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Consciousness of the vital role of transplantology among citizens of Polish small towns

Abstract

Transplantology in Poland has faced challenges in recent years, marked by a decline in organ donation rates. From 2016 to 2020, the organ donation ratio decreased from 14 to 10 donors per million inhabitants. Although a slight increase to 11.8 was observed in 2022, there remains a shortage in organ procurement. This study investigates society's knowledge and attitudes towards organ donation, focusing on small towns where literature on transplantology is limited. A survey was conducted among 100 patients in Ryglice and Zalasowa, southeastern Poland. Analysis of demographic data revealed correlations between gender, education level, and certain aspects of transplantology knowledge. Women with higher education exhibited greater awareness and willingness to become living donors. However, the study found no correlation between age groups and transplantology knowledge. Despite technological advancements in transplantology, the study emphasizes the importance of health education, particularly in rural areas, to address the knowledge gap and foster a culture of organ donation. Strategies to increase awareness, especially among younger generations, and improve legislative measures are proposed. The study also highlights the potential of digital platforms for information dissemination and suggests statistical extrapolation to estimate the potential donor pool in rural areas. Overall, addressing these challenges is crucial for building a robust organ donation system and improving public health in Poland.

Keywords: Tissue and Organ Procurement Living Donors, Poland, Health Education, Public Health.

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INTRODUCTION

Transplantology in Poland has faced hard times in recent years, with a gradual decline in organ donation ratio (i.e. number of real donors per 1 million of inhabitants). The very start of descent was observed from 2016 with organ donation ratio 14 to year 2020 with ratio 10 [1]. According to the Global Observatory on Donation and Transplantation statistics, the ratio in 2021 remained low at 10.5 [2]. However, there is a promise, as there was an increase in 2022 with a ratio of 11.8 [3]. With no doubt, there has been a shortage in organ procurement over the last 5 years. Alongside the downward trend, it is crucial to assess society's attitude toward organ donation.

Regarding rather limited information in the literature about present society's knowledge on transplantology, especially among the small-townpopulations, the results may provide valuable information to extrapolate the number of potential living organ donors.Additionally, they may indicate which aspects of transplantology should be explained to a broader population.

MATERIAL AND METHODS

Participants

The research included one hundred randomly selected patients visiting two local General Physicians'clinics in Ryglice and Zalasowa in November 2023. The location is in the southeastern part of Poland, precisely Lesser Poland voivodeship, Tarnów county, Ryglice commune. Among all respondents there were men (N=25) and women (N=75). Age was divided into four groups: <19 (N=2), 20-29 (N=10), 30-39 (N=26), 40-49 (N=26), 50-59 (N=15), >60 (N=21).

The respondents were also to choose the population size of the city they live in, accordingly four groups were made: <2000 (N=39), 2000-20 000 (N=49), 20 000-100 000 (N=4), >100 000 (N=8).Moreover, question about education level was given, distinguishing: primary (N=4), secondary (N=38),vocational (N=28) and higher (N=30) education.

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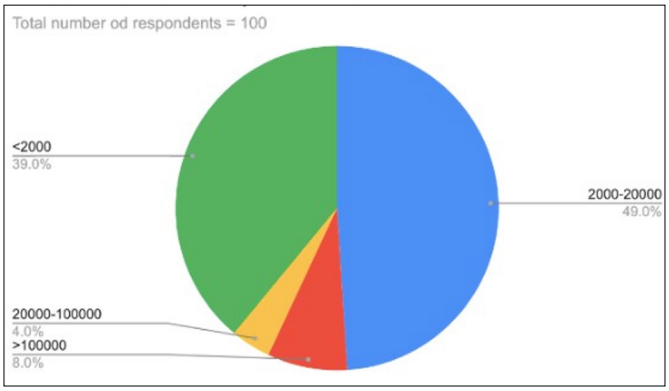

FIGURE 1. Citizens number in respondents cities.

Additionally, questions about the faith of respondents were included. The following results were obtained: Catholic (N=96), Atheist (N=0), Jehovah's witness (N=0) and Other (N=4).

The respondents from towns with populations of 20 000-100 000 and >100 000 were excluded from further analysis which is explained by our statement of investigating citizens of small towns. Small towns are defined by population under 20 000 [4]. That situation reduces our group to 88 participants.

Methods

The methodology involves distributing four-page, single-choice survey papers with short introduction and research description at the top of the first page to the respondents. Eighteen (N=18) questions were stated with 2 to 8 possible answers, varying between questions. After collection and storing in folders, papers were assigned unique codes. In this particular situation from T001 to T100, what gave the possibility to transcribe data onto Google Sheets.

Every variable was assigned actual answers selected by respondents, which were alongside transcoded to numericals. Charts were drawn based on the variables present in the research data sheets. Descriptive statistics were used to visualize data in the form of graphs. Chi square tests were performed using GraphPad Prism version Version 10.2.1 for MacOS, GraphPad Software, Boston, Massachusetts USA, www.graphpad.com. For numeric variables, the mean value was calculated and the frequency of correct answers was given.

Procedure

Survey papers were distributed in previously mentioned GP local clinics in the waiting rooms. Each paper was given in paper along with a short description of the survey research mentioning the full anonymity and voluntariness. Additionally, quick instructions on proper answer marking were given; every doubted selection was consulted with the respondent and asked to be corrected.

Respondents were selected randomly based on the will of partaking in the survey. Every participant was assisted by the pollster in case of any question. However, every effort has been made not to suggest the answer. Completed survey papers were collected by the pollster and stored in a folder. Further steps have been already described under methods subsection.

RESULTS

The survey primarily was to check the actual society's knowledge on transplantology. Respondents rated subjectively their level of familiarity with the topic on scale from 1 to 10 (N=88, Mean=5.38). Next questions up to number 18 present the following results (number of respondents = 88):

TABLE 1. Collection of answers given to each question.

No.	The question	Correct answers	Incorrect answers
1.	How do you rate your knowledge on organ transplantation from 1 to 10?	1 pt (N=2) 2 pts (N=6) 3 pts (N=7) 4 pts (N=12) 5 pts (N=25) 6 pts (N=13) 7 pts (N=9) 8 pts (N=7) 9 pts (N=2) 10 pts (N = 5)	
2.	What is transplantation?	N=64	N=24
3.	What organ is most often transplanted in Poland?	N=47	N=41
4.	Can only a deceased person be an organ donor?	N=76	N=12
5.	Have you ever heard of being a living organ donor?	N=77	N=11
6.	What organ can be collected from a living donor?	N=43	N=45
7.	To become a donor you have to:	N=48	N=40
8.	What is the declaration of will?	N=18	N=70
9.	What is the presumed consent?	N=32	N=56
10.	What illness disqualifies you from being an organ donor?	N=57	N=31
11.	Are you an organ recipient?	Yes=2	No=86
12.	Are you an organ donor?	Yes=3	No=85
13.	Are you willing to become a living organ donor for an unknown person, knowing it will be life-saving?	Yes=57	No=31
14.	Are you willing to become a living organ donor for a loved one/relative, knowing it will be life-saving?	Yes=76	No=12
15.	Is there a sufficient amount of transplantation operations in Poland?	Yes=0	No=88
16.	Most often reason of family's objection to organ harvesting is:	Emotional bond with the deceased (N=16) Fear of disconnecting the patient from life support equipment (N=20) Fear of body disfigurement (N=5) Fear of unfair use of harvested organs (N=7) Religious beliefs (N=7)Other (N=4)	
17.	What is your knowledge source on transplantology	TV (N=30) Internet (N=43) School/University (N=6) Job (N=5) Popular science magazine (N=4)	
18.	Does the Polish society need transplantology education?	Yes=85	No=3

Chi-squared test indicated no relation of respondents'age with any question ($p>0.05$).

Sex had relation with question no. 5 (Chi-square = 4.23, $p<0.05$) and no. 13 (Chi-square = 5.46, $p<0.05$)

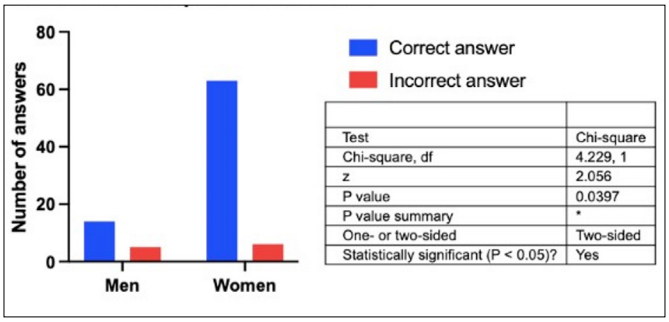

FIGURE 2. Sex relation with question number 5.

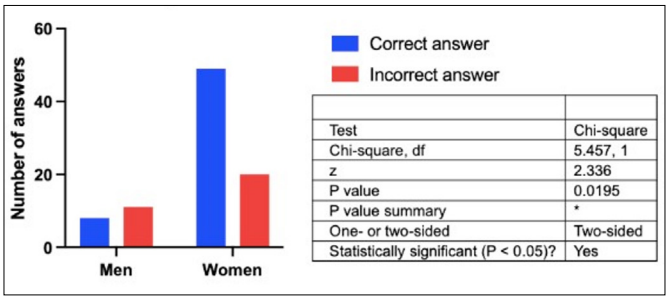

FIGURE 3. Sex relation with question number 13.

Also education level had relation with questions no. 3 (Chi-square = 7.91, p<0.05), no. 2 (Chi-square = 8.24, p<0.05 (0.0413)) and no. 7 (Chi-square = 11.80, p<0.05 (0.0081))

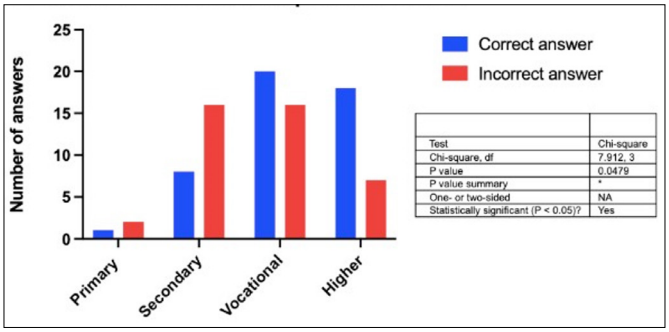

FIGURE 4. Education level relation with question number 3.

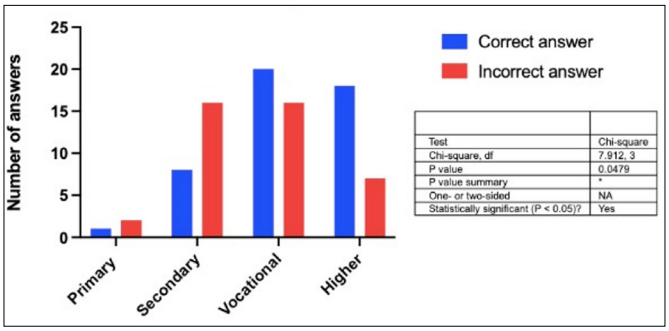

FIGURE 5. Education level relation with question number 2.

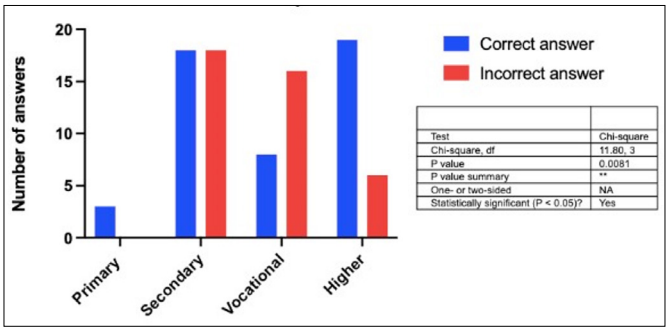

FIGURE 6. Education level relation with question number 7.

Sex does not have any relation with overall correct answers given in the survey (p=0.0502),however women had the higher frequency of correct answers (60.06%) than men (51.74%).

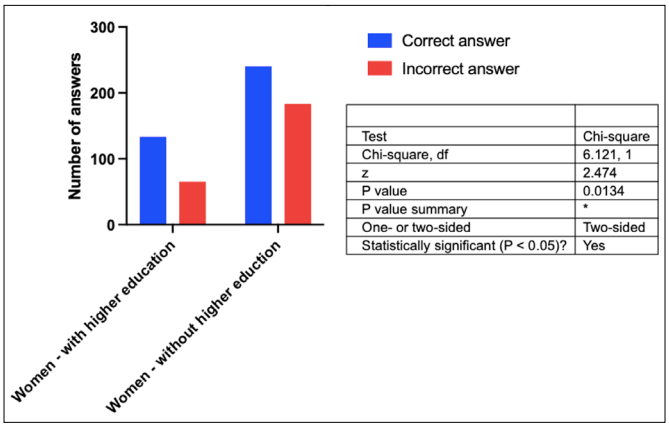

FIGURE 7. Relation of women's education with given answers.

DISCUSSION

History of transplantology and first steps in Poland

Looking back over the course of time at how transplantology has evolved, from ancient times when the first skin grafts were mentioned in the Ebers Papyrus in 1500 BC, to tales of Saint Cosmas, who, with the help of angels, performed a leg transplant on a patient with gangrene in the limb [5,6].This field has evolved over centuries, acquiring new achievements – the first fully medical skin grafts to treat wounds were performed in 1869 in Switzerland by Jaques-Louis Reverdin[7].

Step by step, it ventured into exchanging deeper organs, such as the first successful kidney transplant carried out in the 1950s by Dr. Murray [5]. Soon after, in 1966, Professor Jan Nielubowicz and his team (Waldemar Olszewski, Jerzy Szczerbań, and Wojciech Rowiński) performed the first kidney transplant in Poland, after which the patient lived for 6 months; unfortunately, he later died of acute pancreatitis [8].

Dr. Olszewski did not stop at this success because six years later, he presented the first scientific mentions of liver transplantation in Polish medicine to the world. It was only 15 years later that the first attempts at transplanting this organ took place in 1987 in Szczecin by Stefan Zieliński and in Katowice by Marian Pardela. The successful transplant was performed by Piotr Kaliciński at the Children's Health Institute in Warsaw [9].

In the meantime, a milestone in the development of Polish transplantology was the first bone marrow transplants, which eventually became one of the main lines of therapy for leukemias. They were performed in the 1980s, the first allogeneic transplant in 1983 at the Central Clinical Hospital of the Medical University of Warsaw, along with subsequent autologous transplantation. In the following decade, in Katowice at the Hematology and Bone Marrow Transplantation Department, the first transplants from an unrelated donor were performed [10].

An event that left an exceptional mark on the page of Polish medical history was dr. Moll's attempt to transplant a heart in 1969, while what permanently etched itself in the consciousness of Poles was the first heart transplant performed by Religa in 1985 [11,12].

New possibilities

All the above breakthroughs in the development of transplantology have provided a significant foundation for the ongoing advancement of medicine to this day. Despite increasingly newer methods, unfortunately, it is currently impossible without a sufficiently large number of potential donors to procure these organs. Due to organ donor shortage and donors gradually developing diseases that will exclude them, new technologies are emerging to improve this situation, such as 3D printing of organs or genetically modified animal cultivation for organ xenotransplantation [13].

The problems at the level of smaller towns

Despite the wonderful technological and medical innovations, we need to focus on real adversities that we can change without involving the biotechnological sector. Specifically, the current issue is the level of health education in smaller towns, as indicated by the fact that age groups in our study showed no correlation with any question in the survey. This is an interesting aspect because one might think that age groups below 40 years old should demonstrate greater knowledge and awareness of the role of transplantology.

First and foremost, it can be observed that based on the survey, women were more likely to have heard about being a living organ donor, which could be correlated with the fact that women more often graduate from higher education institutions, where among 292,306 graduates, women constituted 62.89% (N=183,817), based on data from the academic year 2022/2023 [14]. Additionally, our study revealed a strong correlation confirming that women with higher education more frequently submitted correct answers in comparison to women without higher education ($p<0.01$).

Furthermore, women in our study were more inclined to become a living donor for a stranger than men, which is stereotypical but also scientifically justified, as they tend to be more empathetic [15].

What is noticeable in this aspect, is the fact that men constitute a potential pool to increase the number of possible living organ donors.

Ultimately, everything boils down to the issue of health education among populations in smaller towns. A significant challenge lies in the socioeconomic diversity of rural areas and the approach to education among rural children, which translates into the attitudes of the younger generation. These children often find fulfillment in household chores more frequently but also exhibit less enthusiasm for attending school. However, this does not necessarily translate into the level of education in rural populations, as in 2021, the percentage of people with higher education in rural areas increased by 16pp [16].

Without delving into methods to increase the willingness to attend school, we must realize the role of intensifying and concentrating information that would be particularly important for the health of future generations. Furthermore, focusing on educating the parents of these children plays an equally important role in creating appropriate habits and forming a healthy lifestyle, thereby improving the level of public health, and interestingly vice versa [17].

This is especially true because the level of education is related to knowledge about transplantology; knowledge which organ is most commonly transplanted in Poland – the kidney ($p<0.05$), what transplantation is, and what the conditions are for becoming a donor [1,18,19]. The questionnaire also included questions about organs that can be donated by a living donor, what can be done to become a donor (including completing a declaration of intent), and what presumed consent is [20,21]. The final question assessing knowledge about transplants was about conditions that disqualify someone from being a donor [22].

Possible donor pool

What must be taken into account is that both Ryglice and Zalasowa are located in Ryglice commune, which by the Eurostat precisely DEGURBA (Degree of Urbanization) is classified to DEGURBA code 3 (rural areas) meaning more than 50% of the population lives in rural grid cells (outside of urban clusters/centers) [23].

The estimated number could be surprising considering that the areas classified as Degurba 3 in Poland are the most numerous (N=1876) with a corresponding decrease – DEGURBA 2 (M=526), DEGURBA 1 (N=75).The Internet is the most frequently declared source of information about transplantology by respondents (48% of the whole group), particularly among the <60 years old age group (55%).

This gives us the opportunity to conduct appropriate campaigns promoting donation, especially given the current rapid increase in digitization of society [24]. An important factor is the growth of Internet users by over 5 million in the last 4 years [25].

CONCLUSIONS

The society in smaller localities and rural areas is diverse, which makes precise statistics difficult. However, based on our study, we can conclude that contrary to the perception of an increasingly aware society, the population of urban-rural areas does not show a tendency towards greater knowledge among younger generations under the age of 40. This is an issue worth addressing, as it will undoubtedly provide us with the opportunity to build a better organ and tissue donation system in the future.

Primarily, there needs to be a proper approach towards men from these areas, as women are more willing to become living organ donors for strangers.

Additionally, attention should be focused on legal regulations and the legislation of the organ donation process, as individuals still lack awareness of presumed consent or advance directives. With the assistance of increasingly advanced technologies, we are capable of constructing an excellent medical-technological environment. However, until the implementation of these solutions on a broad scale, there is a need to work on fostering people's willingness to help others.

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