ABSTRACT**

Between 2018 and 2020 we carried out a research project endorsed by the University Secretary of Science and Technology, based on different group's surveys, to obtain supporting data for the creation of the Program for Body Procurement and Donation. As the pandemic COVID-19 stopped all face-to-face educational activities and seriously affected the reception of bodies for teaching and research, in 2021 we reiterated a survey on some similar data, with the aim of evaluating the impact the pandemic had had on the opinion of two of these groups (medical students). This survey included 1406 students from all years of the career, who were asked about their knowledge on body donation and the Program, their interest in collaborating with it, their willingness to donate their own body and reasons for doing or not doing so. Results showed a similar composition of the samples in relation to age, gender, geographic origin, religion and differences in each year of the career (compared with those of 2018). Specific aspects also evidenced similarities about knowledge of the possibility of donating ( $p=0.0812$ ) and interest in collaborating with the Program ( $p=0.2460$ ), but reached 72% ( $p<0.0001$ ) in willingness to donate their own body. We also analyzed the reasons to donate and not donate in the context of the pandemic and concluded that it positively influenced these results; directly, due to the increased appreciation of scientific research and indirectly, because the pandemic facilitated communications and access to scientific information online.

**Key words:** *Body donation; Pandemic incidence; Willingness to donate; Medical students.*

**RESUMEN**

Entre 2018 y 2020 realizamos un proyecto de investigación (Secretaría de Ciencia y Tecnología - Universidad Nacional de Córdoba), basada en

encuestas a diferentes grupos, para obtener datos que respaldaran la creación del Programa para la Procuración y Donación de Cuerpos. Dado que la pandemia COVID-19 detuvo todas las actividades educativas presenciales y afectó severamente la recepción de cuerpos para docencia e investigación, en 2021 reiteramos la encuesta sobre algunos datos similares con la finalidad de evaluar el impacto de la pandemia en la opinión de dos de esos grupos (estudiantes de Medicina). Se encuestaron 1406 estudiantes de todos los años de la carrera, a quienes se les preguntó sobre su conocimiento acerca de la donación del cuerpo y el Programa, su interés en colaborar con él, la voluntad de donar el propio cuerpo y las razones para hacerlo o no hacerlo. Los resultados evidenciaron una similar composición de las muestras en relación a la edad, género, origen geográfico, religión y diferencias entre cada año de la carrera (comparado con aquellos del 2018). Los aspectos específicos también mostraron similitud en el conocimiento de la posibilidad de donar ( $p=0,0812$ ) y el interés en colaborar con el Programa ( $p=0,2460$ ), pero la voluntad de donar el propio cuerpo llegó al 72% ( $p=0,0001$ ). También analizamos las razones para donar y para no donar en el contexto de la pandemia y concluimos que influyó positivamente, en forma directa porque incrementó la valoración de la investigación científica e indirectamente porque facilitó las comunicaciones y el acceso a la información científica en línea.

**Palabras clave:** *Donación del cuerpo; influencia de la pandemia; voluntad de donar; estudiantes de medicina.*

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## INTRODUCTION

It was not easy to convince university authorities about the need to create a body donation program. The possibility appeared in 2017 when we were asked to present data to support it; but it was simultaneously a great problem as there was not any program of this kind in Argentina and no specific information. Cultural components of other countries determined their societies to have different response, as probably also happens with the different regions of our own country. Countries where donation programs are undoubtedly successful developed them decades ago (and even a century ago) in circumstances, communications resources and legal frameworks completely different.

To take advantage of the possibility and provide the requested information we presented a research project to the University Secretary of Science and Technology to survey four groups (first year medical students, all years medical students, doctors in Medicine and Dentistry and general population of Cordoba city and surroundings). The project was approved by the Faculty of Medical Sciences and supported to be developed between 2018 to 2020. Data obtained included different aspects and results provided a lot and very valuable information, which supported the creation of the Program for Body Procurement and Donation (ProDoCue).

Faculty Directive Council approved the Program creation on April 2021 and the Committee immediately began to work. However, we were in a crucial moment because of the COVID-19 Omicron strain. All the managed data was essential to develop information strategies and to interpret people's attitude; but we asked ourselves about the validity of that data obtained during 2018 and 2019 as people had suffered the accurate attack of COVID, with isolation and thousands of deaths in their environment, including loved ones.

Under those circumstances, during the second half of 2021, we decided to spread out a new survey to medical students with the objective of evaluating the pandemic incidence on the willingness to donate the own body, in comparison with 2018-19 results.

## MATERIAL AND METHODS

A qualitative and relational cross-sectional study was carried out, based on an anonymous and voluntary survey, with multiple choice and semi-structured responses.

The survey was developed in a Google Form and distributed by the University digital system among all registered medical students.

Questions included data about age, gender, nationality, province of origin of Argentines, knowledge about the possibility to donate the body for teaching and research and the existence of a Faculty program for this purpose, interest in collaborating with the donation program and/or to donate the own body, and the reason to be willingness to donate or not.

There was no exclusion criteria, as all registered students were allowed to participate.

The limitations of the present study would be related to the group that answered the survey, since it was distributed to all students, but we cannot assure all received the invitation or the reasons why they answered or not.

Results were reported in percentages. We consider  $p < 0.05$  to be statistically significant. For the analysis of the results, the Chi square test was applied to evaluate the association of qualitative variables.

The statistical program used was INFOSTAT.

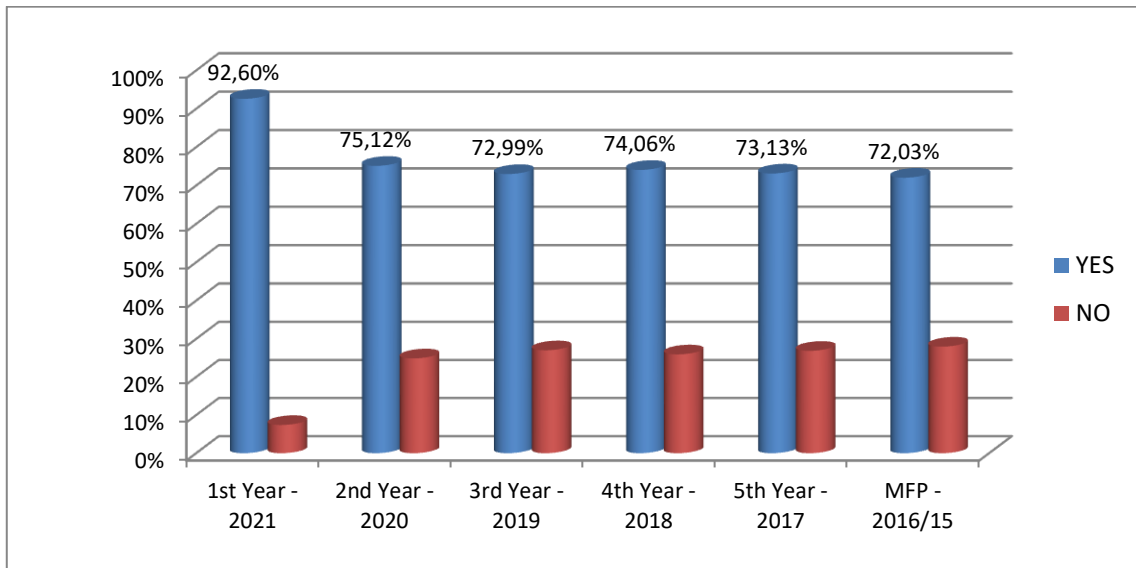
## RESULTS

The survey was answered by 1406 students from all years of Medicine career, including 455 from the 1st year, 242 from the 2nd year, 254 from the 3rd year, 212 from the 4th year, 160 from the 5th year and 83 from the mandatory final practice (MFP). Response rate was in all years over 50%, however it was not easy to determine the exact rate on each one due to the combined face-to-face and virtual activity during 2021 (some people from other provinces did not attend the face-to-face activities but were still regular in some courses).

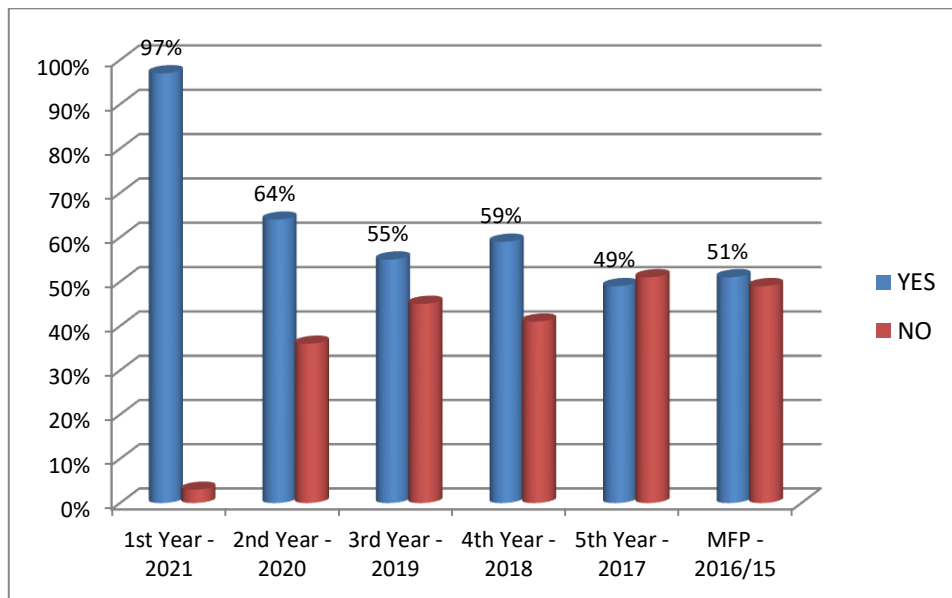
Of them total, 71.48% were women, 28.38% were men and 0.14% were in the group of "others", with media age in  $21.47 \pm 2.99$ .

Only 2.42% of them were foreigners (from Bolivia, Brazil, Chile, Colombia, Ecuador, Germany, Paraguay, Peru, Spain, South Africa, United States and Venezuela) while the remaining 97.58% were Argentine from all provinces, but 58.82% were from Cordoba province.

Asked if they knew it was possible to donate the own body to the university for teaching and research, 79.59% answered positively, with particular differences by year depending on the information they got. Graphic 1 includes the distribution by year of the career.



**Graphic 1** – Knowledge about the possibility of donating the own body among Medicine students of each year of the career. The year indicated below refers to the year they studied Anatomy.



**Graphic 2** - Knowledge about the existence of a Body Donation Program distributed by year of the career. The year indicated below refers to the year students studied Anatomy.

Knowledge about the Donation Program was also variable depending on the years as it raised to 97% in first year students and dropped to 49% in fifth year students (average: 70.34%). Graphic 2 includes distribution by year of the career.

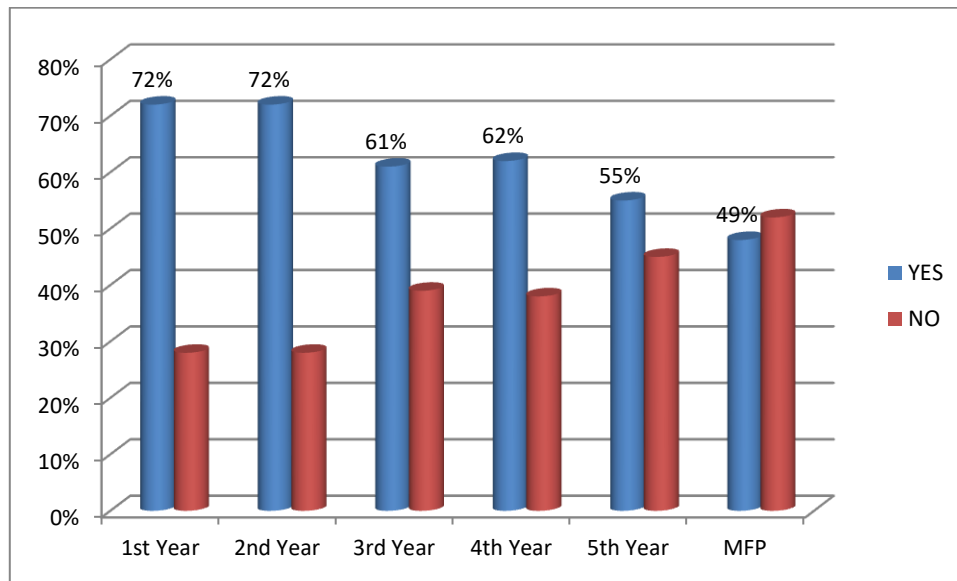
Asked if they should collaborate with the program as part of their usual activities, 75% agreed, with prevalence in 1st, 2nd and 3rd year students but with the lowest rate in 64% (5th year students).

Sixty three per cent were willing to donate the own body, with the particularity that this rate rised to 72% among first and second year students; those whose anatomical learning was particularly affected by the pandemic (Graphic 3)

Main reasons to donate were: a) Support to teaching (43%), b) Support to reseach (12%), c) To be useful (12%), d) To help (5%). The remaining specified reasons were under 5%.

Four per cent did not answer this question. People who would not agree to donate expressed their main reasons as follows: a) Only for transplantation (12%), b) Do not know (7%), c)

Want to be cremated (7%), d) No (7%), e) For the family (6%), f) For religion (6%), g) Do not like (5%), h) Lack of respect (5%). Twelve per cent did not answer.

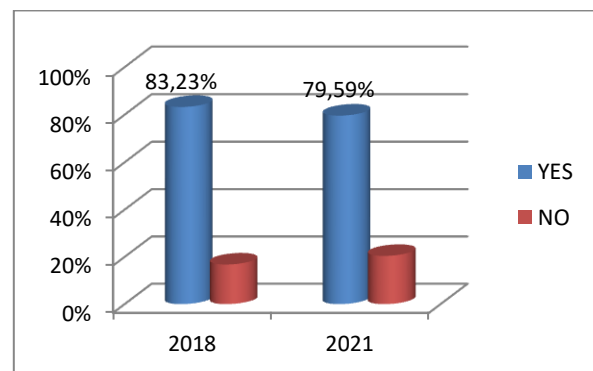


Graphic 3 – Student’s willingness to donate the own body distributed by year of the career.

**DISCUSION**

Results were compared with those obtained in 2018 to consider the pandemic incidence (Biasutto et al., 2019), instead some of them require certain considerations by themselves. The first aspect to keep in mind while evaluating these results is the fact that the Department of Anatomy recieved donations previous to the ProDoCue creation; however it was not organized and/or of public domain. Another important aspect is to consider that first year students were informed about the Donation Program during an activity of mandatory attendance, since the ProDoCue creation (2021). This class had the possibility of active student participation to clarify any doubt. Some information activities were also developed for students of all years of the career, but attendance was optional and only a small percentage participated. The inclusion of student-assistants in the ProDoCue Committee was of high relevance to access young people. When we observe graphics 1 and 2, related to the knowledge of the possibility of donating and the Donation Program, the incidence of specific information recieved by first year students is evident. While graphic 3 shows the significant high willingness to donate the own body in students

who studied Anatomy in 2020-2021 (years most impacted by the pandemic COVID-19) when students had access to digital images and virtual resources but nearly no contact with cadaveric material. These results should be interpreted under the light of pandemic circumstances and the importance students assigned to bodies for teaching-learning.



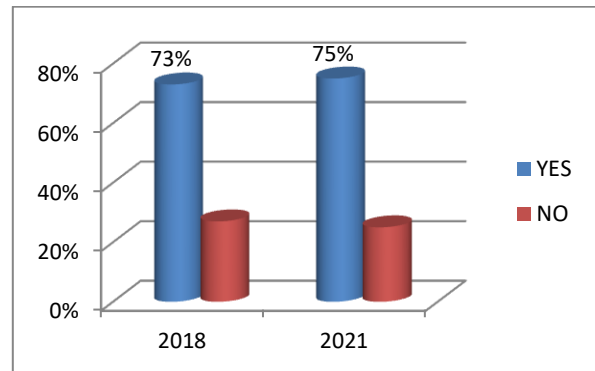
Graphic 4- Diference between 2018 and 2021 students related to the knowledge about the possibility to donate.

Compared with previous surveys (carried on in 2018 and published as Biasutto et al., 2019) we

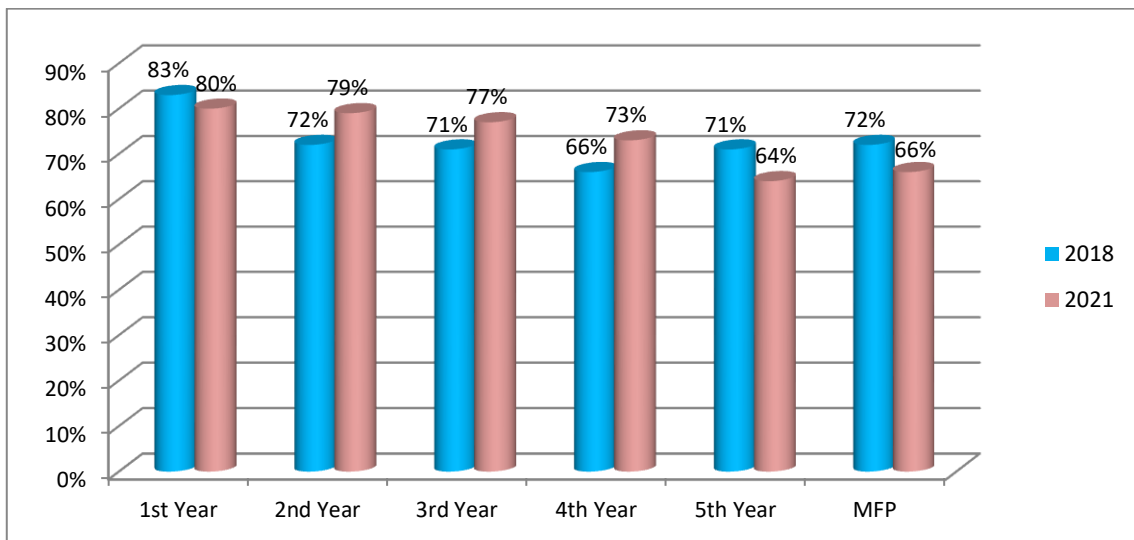
evidenced that, independently of the size of the sample (713 in 2018 and 1406 in 2021), the composition was very similar. There was not significant differences in age ( $21.58 \pm 2.84$  in 2018 vs  $21.47 \pm 2.99$  in 2021), gender ( $p=0.3165$ ) and geographical ( $p=0.3796$ ) composition. Student's knowledge about the possibility to donate did not show statistically significant difference between both groups ( $p=0.0812$ ), despite of the high rate of information on the subject that was evidenced by first year students in 2021. Graphic 4.

Positive attitude to collaborate with the body donation was similar between both groups ( $p=0.2460$ ) (Graphic 5A), with an increasing rate in 2nd, 3rd and 4th year and a particularly decreasing rate in 5th year and MFP students

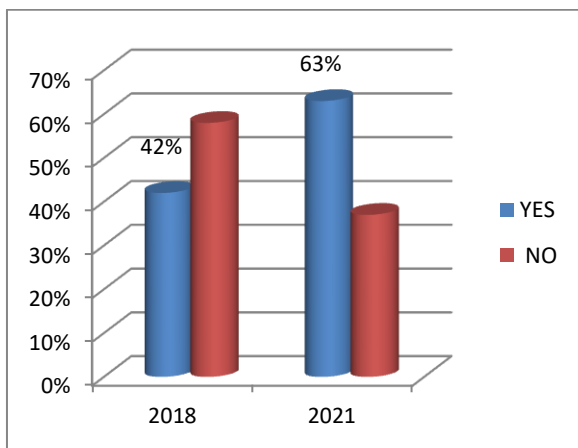
(Graphic 5B) linked to the intense study and work before graduation.



**Graphic 5A** – General difference in the attitude to collaborate with the body donation between 2018 to 2021



**Graphic 5B** – Discrimination by year in the attitude to collaborate with the body donation between 2018 to 2021



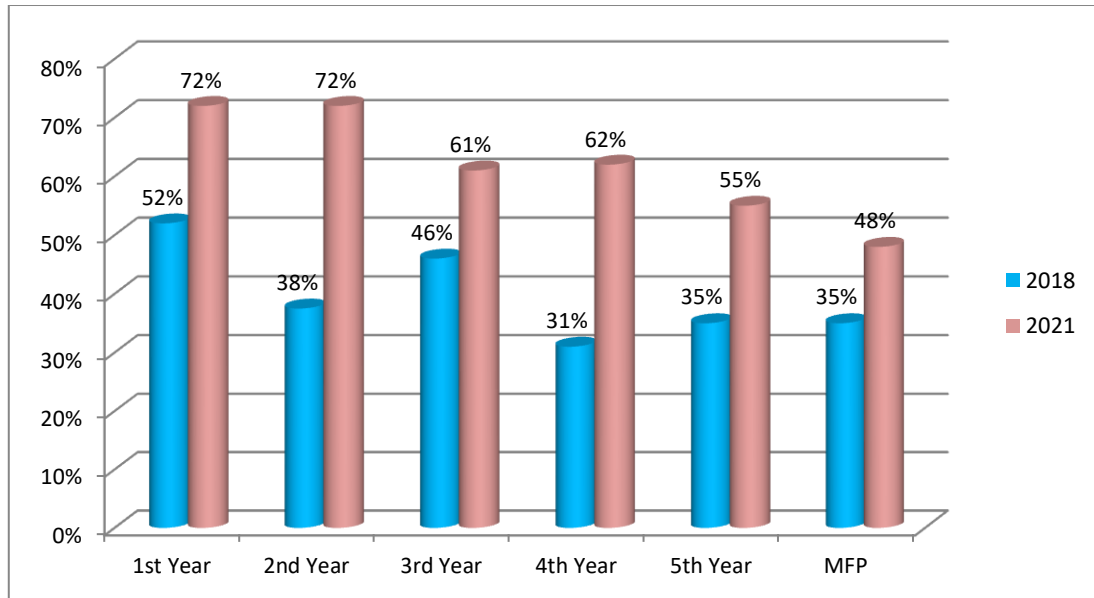
**Graphic 6A** – Significant increase in the willingness to donate the own body

But a very significant difference was found in the willingness to donate the own body with such a high increase that is difficult to explain ( $p < 0.0001$ ). General rate increased from 42% in 2018 to 63% in 2021 and higher percentages were found in each year of the career. (Graphic 6A and 6B). The only associated changing variable was gender, as the rate of women interested in donation exceeded men's rate and those in the group of "others" were all willing to donate (they were only 2) while in 2018 data was inverse. Graphic 7.

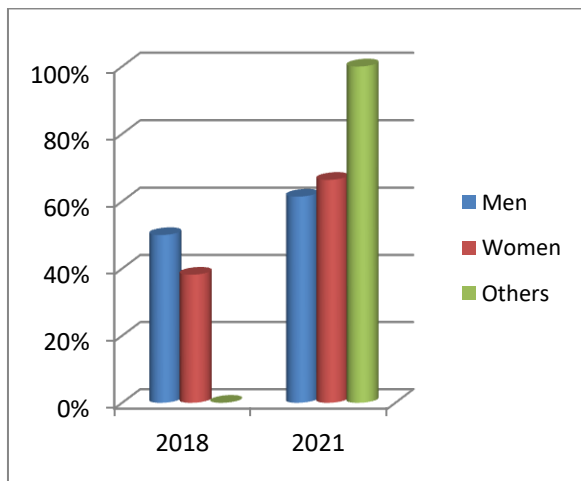
Reasons to donate and not to donate were similar in both groups (Tables 1 and 2) but we could point some particularities. Among reasons to donate, the highest prevalence was represented by the support to teaching/learning, which

seemed to be the priority for students; but research appeared with important percentages in all years of the career in 2021 while it did not happen in 2018. Reasons not to donate were very variable (as always) and considering each year of the career it is possible to observe

differences. A constant was those who only want to donate organs for transplant, but "lack of respect" was frequent in 2021 survey except among first year students as it agrees with the beginning of the ProDoCue as controller of corpse ethical treatment.



**Graphic 6B** – Every year the willingness to donate the own body increased significantly despite differences.



**Graphic 7** – Gender differences between 2018 and 2021 among students who evidenced willingness to donate the own body.

Did the pandemic circumstances and consequences caused this changing attitude? Was the pandemic able to highlight the importance of face-to-face practical activities? Was the pandemic able to evidence the importance of research? Even if the access to information about

body donation might had certain influence, it does not seem enough to explain the changing attitude.

We did not find in the literature publications related to the impact of the pandemic on the willingness to donate. However, McCumber et al. (2021) reported 50% of reduction in donations received by the United States universities and only 5.6% of the donation programs participating at the survey informed an increase.

Many articles were published evaluating the pandemic circumstances and consequences, however most of them were editorials or not data based ones (Bond and Franchi, 2020; Dost et al., 2020; Franchi, 2020; Murlimanju et al., 2020; Puljak et al., 2020; Singal et al., 2020; Banovac et al., 2021; Singal et al., 2021; Manzanares Cespedes et al., 2021; Suarez-Escudero et al., 2021; Gonzalez Fernandez and Salazar Sanchez, 2022).

As conclusión, the study showed both groups (2018 and 2021) to be very similar in composition and characteristics but with great increasing difference in the willingness to donate the own body. This change was attributed to the pandemic and, in a minority, to the growing information about body donation.

Survey	Year of the career	Teaching	Be useful	Research	It is necessary	It is important	Does not work for me	To help
2018	1st	54%	17%	7%	7%			
2018	2nd	38%	10%	21%				
2018	3rd	37%	16%					
2018	4th	39%	28%	7%		7%		
2018	5th	43%	20%		9%	6%		
2018	MFP	19%	10%	16%		6%		
2021	1st	49%	9%	15%				5%
2021	2nd	56%	11%	13%			7%	
2021	3rd	37%	17%	10%			6%	7%
2021	4th	37%	13%	7%				11%
2021	5th	27%	16%	10%				10%
2021	MFP	28%		10%			10%	10%

Table 1- Main reasons to donate (over 5%) distributed by year of the career and comparing both surveys.

Survey	Year of the career	Do not like	Family	Burial	Modesty	Not interested	Mis-treatment	OTr	Lak of respect	Do not think yet	Cr	Do not know	Rel	No
2018	1st	21%	8%	8%	7%									
2018	2nd		9%			21%	11%	10%	10%					
2018	3rd	6%	16%					28%		6%				
2018	4th	14%	14%				10%	19%	8%					
2018	5th	5%			6%		5%	20%	9%					
2018	MFP							30%	9%		7%			
2021	1st	7%	10%					9%		6%		9%		
2021	2nd		7%					20%	5%	5%	5%	8%	5%	
2021	3rd	6%						12%	11%			10%	5%	
2021	4th							11%	7%		15%		10%	9%
2021	5th							18%	6%				7%	7%
2021	MFP	7%							7%		14%		7%	16%

Table 2- Main reasons not to donate (over 5%) distributed by year of the career and comparing both surveys. OTr: Only for transplantation. Cr: Preference for cremation. Rel: Religion

**Conflict of Interest**

None

**Funding**

None

**Ethical Approval**

Not necessary

**Informed Consent**

All students were informed about the purpose of the study and only those who voluntarily decided to do so answered the survey.

**Contributions**

SNB: project management, formal analysis, conceptualization, writing, review and editing,

methodology and supervision. MAS: Research and original draft. CMQ: Research and original draft. JR: Research and original draft. SGS: Research. FB: Research. MLB: Research. FM: Research. MMV: Research. MAP: Research. MPP: Research.

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