

ORIGINAL ARTICLE

An international opinion poll of well-educated people regarding awareness and feelings about organ donation for transplantation

Félix Cantarovich,^{1,2} Ricardo Heguilén,² Mario Abbud Filho,³ Valter Duro-Garcia,⁴ Robert Fitzgerald,⁵ David Mayrhofer-Reinhartshuber,⁶ Maria-Luisa Lavitrano⁷ and Vincent L. M. Esnault⁸

1 Transplantation Department, Necker Hospital, Paris, France

2 Catholic University, Buenos Aires, Argentina

3 Faculdade de Medicina, CINTRANS and Instituto de Urologia e Nefrologia, Sao Jose do Rio Preto, Brazil

4 Complexo Hospitalar Irmandade Santa Casa de Misericórdia de Porto Alegre, Brazil

5 Ludwig Boltzmann Institute for Economics of Medicine in Anesthesia and Intensive Care, Vienna, Austria

6 Health Care Communication, Vienna, Austria

7 Milan University, Milan, Italy

8 Nephrology, Pasteur Hospital, Nice University, France

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Correspondence

Félix Cantarovich, Service de Transplantation et Réanimation, Hôpital Necker, 161 rue de Sèvres, 75743 Paris, France. Tel./fax: +33-145273403; e-mail: fscantarovich@compuserve.com

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Summary

Despite repeated campaigns promoting transplantation, the high donation refusal rate remains unchanged. We targeted a well-educated population to assess the impact of our current transplantation promoting programs and personal feelings toward new approaches to organ donation. A questionnaire was proposed in five universities to students and university staffs that would have been likely to benefit from previous information campaigns in two South American and three European countries. All of the 2321 people interviewed replied to at least one question. Organ shortage was considered as a serious public health issue. However, there was a widespread ignorance of religious precepts concerning transplantation that contributed to the low acceptance rate of organ sharing after death. Financial rewards for donors or their families remain controversial. There was a general agreement for early educational programs in schools. Most people still consider organ donation as a gift, but many would now agree to readily share body parts after death. This biased population of well-educated people has still little knowledge of organ donation. The negative impact of ignorance surrounding religious precepts and the high acceptance rate of educational programs in schools, justify supporting an intensive international effort in education that should also include Church leaders.

Introduction

Waiting lists for organ transplantation are growing longer worldwide [1–3]. To enlarge the donor pool, living donor programs have been developed and recently extended to unrelated living donors. Poor quality marginal cadaveric grafts are also being increasingly accepted [4]. Hotly debated new strategies for organ donation include legal financial rewards for the donor or their families [5–11], and tighter regulation in order to prevent any refusal of

organ donation [12–14]. On a global scale, current legislation requires the physician to check whether the deceased person and/or his/her family have agreed to the principle of organ donation, as few people possess organ donor cards that certify their willingness to donate after death [15–17]. Despite repeated campaigns aimed at promoting transplantation, the refusal rate for organ donation remains very high, particularly among less educated populations. Although several polls have shown that the majority of people understand and accept the

importance of organ transplantation, daily experience goes to show that such sympathetic feelings are frequently cast aside in a situation such as when someone close has recently passed away. Understanding this dilemma is essential if this problem is to be surmounted [18–26].

Several factors may dissuade people from donating organs such as fear and prejudice, due to ignorance or simply to being misinformed [27–30]. Up to now, the message to support organ donation has been one based on altruism and solidarity [31,32]. However, despite numerous education campaigns targeting both the general population [17,32–35] and medical corps [36–39], the refusal rate of organ donation for transplantation remains unacceptably high, particularly among less educated populations. Many people do not yet readily accept that ‘using’ body parts when life ends is morally justified and does not violate moral precepts [23,36,38], although most religious institutions advocate organ donation after death for transplantation [40–46]. Understanding this dilemma is essential if this problem is to be surmounted.

Here, we report on the first international survey aimed at testing public knowledge of organ shortage in a biased sample of well-educated people that were likely to have benefited from previous transplantation information campaigns. A good level of knowledge would encourage existing programs to reach the general population, whereas a negative figure would justify changing the current strategy. We also questioned the respondents on their perception of new ideas for solving this public health issue.

Methods

Population

This survey was carried out by the co-authors and/or members of their staff using a ‘hand to hand’ questionnaire in their own institution, without a specific public forum and without providing the respondents with supplementary information. We targeted a biased population of well-educated people who were likely to have benefited from previous campaigns promoting transplantation, i.e. students and university staffs. People were approached with the first question (Do you know what organ shortage means?), and therefore each of the 2321 participants, 1492 in South America (Argentina and Brazil) and 829 in Europe (Austria, Italy, and France) replied to at least one question.

Questionnaire

The following questionnaire was translated in the respondents’ mother tongue (Spanish, French, Italian, Portuguese, and Austrian).

(1) Do you know what organ shortage means?

(2) If yes, do you believe this public health problem is: (a) Unimportant, (b) Important, (c) Very important, (d) Critical.

(3) Did you ever think that during our lifetimes we are more likely to be potential organ or tissue recipients than organ or tissue donors?

(4) Did you ever think that when our life ends our organs might become a unique source of life that is useful to everyone?

(5) Do you think the following religions are for or against the use of organs and tissues for transplantation: (a) Catholicism, (b) Protestantism, (c) Judaism, (d) Islam, (e) Buddhism.

(6) If you acknowledge that organ shortage is a public health issue, which of the following messages would be the most appropriate to help solve it? (a) Organ donation is a gift of life and a chance to save another person. (b) Allowing organ usage when life ends signifies that the society allows that we share a unique source of health among all people.

(7) Some people consider that a legal financial support to the donor’s family may be helpful to improve organ donation. Do you think this would be: (a) Helpful, (b) Not helpful, (c) No opinion, (d) Open remarks. (a) Ethical, (b) Unethical, (c) No opinion, (d) Open remarks.

(8) Do you believe that people could agree that using body parts after death is acceptable and should be considered as an implicit contract based on knowledge and understanding? (a) Yes, (b) No, (c) Maybe, (d) Don’t know, (e) Other opinion.

(9) Do you think that these notions pedagogically matched to each age should be taught to children and adolescents in schools? (a) Yes, (b) No, (c) Other opinion.

(10) Personal description: age, study level, income.

Statistical analysis

The chi-squared test was used to analyze the differences between the replies to each variable between individuals grouped in both surveyed regions (Europe and Latin America). When the overall chi-square showed a *P*-value of <0.05, the adjusted residuals were calculated in order to evaluate the contribution of each cell to the global chi-squared value for any single variable. The Shapiro-Wilk test was carried out to demonstrate whether the variable ‘age’ was normally distributed. The Wilcoxon–Mann–Whitney test was performed to evaluate the difference between the age of the European and Latin-American respondents. Similarly, the nonparametric Kruskal–Wallis ANOVA with Bonferroni multiple comparison test was performed to evaluate the differences in age for the five groups of respondents from the different countries. In a separate analysis, categorical variables were transformed

into an ordinal scale (whenever possible) and an exploratory factor analysis was carried out in order to define the presence of clearly defined subgroups of variables.

Results

Description of the population

About 2321 people were approached to participate in this survey and replied to at least one question. 1492 (64.3%) lived in South America and 829 (35.7%) in Europe. In South America, the mean age of the respondent was 29 years (range: 15–74), the male/female sex ratio was 44/56, and the education level was high (primary <1%, secondary 10%, university 90%). 92% of the people described their incomes as sufficient, 4% as high, and only 4% as insufficient. In Europe, the mean age of the respondent was 30 years (range: 15–78), the male/female sex ratio was 47/53, and the educational level was also high (primary 1%, secondary 54%, university 45%). All described their incomes as sufficient. There was no difference in age distribution between Italy (mean age 32.9 years), Argentina (32.1) and France (31.5), but mean age was statistically lower in Brazil (27.9) and Austria (24.0; $P < 0.05$).

Awareness of the organ shortage and personal feelings about organ transplantation

The vast majority of the respondents said they were aware of the problem of organ shortage: 92.7% (94.0% in Europe and 92.0% in South America). Three respondents (0.13%) did not reply to this question, but accepted to answer to at least another one. Only 8.9% of the total population (7.7% in South America and 11.0% in Europe) defined organ shortage as an unimportant public health issue. 29.6% ranked organ shortage as a very important issue (30.2% in South America and 28.6% in Europe) and 27.0% even defined it as a critical issue (34.1% in South America and 14.4% in Europe). Therefore, South American respondents considered the burden of organ shortage significantly more severe than the European respondents ($P < 0.05$; Table 1).

Table 1. Importance of organ shortage as a public health issue.

	South America	Europe	Total
No answer	124 (8.3%)	36 (4.3%)	160 (6.9%)
Unimportant	115 (7.7%)	91 (11.0%)	206 (8.9%)
Important	294 (19.7%)	346 (41.7%)	640 (27.6%)
Very important	451 (30.2%)	237 (28.6%)	688 (29.6%)
Critical	508 (34.1%)	119 (14.4%)	627 (27.0%)

About 66.5% of the total population agreed that we are more likely to be potential organ or tissue recipients than organ or tissue donors (68.8% in South America and 62.5% in Europe). Only five people (0.22%) did not reply.

When respondents were then asked if they consider organ transplantation as a unique and very useful tool in health care, 94.4% of the total population agreed (93.7% in South America and 95.6% in Europe). Only 2.4% disagreed and 3.2% did not answer or said they did not know.

Knowledge of religious precepts

In these five traditionally Catholic countries, only 47.1% of the population tested knows that the Catholic Church is in favour of organ transplantation (45.2% in South America and 50.4% in Europe; Table 2). A minority thought that the Protestant Churches allowed organ transplantation (24.1% in the total population and only 14.0% in South America). Very few people thought that the Judaism (15.4%) and Buddhism (17.3%) allow transplantation. The replies concerning the Islamic religion produced the lowest percentages: 4.1% thought transplantation was allowed (only 2.2% in South America; Table 2).

Table 2. Knowledge of religious precepts.

	South America	Europe	Total
Catholic			
Accept	675 (45.2%)	418 (50.4%)	1093 (47.1%)
Refuse	21 (1.4%)	125 (15.1%)	146 (6.3%)
Don't know	483 (32.4%)	251 (30.3%)	734 (31.6%)
No answer	313 (21.0%)	35 (4.2%)	348 (15.0%)
Protestant			
Accept	209 (14.0%)	350 (42.2%)	559 (24.1%)
Refuse	46 (3.1%)	116 (14.0%)	162 (7.0%)
Don't know	819 (54.9%)	318 (38.4%)	1137 (49.0%)
No answer	418 (28.0%)	45 (5.4%)	463 (19.9%)
Jewish			
Accept	169 (11.3%)	188 (22.7%)	357 (15.4%)
Refuse	67 (4.5%)	253 (30.5%)	320 (13.8%)
Don't know	836 (56.0%)	330 (39.8%)	1166 (50.2%)
No answer	420 (28.2%)	58 (7.0%)	478 (20.6%)
Islamic			
Accept	33 (2.2%)	63 (7.6%)	96 (4.1%)
Refuse	96 (6.4%)	388 (46.8%)	484 (20.9%)
Don't know	937 (62.8%)	321 (38.7%)	1258 (54.2%)
No answer	426 (28.6%)	57 (6.9%)	483 (20.8%)
Buddhist			
Accept	228 (15.3%)	173 (20.9%)	401 (17.3%)
Refuse	132 (8.8%)	245 (29.6%)	377 (16.2%)
Don't know	969 (65.0%)	346 (41.7%)	1315 (56.7%)
No answer	163 (10.9%)	65 (7.8%)	228 (9.8%)

Table 3. Gift versus share of organ after death.

	South America	Europe	Total
Gift	849 (56.9%)	608 (73.3%)	1457 (62.8%)
Share	464 (31.1%)	199 (24.0%)	663 (28.5%)
Both	0 (0%)	9 (1.1%)	9 (0.4%)
No answer	179 (12.0%)	13 (1.6%)	192 (8.3%)

How can this problem be solved?

The majority of the population tested considered organ donation as a gift (62.8% in the total population) and not just a matter of sharing body parts. Europeans were even more attached to this concept (73.3%) than South Americans (56.9%) ($P < 0.05$; Table 3).

Very few people thought it would be helpful to provide financial support to donors or the family of deceased donors (24.9% of the total population); this was even more so the case in South America (18.2%) than in Europe (37.0%; $P < 0.05$). However, only 44.4% stated it would not be helpful (53.1% in South America vs. 28.8% in Europe, $P < 0.05$), as a large proportion of the respondents held no opinion or did not answer this question (Table 4a). However, the majority thought this financial support would be unethical (51.0%). Only 19.3% of the population thought this proposal would be ethical (22.9% in South America and only 13.0% in Europe, $P < 0.05$;

Table 4. Agreement with new initiatives.

	South America	Europe	Total
(a) Financial support for the family of the deceased donor			
Convenient	271 (18.2%)	307 (37.0%)	578 (24.9%)
Inconvenient	792 (53.1%)	239 (28.8%)	1031 (44.4%)
Don't know	187 (12.5%)	174 (21.0%)	361 (15.6%)
Other Opinion	104 (7.0%)	93 (11.2%)	197 (8.5%)
No answer	138 (9.2%)	16 (1.9%)	154 (6.6%)
Ethical	341 (22.9%)	108 (13.0%)	449 (19.3%)
Unethical	752 (50.4%)	431 (52.0%)	1183 (51.0%)
Don't know	258 (17.3%)	189 (22.8%)	447 (19.3%)
Other opinion	108 (7.2%)	55 (6.6%)	163 (7.0%)
No answer	33 (2.2%)	46 (5.6%)	79 (3.4%)
(b) Agreement with organ sharing after death			
Yes	1051 (70.4%)	456 (55.0%)	1507 (64.9%)
No	76 (5.1%)	69 (8.3%)	145 (6.3%)
Perhaps	298 (20.0%)	167 (20.2%)	465 (20.0%)
Don't know	41 (2.7%)	107 (12.9%)	148 (6.4%)
Other opinion	16 (1.1%)	15 (1.8%)	31 (1.3%)
No answer	10 (0.7%)	15 (1.8%)	25 (1.1%)
(c) Agreement with educational programs targeting children at school			
Yes	1338 (89.7%)	608 (73.3%)	1946 (83.8%)
No	78 (5.2%)	137 (16.5%)	215 (9.3%)
Don't know	64 (4.3%)	62 (7.5%)	126 (5.4%)
No answer	12 (0.8%)	22 (2.7%)	34 (1.5%)

Table 4a). Most people who said they had 'another opinion' were also apprehensive of the risk of an organ trade, but some requested additional information on the way it could be organized.

The majority of respondents stated they would be ready to assume sharing organs after death as an implicit social contract (64.9% of the total population), and even more so in South America (70.4%) than in Europe (55.0%; $P < 0.05$). Only 6.3% did not find this acceptable (5.1% in South America and 8.3% in Europe; Table 4b). 27.5% had no fixed ideas on this matter: 20.0% said it could perhaps be acceptable and 7.5% did not know or did not answer the question (Table 4b). The 'other opinions' reflected a fear that there would be a loss of respect for human dignity and expressed the need for strict legal restrictions.

The majority of the people thought that educational programs could target children at school and colleges (83.8% of the total population). Agreement was stronger in South America (89.7%) than in Europe (73.4%, $P < 0.05$). Only 9.3% would not like children to be exposed to such programs, more frequently in Europe (16.5%) than in South America (5.2%, $P < 0.05$; Table 4c).

Factors predicting the type of reply

Knowledge of the religious precepts correlated with a disagreement for financial support to donors ($P = 0.001$) and an agreement for organ sharing after death ($P = 0.001$). People who knew the religious precepts also graded organ shortage as a more severe public health burden ($P < 0.001$). There was also a trend for these people to favour targeted educational programs on transplantation at school ($P = 0.001$). There was also a significant association between rejection of financial support to donors and agreement for organ sharing as well as early educational programs ($P = 0.03$).

Discussion

This biased sample of well-educated people from South America and Europe that participated in this international survey seemed to be aware of the problem of organ shortage, and graded this public health issue as serious and even critical (in South America). In fact, the first two questions were designed to determine whether the respondents were ready to accept that organ shortage is indeed a 'public health issue', and not whether they knew this beforehand. Very few people were unaware of the meaning of 'organ shortage', but this does not mean that they were already aware of this problem. Indeed, the second question required the respondent to grade what

was immediately referred to as a 'public health issue'. Similarly, these people realized that we are more likely to be potential organ or tissue recipients than organ or tissue donors at the time this question was asked, but this certainly was not the case beforehand. The vast majority of participants were favourable to the principle of organ transplantation. Therefore, the first part of our questionnaire painted an encouraging picture of the general feelings of well-educated people toward the problem of organ shortage for transplantation if a minimum amount of information on the issue is provided.

There is a disastrously low level of knowledge of religious precepts by these well-educated people from five countries which are thought to be deeply impregnated with Christian culture. 46.6% did not know or did not reply to the question concerning the precepts of the Catholic Church. With a further 6.3% of people believing that the Catholic religion does not accept organ transplantation, the majority did not realize that organ donation after death is in fact highly recommended by the Catholic Church. The prejudices concerning the precepts of the other religions are even more catastrophic, with the worst figures applying to the precepts of Islamic beliefs, and of any religion in South America compared with Europe. Moreover, the ignorance of religious precepts was correlated with a low acceptance rate of the principle of organ sharing after death. In fact, most Church leaders advocate organ donation after death for transplantation, with the only exception being that Muslim jurists from the Arab world support organ transplantation, but those from the Indian subcontinent are against it [44]. Further studies will need to specifically assess the level of knowledge of religious precepts in populations of regular churchgoers, albeit minorities nowadays in our westernized countries.

The burden of organ shortage has recently led to two highly controversial proposals: free usage of organ after death regardless of the family's feelings [14] and financial rewards for donors or families of deceased persons [10,11]. The majority of the people still preferred to define organ donation as a gift and not a sharing of body parts. This emphasizes the strong feelings of the population that body integrity should be respected even after death and proves that it would be difficult to rapidly implement a radical change in the regulation of organ donation. However, after discussing the financial reward for organ donation, people were asked more specifically if they would be ready to assume that sharing organs after death could be a fair consensus of opinion in our societies. A majority supported the concept that the use of organs after death may be an individual responsibility toward the society, particularly in South America. It is encouraging to realize that this question on a new idea obtained one

of the highest response rates of this survey, suggesting that there is a favourable background for educational programs that would try to overcome the current barriers concerning usage of body organs.

Financial incentives were considered helpful to solve organ shortage by a minority of the population (24.9%), and an even lower proportion found this proposal ethical (19.3% of the total population and only 13.0% in Europe). Nevertheless, only a small majority (51.0%) considered this incentive as truly unethical as 29.7% had no strong feelings on this matter, which suggests there may still be room for debate. However, the better educated people who are familiar with the religious precepts are more likely to disagree with the principle of financial rewards, but to accept sharing organs after death and to support early educational programs on transplantation at school.

The less controversial proposal was transplantation educational programs targeting children in schools. As expected, a large majority was favourable, but 9.3% were opposed and 6.9% had no idea whether educational programs could be appropriately tailored to children. This emphasizes the need for educational programs targeting adults so as to end the trauma attached to transplantation (and death). The goal of such programs would be that organ sharing after death obtains the mindful, social and ethical approval of our societies [32,35]. A recent poll among transplant specialists showed a significant agreement with these proposals [35].

In conclusion, a biased panel of well-educated people likely to have benefited from previous transplantation educational programs was ready to accept that organ shortage is a serious public health issue and that transplantation is a useful tool for health care. Although people are currently still considering organ donation as a gift, they may be ready for a shift toward more readily sharing organs after death. Financial rewards for donors or families of deceased persons are still a subject of controversy. These adults agreed with the principle of early transplantation educational program directed toward children at school. However, the widespread ignorance of religious precepts was correlated with a low acceptance rate of the principle of organ sharing after death. Therefore, we suggest that Church leaders should be included in a Task force with representatives of WHO and UNESCO to combine efforts so as to engineer a comprehensive international educational program targeting not only adults, but also children.

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