

# Willingness toward donation in Mexico and the influence of personality

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## SUMMARY

Organ and body donation are key elements in health sciences. This study examines the perception of the population toward organ and body donation and how it may be influenced by personality traits. A cross-sectional study was designed, in which a questionnaire including items of demographic data and attitudes toward organ and body donation were distributed among the general population. A validated questionnaire for the screening of personality disorders was applied as well. 202 questionnaires were obtained, 76 (37.6%) from men and 126 (62.4%) from women. A total of 95.2% of women and 93.4% of men responded to be in favor of organ donation ( $p>0.05$ ). However, only 40.3 % of women and 37.8% of men were in favor of body donation. Sixty-eight percent of participants had a probable personality disorder. Of those against body donation, 67% had a probable personality disorder. Body donation is not a well-known option among the Mexican population. However, for a program to be feasible, it is necessary to raise public awareness regarding donation and its implications to achieve greater engagement.

**Key words:** Donation – Organ donation – Body donation – Dissection – Motivation for donation – Human anatomy – Education

## INTRODUCTION

Donation is a key element in medicine. Organ donation is widely accepted around the world and improves the quality of life of thousands every year (Milaniak et al., 2018). Not only is organ donation the ultimate way of contributing to medicine in an altruistic manner; body donation is too, in particular in research and education. The use of the human body has been a fundamental tool for teaching and studying gross anatomy for centuries (Biassuto et al., 2006; Jeyakumar et al., 2020; Tapia-Nañez et al., 2022). Students develop anatomical and surgical knowledge directly from the body, as well as professionalism and empathy (Papa and Vaccarezza, 2013; Quiroga-Garza et al., 2017; Reyes-Hernandez et al., 2016; Riederer, 2016; del Campo, 2016). Donation programs contribute to transplantation, medical education, and

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research (Garment et al., 2007; Querevalú-Murillo et al., 2012). However, many countries still lack a formal donation program. (Quiroga-Garza et al., 2017; Wainman and Cornwall, 2019; Salinas-Alvarez et al., 2020).

Along with history, there have been changes concerning the methods used to study medicine and anatomy (Korf et al., 2008; McBride and Drake, 2018; Salinas-Alvarez et al., 2020). The recent COVID-19 outbreak disrupted the traditional education settings and challenged medical schools to adopt the use of available tools and innovative technologies (Iwanaga et al., 2021; Krebs et al., 2021; Muñoz-Leija et al., 2020; Pather et al., 2020). The use of imaging studies, virtual and augmented reality, 3D impression, and simulation models, have been increasing in popularity for anatomy education (Baskaran et al., 2016; Chytas et al., 2020; Fernández-Reyes et al., 2022; Gadaleta et al., 2020). However, many anatomists argue the importance of donors for dissection and prosection to actively complement learning. Students develop anatomical and surgical knowledge directly from the body, as well as professionalism and empathy (Papa and Vaccarezza, 2013; Sanchez del Campo, 2015; Reyes-Hernández et al., 2016; Riederer, 2016; Quiroga-Garza et al., 2017; Guerrero-Mendivil et al., 2023).

Current, legislation, costs, and ethics have influenced the dissection practice in gross anatomy laboratories. There is a limitation in the availability of bodies, primarily in countries without body donation programs, as is the case in most of Mexico (Quiroga-Garza et al., 2022, 2017; Salinas-Alvarez et al., 2020). Most medical schools continue to use unclaimed bodies for dissection and prosection as teaching tools in the laboratory while lacking formal donation programs (Quiroga-Garza et al., 2017; Salinas-Alvarez et al., 2020; Wainman and Cornwall, 2019). Research regarding perspectives is scarce (Elizondo-Omaña et al., 2005). Mexico has a low rate of organ donation, below the necessities of the healthcare system, due to a low donation culture (Centro Nacional de Trasplantes, 2021; Ríos et al., 2014). To strengthen and implement current organ donation programs, it is important to consider the psychological aspects and the lack of information of the general population

(Hernández Rivera et al., 2020; Irving et al., 2012; Marván et al., 2017; Quiroga-Garza et al., 2017).

The objective of this study was to evaluate the perspective of the general population toward organ and body donation, as well as the personality spectrum of potential donors.

## MATERIALS AND METHODS

A cross-sectional, descriptive study was designed with the purpose of evaluating the perception of the population toward organ and body donation after death. Simultaneously, the presence of personality disorders and their relation with the perception toward organ and body donation were assessed. Two questionnaires were applied voluntarily and anonymously to the general population. Age of  $\geq 18$  years was required for inclusion. Those who were healthcare professionals and students were excluded.

The Salamanca questionnaire was used for screening personality disorders. The result of the Salamanca questionnaire is obtained by a score of  $\geq 4$ , which indicates a probable personality disorder, although further evaluation by a psychiatrist is necessary to confirm a diagnosis (García-Portilla et al., 2011; Giner Zaragoza et al., 2015). To assess attitudes and perceptions toward organ and body donation, a questionnaire was designed and validated by the Delphi method, in which demographic information was obtained as well (Supplement File 1). During recruitment of participants, the questionnaire and its purpose were explained by members of the research study, obtaining verbal informed consent. The questionnaires were printed and distributed at our University Hospital “Dr. José Eleuterio González”, a tertiary level healthcare institution in the north of Mexico.

Responses from all questionnaires were registered in a database using 2020 Microsoft Excel for Mac, version 16.43 (Microsoft Corp., Redmond, WA). These were then analyzed using SPSS statistical package, version 25.0 (SPSS Inc., Chicago, IL). For the statistical analysis, the variables were divided into positive (“strongly agree” or “agree”) and negative (“strongly disagree” or “disagree”) responses. Those who answered “neither agree nor disagree” were considered neutral. The sam-

ple size was decided by availability. Quantitative variables are summarized in measures of central tendency and dispersion, and qualitative variables in frequencies and percentages. Associations in qualitative variables were tested using Pearson's Chi-Squared test and by calculating the odds ratio (OR) and associated 95% confidence intervals (CI) to measure the degree of association. Variables with a p-value of <0.05 were considered statistically significant.

The study was previously reviewed and approved by the ethics and research committees of our institution, with the registration AH18-005, certifying that it adheres to the guidelines of the General Health Law on Health Research in Human Beings of our country, as well as international guidelines and the Declaration of Helsinki. No external funding was used. Due to the design and intervention of the study, informed consent was approved to be given verbally from all participants. The authors declare no conflicts of interest. All authors have reviewed the final version of the manuscript and certify their responsibility for the work.

## RESULTS

A total of 202 questionnaires were collected: most of the respondents, 126 (62.4%), were female and 76 (37.6%) were male. Ages ranged from 18 to 75 years and the mean age was of  $32 \pm 15$  years. Catholicism was the most prevalent religion (83%), and 62.8% of participants have a graduate educational level (Table 1). Knowledge of the terms "organ donation" and "body donation", the willingness of participants to donate after death, and the spectrum of personality disorders were evaluated (Table 2). No statistical differences were identified among these variables and willingness toward donation.

### Knowledge of donation

The term "organ donation" was recognized by 92.7% of female respondents and 89% of male respondents, in contrast to "body donation" which was known by only half of female respondents (51.2%) and 45.3% of male respondents (Table 2).

**Table 1.** Epidemiological characteristics of the study population as a whole.

Characteristic		All participants n = 202
Sex	Male	76 (37.6%)
	Female	126 (62.4%)
Age	mean±SD (years)	32 ±15.14
Religion	Catholic	151 (83%)
	Christian	15 (8.2%)
	Atheist	11 (6%)
	Other	5 (2.7%)
Education	Elementary	9 (4.5%)
	Middle	21 (10.6%)
	High School	34 (17.1%)
	Graduate	125 (62.8%)
	Postgraduate	10 (5%)

N: sample size; SD: standard deviation.

### Willingness toward donation

High acceptance toward organ donation was given in contrast to acceptance of body donation. Over 90% of male and female respondents expressed being in favor of organ donation after death, while more than 50% were unwilling towards body donation. However, of those who had a negative response toward donating their body after death (n 106), over half (n 59, 55.7%) lacked knowledge of the term.

### Screening for personality disorders

Sixty-eight percent of participants (n 137) had highly marked personality traits, which are classified as probable personality disorders. Of the 78 patients who were in favor of body donation after death, 51 (65.4%) had a probable personality disorder. Of the 191 participants who were in favor of organ donation, 130 (68%) had a probable personality disorder. Of those who answered to be against donating their organs after death (n 2), 1 had a probable personality disorder. Of those 106 participants who answered to be against body donation, 71 (67%) had a probable personality disorder. No statistical difference was found.

**Table 2.** Organ and Body Donation knowledge, willingness, and personality correlation.

		Organ Donation (%)					Body Donation (%)				
		n	P	U	N	p	n	P	U	N	p
<b>Knowledge</b>	Women	123	114 (92.7)	0 (0)	9 (7.3)	0.360	121	62 (51.2)	5 (4.1)	54 (44.6)	0.706
	Men	73	65 (89)	1 (1.4)	7 (9.6)		75	34 (45.3)	4 (5.3)	37 (49.3)	
<b>Willingness</b>	Women	126	120 (95.2)	5 (4)	1 (0.8)	0.850	124	50 (40.3)	9 (7.3)	65 (52.4)	0.920
	Men	76	71 (93.4)	4 (5.3)	1 (1.3)		74	28 (37.8)	5 (6.8)	41 (55.4)	
<b>Personality</b>	No PPD	65	61 (93.8)	3 (4.6)	1 (1.5)	0.860	65	27 (41.5)	3 (4.6)	35 (53.8)	0.625
	PPD	137	130 (94.9)	6 (4.4)	1 (0.7)		133	51 (38.3)	11 (8.3)	71 (53.4)	

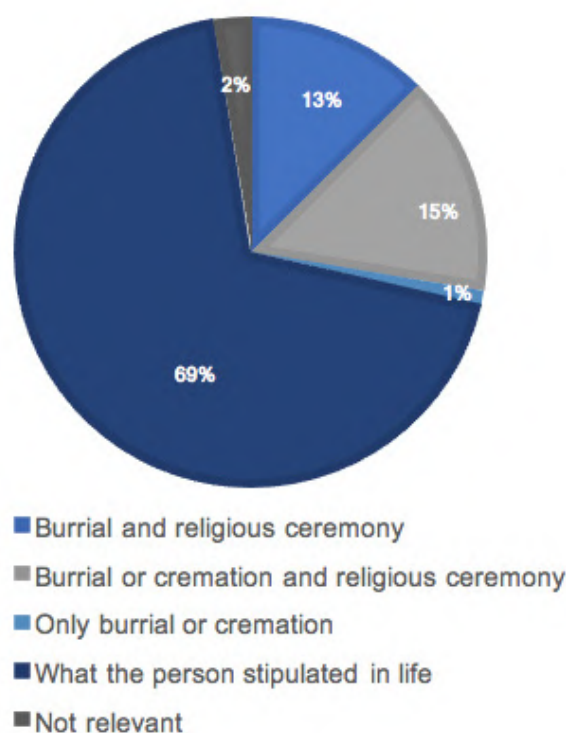
n: sample population. P: Positive (knowledge of what the term means, in favor and strongly in favor to donate); U, Undecided; N, Negative (no knowledge of what the term means, against and strongly against to donate); Body donation was specified for a period of 1 year. PPD, Probable Personality Disorder (4 or more points on an item of the questionnaire is considered to have a probable personality disorder which must be corroborated by a mental health professional). Presence or absence of a personality disorder was studied with the willingness toward donation. Statistical analysis: chi-squared test.

### Perceptions of body destination

Perception regarding what is considered appropriate regarding body destination after death was assessed as a multiple-choice question, but an open-ended option was included as well (Figure 1). Most participants (70%) consider it important to respect the wishes of the deceased. Twenty-eight percent of participants answered that burial or cremation with a religious ceremony was the preferred option. Only 2% reported it as “not relevant”.

### DISCUSSION

Our results demonstrate high knowledge and willingness towards organ donation. However, body donation is still a widely unknown term by the Mexican population. Most of the participants had strongly marked personality traits, which places them in a probable personality disorder category. However, we did not find statistically significant differences in trends toward donation among those with or without a probable personality disorder.

**Fig. 1.-** Participants' perception about what is considered appropriate regarding body destination after death.

Despite an apparent high willingness for organ donation from previous studies (Quiroga-Garza et al., 2017), the most recent data from the National Transplants Center CENATRA report 22,988 individuals on the waiting list for a transplant. Additionally, regarding the kidney –which is the most frequent organ transplanted– less than half (49%) in 2019 and less than a third (31.1%) in 2020 were from deceased-donor donations (Centro Nacional de Trasplantes, 2021).

In 2016, the first body donation program in Mexico was launched by the Universidad Nacional Autónoma de México. Since then, the program has been marked by its success and advances in education, research, and innovation through the use of donors (Michel Olguin, 2019). Quiroga-Garza et al. (2017) researched willingness towards organ and body donation among anatomy students, near-peers, and educators in the medical school of Universidad Autónoma de Nuevo León. They report a high favor towards both types of donation (Quiroga-Garza et al., 2017), in contrast to our results of the general population, who are mostly compliant towards organ donation, but not body donation. Similar results were reported in India (Rokade and Gaikawad, 2012).

The Netherlands legislation on human body disposal mentions donating one's body to science as an alternative to burial or cremation, which has led to an increase of body donor candidates (Bolt et al., 2010). These findings support the importance of raising public awareness about the possibility of willingly donating one's body after death (Aneja et al., 2013; Cornwall et al., 2012; Winkelmann, 2016), as well as the benefits of a donation program (Cornwall et al., 2012; O'Neill, 2009). Altruism and empathy play an important role in motivation for donation (Hill, 2016; Milaniak et al., 2018), and the creation of a socially accepted donation program ruled by the law would support those interested in contributing to science to willingly register (Bolt et al., 2011).

Body donors aid in the education of future generations, research in anatomical sciences, development of new surgical techniques, patient safety, development of prostheses and medical equipment (Houser and Kondrashov, 2018; Korf et al., 2008; Riederer, 2016; Tapia-Nañez et al., 2022).

The limitations of this study include the omission of the calculation of the minimum sample size. Our sample was too small to be representative of the general community, which also made it impossible to analyze the personality traits individually. Considering that we did not find statistically significant differences among our results, we encourage future research where the number of participants might be expanded to search for the association between attitudes toward donation and personality traits. The use of a highly sensitive test to assess personality traits categorizes most of the sample in a probable personality disorder. The psychological outcomes from this study must be interpreted with caution.

### **Strategies to improve the current panorama**

The International Federation of Associations of Anatomists published recommendations of good practice for the donation of human bodies and tissues for anatomical examination in 2012 (Jones, 2014). These include establishing a legal framework detailing the procedures and time frames; transparency and clear communication between the institution, potential donors, and their relatives; and encouragement for donors to discuss their intentions with their relatives to ensure that their wishes be carried out (Jones, 2014).

Cornwall et al. (2012) reported spouses, own children, and other closer relatives were the primary people who were consulted regarding donation. Donors' knowledge of body donation programs was primarily obtained through friends and family. A positive experience will provide a positive response among relatives that will help raise awareness of donation programs (Cornwall et al., 2012; El-Haddad et al., 2021).

Special lectures in ethics to students and health-care professionals handling human remains for anatomical education and research must be held. Potential donors have experienced negative feelings when thinking of the potential type of treatment given to their bodies during laboratory practice (Hu and Huang, 2015; Richardson and Hurwitz, 1995; Rokade and Gaikawad, 2012), which highlights the importance of following ethical standards that promote respect, transparency, and trust (Jones, 2014).

Programs must target the population depending on demographics (da Rocha et al., 2017; Mueller et al., 2021). Gender does not influence willingness to donate. However, white single women seem to be the most prevalent donors in some programs (da Rocha et al., 2017; El-Haddad et al., 2021; Mueller et al., 2021). Most donors report an altruistic motive, although aiding medical sciences for research purposes and worry of costs have also been reported (Cornwall et al., 2012; da Rocha et al., 2017; Gürses et al., 2019; Jiang et al., 2020).

Local, social, and cultural aspects as these may influence attitudes towards donation (El-Haddad et al., 2021; Habicht et al., 2018). Body donation programs should be in collaboration with mental health professionals to aid in the assessment, needs, and preferences of potential donors, to offer a vast and dignified program (Bolt et al., 2011; McClea and Stringer, 2013; Riederer, 2016). Commemoration services for those who donated their bodies for medical education and research should be performed (Jones, 2014; Pawlina et al., 2011). These commemoration ceremonies can also be shared with relatives and registered living donors (El-Haddad et al., 2021; Quiroga-Garza et al., 2017). Future studies should evaluate attitudes and perspectives of family members of donors.

In a study by Štrkalj et al. (2020), of the universities of 71 countries surveyed only one-third used exclusively donated bodies. Unclaimed bodies are still widely used (Caplan and DeCamp, 2019; Habicht et al., 2018; Salinas-Alvarez et al., 2020). This still implies uncertain ethical and legal parameters that must be updated through awareness of the populations (Chia and Oyeniran, 2020; Cornwall et al., 2012; Sasi et al., 2020).

## CONCLUSION

We found a positive outcome regarding attitudes toward organ donation. However, body donation in Mexico is a topic that remains unexplored and highly unaccepted. Our findings demonstrate that this population might show a positive response to a donation program that is well-funded and promoted. We suggest encouraging health professionals to explore donations and raise awareness among the surrounding community. Future stud-

ies are needed to determine factors influencing attitudes toward organ and body donation in underdeveloped countries. Efforts should be undertaken to change the mindset of the wider society toward body donation.

## REFERENCES

- ANEJA PS, BANSAL S, SOOD KS, SAXENA A (2013) Body donation - a dilemma among doctors. *J Evol Med Dent Sci*, 2. <https://doi.org/10.14260/jemds/582>
- BASKARAN V, ŠTRKALJ G, ŠTRKALJ M, DI IEVA A (2016) Current applications and future perspectives of the use of 3D printing in anatomical training and neurosurgery. *Front Neuroanat*, 10: 69.
- BIASSUTO SN, CAUSSA LI, CRIADO DEL RÍO LE (2006) Teaching anatomy: Cadavers vs. computers? *Ann Anat*, 188: 187-190.
- BOLT S, VENBRUX E, EISINGA R, KUKS JBM, VEENING JG, GERRITS PO (2010) Motivation for body donation to science: More than an altruistic act. *Ann Anat*, 192(2): 70-74.
- BOLT S, EISINGA R, VENBRUX E, KUKS JBM, GERRITS PO (2011) Personality and motivation for body donation. *Ann Anat*, 193(2): 112-117.
- CAPLAN I, DECAMP M (2019) Of discomfort and disagreement: unclaimed bodies in anatomy laboratories at United States Medical Schools. *Anat Sci Educ*, 12(4): 360-369.
- CENTRO NACIONAL DE TRASPLANTES (2021) Reporte Anual 2021 Receptores, Donación y Trasplantes en México. [<https://www.gob.mx/cms/uploads/attachment/file/692109/Anual2021.pdf>] Accessed: 01 May 2022.
- CHIA T, OYENIRAN O (2020) Ethical considerations in the use of unclaimed bodies for anatomical dissection: a call for action. *Ulutas Med J*, 6. [doi.org/10.5455/umj.20201229101758](https://doi.org/10.5455/umj.20201229101758)
- CHYTAS D, JOHNSON EO, PIAGKOU M, MAZARAKIS A, BABIS GC, CHRONOPOULOS E, NIKOLAOU VS, LAZARIDIS N, NATSIS K (2020) The role of augmented reality in Anatomical education: An overview. *Ann Anat*, 229: 151463.
- CORNWALL J, PERRY GF, LOUW G, STRINGER MD (2012) Who donates their body to science? An international, multicenter, prospective study. *Anat Sci Educ*, 5(4): 208-216.
- DA ROCHA AO, DE CAMPOS D, FARINA MA, PACINI GS, GIROTTI MC, HILBIG A (2017) Using body donor demographics to assist the implementation of donation programs in Brazil. *Anat Sci Educ*, 10(5): 475-486.
- EL-HADDAD J, PRVAN T, ŠTRKALJ G (2021) Attitudes of Anatomy students toward commemorations for body donors: a multicultural perspective. *Anat Sci Educ*, 14(1): 89-98.
- ELIZONDO-OMANA RE, GUZMÁN-LÓPEZ S, DE LOS ANGELES GARCÍA-RODRÍGUEZ M (2005) Dissection as a teaching tool: Past, present, and future. *Anat Rec B New Anat*, 285(1): 11-15.
- FERNÁNDEZ-REYES BA, FLORES-GONZÁLEZ AK, ALVAREZ-LOZADA LA, GUERRERO-ZERTUCHE JT, ARRAMBIDE-GARZA FJ, QUIROZ-PERALES XG, QUIROGA-GARZA A, ELIZONDO-OMANA RE, GUZMÁN-LÓPEZ S (2022) The importance of simulation training in surgical sciences. *Int Surg J*, 9: 1289-1293.
- GADALETA DJ, HUANG D, RANKIN N, HSUE V, SAKKAL M, BOVENZI C, HUNTLEY CT, WILLCOX T, PELOSI S, PUGLIESE R, KU B (2020) 3D printed temporal bone as a tool for otologic surgery simulation. *Am J Otolaryngol*, 41(3): 102273.
- GARCÍA-PORTILLA M, BASCARÁN M, SÁIZ P, PARELLADA M, BOUSOÑO M, BOBES J (2011) Instrumentos de evaluación para la personalidad y sus trastornos. Cuestionario Salamanca de Trastornos de la Personalidad. *Banco Instrumentos Básicos para la Práctica la Psiquiatría Clínica*, 6: 204-223.

- GARMENT A, LEDERER S, ROGERS N, BOULT L (2007) Let the dead teach the living: the rise of body bequeathal in 20th-century America. *Acad Med*, 82(10): 1000-1005.
- GINER ZARAGOZA F, LERA CALATAYUD G, VIDAL SÁNCHEZ ML, PUCHADES MUÑOZ MP, RODENES PÉREZ A, CÍSCAR PONS S, CHICLANA ACTIS C, MARTÍN VIVAR M, GARULO IBÁÑEZ T, TAPIA ALCAÑIZ J, DÍAZ ESTEBAN E, FERRER FERRER L (2015) Diagnóstico y prevalencia de trastornos de la personalidad en atención ambulatoria: estudio descriptivo. *Rev Asoc Esp Neuropsiquiatría*, 35. <https://doi.org/10.4321/s0211-57352015000400007>
- GUERRERO-MENDIVIL FD, ELIZONDO-OMANA RE, JACOBO-BACA G, QUIROZ-PERALES XG, SALINAS-ALVAREZ Y, MARTINEZ-GARZA JH, DE LA FUENTE-VILLARREAL D, QUIROGA-GARZA A, GUZMAN-LOPEZ S (2023) Payment with knowledge – a method for a training program of anatomy near-peer teachers and formation of future anatomists. *Anat Sci Edu*, doi: 10.1002/ase.2253. Online ahead of print.
- GÜRSER İA, ERTAŞ A, GÜRTEKİN B, COŞKUN O, ÜZEL M, GAYRETLİ Ö, DEMİRCİ MS (2019) Profile and motivations of registered whole-body donors in Turkey: Istanbul University Experience. *Anat Sci Educ*, 12(4): 370-385.
- HABICHT JL, KIESSLING C, WINKELMANN A (2018) Bodies for anatomy education in medical schools: An overview of the sources of cadavers worldwide. *Acad Med*, 93(9): 1293-1300.
- HERNÁNDEZ RIVERA JCH, MOJICA OD, MENDOZA MS, BARBOSA LS, ALEJANDRI LS, SILVA RUEDA RI, PÉREZ LÓPEZ MJ, COVARRUBIAS LG, ÁLVAREZ CRUZ NL, MEJÍA VELÁZQUEZ JL, MENDOZA CG, GUTIÉRREZ WN, PANIAGUA SIERRA JR (2020) Factors that influence the attitude of the population to be a donor in Mexico. *Transplant Proc*, 52(4): 1036-1041.
- HILL EM (2016) Posthumous organ donation attitudes, intentions to donate, and organ donor status: Examining the role of the big five personality dimensions and altruism. *Pers Individ Dif*, 88. <https://doi.org/10.1016/j.paid.2015.09.021>.
- HOUSER JJ, KONDRASHOV P (2018) Gross anatomy education today: the integration of traditional and innovative methodologies. *Mo Med*, 115(1): 61-65.
- HU D, HUANG H (2015) Knowledge, attitudes, and willingness toward organ donation among health professionals in China. *Transplantation*, 99(7): 1379-1385.
- IRVING MJ, TONG A, JAN S, CASS A, CHADBAN S, ALLEN RD, CRAIG JC, WONG G, HOWARD K (2012) Community attitudes to deceased organ donation: A focus group study. *Transplantation*, 93(10): 1064-1069.
- IWANAGA J, LOUKAS M, DUMONT AS, TUBBS RS (2021) A review of anatomy education during and after the COVID-19 pandemic: Revisiting traditional and modern methods to achieve future innovation. *Clin Anat*, 34(1): 108-114.
- JEYAKUMAR A, DISSANAYAKE B, DISSABANDARA L (2020) Dissection in the modern medical curriculum: an exploration into student perception and adaptations for the future. *Anat Sci Educ*, 13(3): 366-380.
- JIANG J, ZHANG M, MENG H, CUI X, YANG Y, YUAN L, SU C, WANG J, ZHANG L (2020) Demographic and motivational factors affecting the whole-body donation programme in Nanjing, China: A cross-sectional survey. *BMJ Open*, 10(9): e035539.
- JONES G (2014) Recommendations of good practice for the donation and study of human bodies and tissues for anatomical examination. *Plexus*, 12-14.
- KORF HW, WICHT H, SNIPES RL, TIMMERMANS JP, PAULSEN F, RUNE G, BAUMGART-VOGT E (2008) The dissection course - necessary and indispensable for teaching anatomy to medical students. *Ann Anat*, 190(1): 16-22.
- KREBS C, QUIROGA-GARZA A, PENNEFATHER P, ELIZONDO-OMANA RE (2021) Ethics behind technology-enhanced medical education and the effects of the COVID-19 pandemic. *Eur J Anat*, 25(4): 515-522.
- MARVÁN ML, ÁLVAREZ DEL RÍO A, JASSO K, SANTILLÁN-DOHERTY P (2017) Psychosocial barriers associated with organ donation in Mexico. *Clin Transplant*, 31(11). doi: 10.1111/ctr.13112.
- MCBRIDE JM, DRAKE RL (2018) National survey on anatomical sciences in medical education. *Anat Sci Educ*, 11: 7-14.
- MCCLEA K, STRINGER MD (2013) Why do potential body donors decide against donating? *NZ Med J*, 126(1377): 51-58.
- MICHEL OLGUIN FM (2019) Programa de Donación de Cuerpos, único en México. Gac. UNAM.
- MILANIAK I, WILCZEK-RUŻYCZKA E, PRZYBYŁOWSKI P (2018) Role of empathy and altruism in organ donation decisionmaking among nursing and paramedic students. *Transplant Proc*, 50(7): 1928-1932.
- MUELLER CM, ALLISON SM, CONWAY ML (2021) Mississippi's whole body donors: Analysis of donor pool demographics and their rationale for donation. *Ann Anat*, 234: 151673.
- MUÑOZ-LEIJA M, ZARATE-GARZA P, JACOBO-BACA G, QUIROGA-GARZA A, SALINAS-ALVAREZ Y, MARTINEZ-GARZA J, ELIZONDO-OMANA R, GUZMÁN-LÓPEZ S (2020) Modifications to the delivery of a gross anatomy course during the COVID-19 pandemic at a Mexican medical school. *Eur J Anat*, 24: 507-512.
- O'NEILL FK (2009) Giving from our bodily belongings: Is donation an appropriate paradigm for the giving of bodies and body parts?: What else might be considered? *HEC Forum*, 21(2): 151-174.
- PAPA V, VACCAREZZA M (2013) Teaching anatomy in the XXI century: New aspects and pitfalls. *Sci World J*, 2013: 310348.
- PATHER N, BLYTH P, CHAPMAN JA, DAYAL MR, FLACK NAMS, FOGG QA, GREEN RA, HULME AK, JOHNSON IP, MEYER AJ, MORLEY JW, SHORTLAND PJ, ŠTRKALJ G, ŠTRKALJ M, VALTER K, WEBB AL, WOODLEY SJ, LAZARUS MD (2020) Forced disruption of anatomy education in Australia and New Zealand: An acute response to the Covid-19 pandemic. *Anat Sci Educ*, 13(3): 284-300.
- PAWLINA W, HAMMER RR, STRAUSS JD, HEATH SG, ZHAO KD, SAHOTA S, REGNIER TD, FRESHWATER DR, FEELEY MA (2011) The hand that gives the rose. *Mayo Clin Proc*, 86(2): 139-144.
- QUEREVALÚ-MURILLO W, OROZCO-GUZMÁN R, DÍAZ-TOSTADO S, HERRERA-MORALES KY, LÓPEZ-TELIZ T, MARTÍNEZ-ESPARZA AC (2012) Iniciativa para aumentar la donación de órganos y tejidos en México. *Rev Fac Med*, 55(1): 12-17.
- QUIROGA-GARZA A, REYES-HERNÁNDEZ CG, ZARATE-GARZA PP, ESPARZA-HERNÁNDEZ CN, GUTIERREZ-DE LA O J, DE LA FUENTE-VILLARREAL D, ELIZONDO-OMANA RE, GUZMAN-LOPEZ S (2017) Willingness toward organ and body donation among anatomy professors and students in Mexico. *Anat Sci Educ*, 10: 589-597.
- QUIROGA-GARZA A, GARZA-CISNEROS AN, ELIZONDO-OMANA RE, VILCHEZ-CAVAZOS JF, DE-OCA-LUNA RM, VILLARREAL-SILVA E, GUZMAN-LOPEZ S, GONZALEZ-GONZALEZ JG (2022) Research barriers in the Global South: Mexico. *J Glob Health*, 12: 03032.
- REYES-HERNÁNDEZ CG, DE LA O-GUTIÉRREZ J, DE LA FUENTE-VILLARREAL D, JACOBO-BACA G, QUIROGA-GARZA A, SALINAS-ZERTUCHE A, ELIZONDO-OMANA RE, GUZMAN-LÓPEZ S (2016) Students helping students: Five years of experience. *Anat Sci Educ*, 9(4): 400-401.
- RICHARDSON R, HURWITZ B (1995) Donors' attitudes towards body donation for dissection. *Lancet*, 346(8970): 277-279.
- RIEDERER BM (2016) Body donations today and tomorrow: What is best practice and why? *Clin Anat*, 29(1): 11-18.
- RÍOS A, LÓPEZ-NAVAS A, AYALA-GARCÍA MA, SEBASTIÁN MJ, ABDO-CUZA A, ALÁN J, MARTÍNEZ-ALARCÓN L, RAMÍREZ EJ, MUÑOZ G, SUÁREZ-LÓPEZ J, CASTELLANOS R, RAMÍREZ R, GONZÁLEZ B, MARTÍNEZ MA, DÍAZ E, RAMÍREZ P, PARRILLA P (2014) Spanish-Latin American multicenter study of attitudes toward organ donation among personnel from hospital healthcare centers. *Cir Esp*, 92(6): 393-403.

ROKADE SA, GAIKAWAD AP (2012) Body donation in India: Social awareness, willingness, and associated factors. *Anat Sci Educ*, 5(2): 83-89.

SALINAS-ALVAREZ Y, QUIROGA-GARZA A, MARTINEZ-GARZA JH, JACOBO-BACA G, ZARATE-GARZA PP, RODRÍGUEZ-ALANÍS KV, GUZMAN-LOPEZ S, ELIZONDO-OMANA RE (2020) Mexican educators survey on anatomical sciences education and a review of world tendencies. *Anat Sci Educ*, 11: 1-11.

SANCHEZ DEL CAMPO F (2015) El cadáver en la enseñanza de la Medicina. *Ann Real Acad Med Comunitat Valencia*, 16: 1-4.

SASI A, HEGDE R, DAYAL S, VAZ M (2020) 'Life after Death – the dead shall teach the living': a qualitative study on the motivations and expectations of body donors, their families, and religious scholars in the South Indian city of Bangalore. *Asian Bioeth Rev*, 12(2): 149-172.

ŠTRKALJ G, EL-HADDAD J, HULME A (2020) A global geography of body acquisition for anatomy education: issues, challenges and prospects. In: Chan LK, Pawlina W (eds). *Teaching Anatomy*. Springer, Cham, pp 223-235. [https://doi.org/10.1007/978-3-030-43283-6\\_24](https://doi.org/10.1007/978-3-030-43283-6_24)

TAPIA-NAÑEZ M, QUIROGA-GARZA A, GUERRERO-MENDIVIL FD, SALINAS-ALVAREZ Y, JACOBO-BACA G, DE LA FUENTE-VILLARREAL D, GUZMAN-LOPEZ S, ELIZONDO-OMANA RE (2022) A review of the importance of research in Anatomy, an evidence-based science. *Eur J Anat*, 26: 477-486.

WAINMAN BC, CORNWALL J (2019) Body donation after medically assisted death: an emerging consideration for donor programs. *Anat Sci Educ*, 12(4): 417-424.

WINKELMANN A (2016) Consent and consensus—ethical perspectives on obtaining bodies for anatomical dissection. *Clin Anat*, 29(1): 70-77.