

# Assessment of knowledge and attitudes of university students from Szczecin to problems associated with transplantation

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## ABSTRACT

**Introduction:** Organ transplantation is the best and only method of treatment for patients with terminal organ failure. However, the number of donors is still insufficient. It is thus advisable to take action to eliminate the stereotypes concerning transplantation. The aim of the study was to get to know the opinions of the students of higher education institutions in Szczecin on the topic of organ donation and social barriers in transplantology.

**Materials and methods:** The research was conducted in 2010–2013 and was comprised of 1,400 students (864 women – 61.7% and 536 men – 38.3%). The average age of the participants was 21.6 years. The Questionnaire about Organ Donation and Transplantation was used as a research tool.

**Results:** The students generally approve of transplantology and most of them would like to be an organ donor (almost 84%). Medical university students more frequently declare having a knowledge of transplantology (73%), express their willingness to donate organs (87%) and accept xenotransplantation (74%). Female students declare their intention to donate organs more

often than male students (68% vs 57% in males) and to receive an organ donation (66% vs 56% in males).

**Conclusions:** There was a diverse degree of acceptance of organ donation depending on the respondents' sex and subject of study. Medical students demonstrated the highest degree of understanding of the issue. The likelihood of acceptance changed depending on the respondent's sex, women have a more understanding approach to the issue of transplantation and declare a willingness to become a donor more frequently than men. The majority of students wanted to donate their organs after death, especially to their own family members. Values derived from their background and the acceptance of transplantation by the mother are the most significant factors affecting one's willingness to donate organs. Television is the main source of information about transplantation. Thus it is particularly important to conduct campaigns promoting transplantation in the media.

**Keywords:** organ transplantation; organ donors; xenotransplantation.

## INTRODUCTION

The development of transplantology, the increase in the number of transplanted organs, the improvement of surgical techniques, and the modernization of immunosuppressive regimens has meant that there is a growing imbalance between the need for organ transplantation, and the availability of organs [1, 2, 3, 4]. A prolonged waiting time for an operation usually results in the deterioration of the patient's condition and can lead to fatality. For this reason, transplantation is the only option for those who have exhausted all other therapeutic options [4, 5]. An analysis of data from the National Transplant Waiting List from the last few years shows that the number of patients waiting for a vascularised organ transplant has remained stable and amounts to about 2,600 people per year (2,565 people in 2013). However, an increasing shortage of organs means that new ways of obtaining them must be found [6]. Public opinion polls concerning organ transplants have been conducted in Poland for several years. Many respondents have set views on this issue and the overall acceptance of organ transplants in Poland is high. In reality however, procurement of organs from deceased donors (*ex mortuo*) is uncommon largely

due to the objections of the potential donors' families or the manipulation of public opinion [7]. Organ transplants from living donors (*ex vivo*) are still rare in Poland. This situation provokes reflection on the future of transplantology which relies on the activity of transplantation facilities as well as genuine social support and involvement. Thanks to the results of public opinion polls, it is evident which aspects of organ transplantation are unclear to the public, which are frowned upon, and which are commonly accepted. Based on the above factors, it seems important to get to know the opinions, views and knowledge of university students on the issues connected with transplantology. Another important reason for conducting research among students in this location was the fact that the West Pomeranian Voivodeship has had the highest rate of procurement of organs from deceased donors in the country for the last several years. The number of procurements in 2013, amounting to 25.9 donors per 1 million citizens, put the West Pomeranian Voivodeship in the topmost active regions [8].

The aim of this study was to get to know the opinions of students from the 4 biggest universities in Szczecin and to identify their attitudes concerning the issues of organ and tissue transplants.

The study attempted to answer the following questions:

1. Does the respondents' major affect their level of knowledge of organ donation?
2. Is there a difference in the degree of acceptance of organ transplants among the respondents based on their sex?
3. Are the respondents willing to become organ donors after death?
4. Do the respondents accept organ transplants within their own family?
5. What reliable sources do the respondents derive their knowledge of organ donation and transplantology from?

## MATERIALS AND METHODS

The study was conducted between December 2010 and June 2013 among the students at the following universities: Pomeranian Medical University in Szczecin (PMU), West Pomeranian University of Technology in Szczecin (WPUT), University of Szczecin (US) and the Maritime University of Szczecin (MU). The respondents were selected randomly from students of all years. It was assumed that the study groups represented 3 different scientific fields – medical sciences, humanities and technical sciences. A diagnostic poll was used in the study and the research tool was a Polish version of the standardized Questionnaire about Organ Donation and Transplantation (University students). This is comprised of 45 close-ended questions. The tool was obtained and shared in Polish by the University of Murcia. The respondents were informed of the aim of the study, that they would remain anonymous, and how to complete the questionnaire.

### Characteristics of examined group

The study was conducted among 1,400 students – 864 women (61.7%) and 536 (38.3%) men. The number of medical students amounted to 389 (27.8%). However, only a tenth of these respondents were undergoing a purely medical education at the faculty of medicine. There were 1,011 (72.2%) non-medical students. The most common groups among the respondents were the students of the Faculty of Navigation at MU – 329 participants (23.5%), and the students of the Faculty of Humanities at the US – 177 respondents (12.6%). The least common groups were the students of the Faculty of Philology of the US – 25 participants (1.8%) and the students of Emergency Medicine from the Faculty of Health Sciences at the PMU – 37 respondents (2.6%). Statistical analysis was performed using the Statistica 5.0 PL program.

## RESULTS

The results were obtained through a preliminary model of discriminant analysis for all analyzed variables. It involved all positive answers to the survey questions as well as available socio-demographic data. However, this overall model is not able to properly assess the impact of the chosen variables.

Eventually, only 15 variables that independently affect the willingness or refusal to donate organs after death were distinguished. The correctness of the final model of discriminant analysis was verified mathematically – Wilks's Lambda = 0.66925 F approx. (17.1381) = 40.147 ( $p < 0.00001$ ). Table 1 contains the positively verified data.

Table 1 contains the confirmed variables conditioning the acceptance of transplantology as well as showing the most significant doubts that people who are against organ transplants have. The overview shows that people who perceive organ donation as a moral obligation, have spoken to their friends about transplantology, whose mother supports organ donation as well as those who are not afraid of xenogenic transplantations would agree to a kidney transplant and are willing to donate their own organs after death. Doubts and concerns largely related to the integrity of the body after organ removal. Irrespective of the level of medical education, people are afraid of having their organs removed while they are still alive. Medical education, age and sex were not independent variables determining the acceptance or rejection of organ transplantation. Values inculcated in the process of personality development, upbringing, and education seem to be very important. Young people are often influenced by their family and peer group. An approval of organ transplants by the mother and a sense of moral obligation have the highest value in the lambda parameter (Tab. 1, column 2). Subject-matter knowledge does not seem to influence the willingness to donate organs.

## DISCUSSION

Transplantology is the most spectacular field of medicine and is increasingly successful despite a discrepancy between the number of transplants conducted and the number of patients awaiting a transplant. The issue of public awareness concerning transplantology is very important since the number of patients who have already exhausted all therapeutic options other than transplantation are dependent upon the willingness of others to donate organs or the organs of family members after death. Currently, there is a significant increase in the number of donors and the number of transplanted organs in Poland which indicates a recovery from the downturn in donation levels that lasted until 2007. In 2014, 1,575 transplants from deceased donors and 75 transplants from living donors were performed, totaling to 1,650 transplants [8]. Transplants from living donors still only constitute a small percentage of all transplants, not only in Poland but across Europe. This is confirmed by a study conducted in the United Kingdom and in the Republic of Ireland by Donnelly et al. who found that transplants from living donors amount to 0–25% of all transplants and that 60% of doctors opt for the extension of the program of living donations [9]. In countries with better results, the rate is over 50 pmp (number of donations per million population) [10]. Research conducted by Ghods in 2011 and 2012 for the Society for Organ Transplantation shows that Iran has one of the best rates of organ donation in the Middle East (37 pmp) [11].

**TABLE 1.** Overview of discriminant analysis of the variables independently linked to the willingness to donate organs after death

Analyzed independent variables distinguishing the respondents' willingness to donate organs after death	Lambda	Partial	F excluded	p-value	Tolerance	1-Tolerance
	Wilk's	Wilk's	1.1381			(R2)
Question 5. Willingness to become an organ donor	0.677154	0.988333	16.30213	<b>0.000057</b>	0.951588	0.048412
Question 7. Conversations with friends about donating organs	0.687434	0.973553	37.51609	<b>0.0000001</b>	0.919148	0.080852
Question 10. Reason for the willingness – sense of obligation	0.685660	0.976071	33.85559	<b>0.0000001</b>	0.952433	0.047567
Question 11. Lack of consent to interfere with a dead body	0.681800	0.981597	25.89105	<b>0.0000001</b>	0.949481	0.050519
Question 11. Fear that the organs will be taken prior to one's death	0.690533	0.969184	43.91025	<b>0.0000001</b>	0.974343	0.025657
Question 11. Religious reasons	0.672769	0.994775	7.25400	<b>0.007160</b>	0.972999	0.027001
Question 13. Fear of desecrating the body after death	0.680367	0.983666	22.93203	<b>0.000002</b>	0.957921	0.042079
Question 15. Mother's approval of organ donation	0.692144	0.966928	47.23409	<b>0.0000001</b>	0.928896	0.071104
Question 21. Social work as a volunteer	0.671282	0.996977	4.18715	<b>0.040921</b>	0.959674	0.040326
Question 22. Consent for family members' cremation	0.672332	0.995421	6.35283	<b>0.011831</b>	0.848803	0.151197
Question 28. Willingness to donate part of one's liver	0.672905	0.994573	7.53618	<b>0.006126</b>	0.923188	0.076812
Question 33. Being aware that the church supports organ donation	0.671264	0.997005	4.14912	<b>0.041847</b>	0.946517	0.053483
Question 43. Willingness to receive a kidney transplant	0.674966	0.991537	11.78720	<b>0.000614</b>	0.936052	0.063948
Question 44. Belief that xenotransplantation is not risky	0.672127	0.995724	5.93040	<b>0.015008</b>	0.982901	0.017099
Question 45. Belief that xenotransplantation may change the personality of the transplant recipient	0.673658	0.993462	9.08878	<b>0.002619</b>	0.985252	0.014748

Correctly verified final model of discriminant analysis with Wilk's Lambda: 0.66925, approx.  $F(17;1381) = 40.147$   $p < 0.00001$

In the last decade, there were numerous attempts to study public opinion on organ transplantation in Poland and abroad in order to identify social barriers relating to this method of treatment. According to a 2012 study by the Public Opinion Research Centre, the vast majority of Poles present a positive attitude towards *ex mortuo* transplantation and the level of approval is higher among young and highly educated people. The study shows that 74% of the respondents accept *ex mortuo* transplantation and every seventh respondent (15%) is against it [7].

The analysis in this research paper shows that there is a high level of willingness to donate organs, especially in the group of students in medical school (87%). This data corresponds with the results of a study conducted in 2010–2011 in Pakistan at the Ziauddin Medical University in Karachi. Most medical students (almost 90%), both male and female, want to donate their organs, which once again confirms the results of this research paper [12]. In 2014, in India, Ramadurg and Gupta conducted an interesting study among medical students concerning the effect of education on the increase in knowledge of organ donation and attitudes towards it. The research was

conducted among 70 students – 50% female and 50% male. The most frequent reason for wanting to donate one's organs was to save human lives (87%) [13]. This significantly overlaps with the results of this research paper.

It follows from the presented studies that the main source of information about organ donation is the media. The authors' own research shows that, for the vast majority of young people, the main sources of information regarding transplantology are television, radio, press and Internet. This is confirmed by a study Ali et al., for medical students, the main sources of information regarding transplants are via electronic devices (64.6%), friends and family (50%), the press (42.4%), lectures and seminars (32.9%), and healthcare professionals (28%) [12].

After analyzing the data from the authors' own research, it seems that there are numerous groups of young people that are willing to donate organs. Although only half of the respondents had been informed of the possibility to donate organs, over 80% of the participants, irrespective of their sex and education, are willing to become organ donors. Most of them are in favor of transplantation and only 6% of the respondents think it is terrifying and wrong. Coad et al. have analyzed the attitudes to transplantation among 119 young British people.

Most of them were in favor of organ donation although few had signed up to the organ donation register [14]. It is crucial to encourage people to communicate their views on being an organ donor to their kin which, in most cases, would help the family understand their wishes in terms of organ donation once they are deceased. According to Dutch doctors, nurses and donor coordinators employed in intensive care units, should dedicate more time to the families of potential donors in order to ease the task of making the decision and possibly gaining consent for organ procurement [15]. Shaw [16] and Rodrigue et al. [17] have made similar observations. Foss et al. attempted to answer the question: "Does the knowledge and the attitudes of the medical staff affect the process of donation?". Among 435 Norwegian doctors, 62% confirmed the significant effect of education on maximizing the number of donors [18].

However, the purpose of this research paper is to analyze the factors influencing the approval or disapproval of transplantation. While comparing the obtained results, it seems that the respondents' sex is significant, at least in the preliminary assessment. Women are more emotional and cautious and do not take risks as easily as men. For this reason, their approach towards transplantation seems to be more deliberate and planned. This is reflected in their aspiration for expanding their knowledge in this matter. Women seek information in the mass media more frequently than men (79.5% and 68.8%, respectively). Women are more likely to talk about the problem, including analyzing the reasons for feeling reluctant towards transplantation. They also express their will to donate organs more often than men (68.7% and 57%, respectively). One's upbringing and the worldview of one's parents (especially the mother) seem to affect women's behavior more. Pragmatic discussions with parents and the parents' views seem to be significant factors in the acceptance of organ donations which is confirmed by an online survey conducted by Siebielnik et al. among 1,146 respondents. They also found that the issue of organ donation was discussed with a partner by 84% of the respondents, whereas only 46.5% talked about it with their child [19]. The study mentioned above is consistent with the data collected by the authors of this paper. Young men are more expansive by nature and give the impression that they do not worry about their future health needs. While preparing to fulfill the obligations imposed by the traditional social model (i.e., being the main breadwinner), they are not willing to risk their health by donating their own organs (77%).

The effect of medical education on the transplantological awareness of youth is also of great importance. Medical professionals are a critical link in expanding society's knowledge and awareness regarding organ donation as their attitudes and views may have a significant effect on public opinion. In a study conducted on medical students in southern India, 97% of the respondents were aware of organ donation, 89% wanted to be an organ donor, 69% were willing to donate their organs to their family members, 77% objected to desecrating the body after death, and, surprisingly, only 23% of the respondents clearly understood the concept of brain death [20]. The authors' own research confirms the above results, with the exception that

over 95% of the surveyed medical students understand the concept of brain death.

Despite the considerable size of the research group (1,400 people), this study does not reflect the level of knowledge of the whole population due to the respondents' young age and the fact that a significant proportion of the group are currently studying medicine (almost 30%). This considerably limits the study. However, it is worth emphasizing that the study applies to a generation of people who are just entering their adult lives, who are open to new challenges, and who are actively using digital media. For this reason, the results of the conducted survey may be predictive of the next 20–40 years when the respondents, being the social elite, will act in accordance with their beliefs and, at the same time, may become recipients of transplants. Research published by Eurobarometer in 2010 shows that the overall level of Polish society's knowledge of transplantology is unsatisfactory. Of the states in the European Union, Poland ranks 14th in terms of knowledge of legal regulations concerning organ donation and transplant [21]. It is therefore necessary to promote organ donation through carefully planned educational campaigns, inform the public about the benefits of transplantology, and deal with damaging stereotypes with the use of modern means of communication.

## CONCLUSIONS

1. The degree of acceptance of organ donation varies among the researched youth depending on the type of studies they are undertaking. Medical students demonstrated the highest level of understanding of the issue.
2. Transplantation as a method of saving people's lives is commonly accepted by young Poles. However, the level of acceptance varies depending on the respondents' sex. Women's attitude towards the issue of transplantation is more positive and they are willing to become an organ donor more frequently than men.
3. Most students are willing to donate their organs after death, especially to their own family members. The values derived from their upbringing as well as a mother who accepts organ donation are the strongest factors contributing to their willingness to be an organ donor.
4. Television is the main source of information about transplantology. For this reason, it is important to conduct campaigns promoting the idea of transplantology in all media, especially on the Internet, since it is commonly used by young people.

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