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## Parent's attitude to vaccinations

Natalia Świątoniowska<sup>1</sup>, Paulina Tylak<sup>2</sup>, Kathie Sarzyńska<sup>2</sup>, Anna Rozensztrauch<sup>3</sup>

<sup>1</sup>Department of Clinical Nursing, Faculty of Health Sciences, Wrocław Medical University, Poland

<sup>2</sup>Pediatric Nursing Student Association, Faculty of Health Science, Wrocław Medical University

<sup>3</sup>Department of Pediatric, Division of Neonatology, Faculty of Health Science, Wrocław Medical University, Poland

### Summary

**Introduction.** Vaccination is an important primary prevention of infectious diseases. Their main task is to prevent infectious diseases and their complications. High excretion causes the development of collective resistance, extremely important in reducing the risk of disease of the entire population. According to the WHO, vaccinations save around 2.5 million people a year. The negative perception of vaccination by parents can be an important barrier during making vaccination decisions.

**The aim of the study** was to assess the parents' relation to immunization.

**Material and methods.** 98 people were examined: 91 women and 7 men from July to October 2018 using the CAWI method. The own questionnaire consisted of two parts - sociodemographic and parental relation to protective vaccinations.

**Results.** In the comparative analysis people living in the city significantly more often thought about the legitimacy of vaccinations adopted in childhood compared to people living in rural areas (59.7% vs. 40.3%,  $p=0.021$ ), while people with secondary education level significantly less often compared to people with higher and professional education level (63.4% vs. 37% vs. 33.3%,  $p=0.022$ ). Parents with one child were less likely to recall vaccinations for reasons other than illness or allergy compared to parents of two or three / four children (14.3% vs. 23.9% vs. 16.7%,  $p=0.012$ , respectively). Parents with two children were more often convinced that the diseases they prevent vaccination are not serious compared to the parents of one or three / four children (respectively 15.2% vs. 9.5% vs. 0,  $p=0.020$ ). Gender, age, occupational activity and occupation did not differentiate the group's opinion in a statistically significant manner ( $p > 0.05$ ).

**Conclusions.** Secondary education, living in the countryside and having one child had positive impact on the parents' opinion on immunization of children. The parents' attitude did not depend on age, sex, professional activity and occupation.

**Key words:** parents' attitude, opinion, vaccinations

## Introduction

Vaccination is an important element in the prevention of many diseases which in previous decades led to epidemics and caused high mortality. In recent years, as a result of a decrease in confidence in vaccinations, many countries in the European Union have noticed a reduction in the percentage of vaccinated individuals. According to the literature, this is due to popular anti-vaccine propaganda circulating on the Internet, religious beliefs, and the lack of public trust in governing bodies [1].

There are two systems of vaccination programmes in the European Union. One of them is centralized, where all vaccinations are given free of charge and are voluntarily. Such a vaccination policy is carried out, for example, in Finland. Another system of vaccination is decentralized, for instance, in Germany. It is based on the financing of vaccinations by private insurance companies; the choice of the vaccine depends on the primary care doctor or paediatrician. The National Vaccination Programme in Poland is a combination of these two models. In practice, this means that part of the cost of the vaccination is funded by the state (mandatory vaccination), and part comes from the patient's resources or is partly co-financed from state funds.

The primary aim of vaccination is to prevent infectious diseases and their complications. Vaccinations also have an impact on the development of collective immunity, reducing the risk of diseases in the entire population. The benefits to the patient and his/her family include the lack of disease or its transition to a mild form, as well as an increase in the quality of life [2]. Given the aforementioned advantages of vaccination, we can notice the significant role of the promotion of vaccinations in health prophylaxis. The information contained in educational materials increases awareness of inoculation. Other forms of such promotion are meetings with specialists in schools, and counselling by competent medical staff who can provide information about a given vaccine [3]. Given the above, the aim of the study was to assess parents' attitude towards vaccination.

## Material and methods

98 people were enrolled in the study: 91 women and 7 men. The research lasted from July to October 2018. The study was conducted using the CAWI method and a 2-part self-developed questionnaire. The first part included questions about socio-demographic data. The second part contained 13 questions about the parents' attitude to children's immunization. The questionnaire raised the issue of the validity of vaccinations, their organization, trust in doctors, as well as the concerns and immunity of the child. All the respondents were informed about the purpose and course of the study and gave their written consent to participate in the trial.

## Results

The collected research material was subjected to statistical analysis using the R program. Quantitative variables were analyzed by calculating mean, median, standard deviation, quartiles, maximum and minimum. On the other hand, qualitative variables were subjected to statistical analysis by calculating the number and percentage of the occurrence of each value. The significance level was assumed at  $p = 0.05$ .

### *Characteristics of the study group*

Socio-demographic characteristics of the study group are presented in Table 1. Women predominated (92.9%). Most of the respondents lived in the city (73.5%), were professionally active (68.4%), and had secondary or higher education (41.8% and 55.1%, respectively). The vast majority of the respondents were professionally unrelated to medicine - 86.7%. The subjects were divided into 4 groups based on age, of which the largest were groups I (20-29 years) and II (30-39 years) - 52% and 34.7%, respectively. Parents of one child (42.9%) or two children (46.9%) dominated among the respondents.

**Table 1.** Socio-demographic characteristics of the respondents.

Variable	N	%
Sex:		
Female	91	92.9%
Male	7	7.1%

Age:		
20-29 years	51	52%
30-39 years	34	34.7%
40-49 years	10	10.2%
Over 50 years	3	3.1%
Place of residence:		
City	72	73.5%
Village	26	26.5%
Education:		
Primary	0	0%
Secondary	41	41.8%
Occupational	3	3.1%
Higher	54	55.1%
Professional activity:		
Yes	67	68.4%
No	31	31.6%
Profession:		
Medical	13	13.3%
Non-medical	85	86.7%
Number of children:		
0	4	4.1%
1	42	42.9%
2	46	46.9%
3	3	3.1%
4	3	3.1%

### *The attitude of parents towards vaccinations*

In the second part of the study, the respondents were asked to answer 13 questions regarding their attitude to their children's immunization (Tab. 2).

**Table 2.** Percentage of individual answers

Question	Answer	Frequency	
		N	%
Have you ever abandoned your child's vaccination for reasons other than illness or allergy?	Yes	N	18
		%	18.4%
	No	N	78
		%	79.6%
	I do not know	N	2
		%	2%
Have you ever decided that your child has been vaccinated for reasons other than illness or allergy?	Yes	N	18
		%	18.4%
	No	N	78
		%	79.6%
	I do not know	N	2
		%	2%
Children are vaccinated more frequently than necessary.	I definitely agree	N	42
		%	42.9%
	I strongly disagree	N	56
		%	57.1%
I believe that many of the diseases that	I definitely agree	N	84

vaccines prevent are serious.		%	85.7%
	I strongly disagree	N	14
		%	14.3%
It is better for my child to develop immunity through falling ill than by vaccination	I definitely agree	N	21
		%	21.4%
	I strongly disagree	N	77
		%	78.6%
It is better for children to be vaccinated with fewer vaccines at one time.	I definitely agree	N	66
		%	67.3%
	I strongly disagree	N	32
		%	32.7%
I trust the information about vaccinations.	I definitely agree	N	69
		%	70.4%
	I strongly disagree	N	29
		%	29.6%
I am able to openly discuss my concerns about vaccinations with my child's doctor.	I definitely agree	N	82
		%	83.7%
	I strongly disagree	N	16
		%	16.3%
How worried are you that your child may have a serious side effect after the vaccine?	Not worried at all	N	51
		%	52%
	Very much worried	N	47
		%	48%
How worried are you that one of the childhood immunizations may not be safe?	Not worried at all	N	49
		%	50%
	Very much worried	N	49
		%	50%
How worried are you that the vaccine may not prevent the disease?	Not worried at all	N	63
		%	64.3%
	Very much worried	N	33
		%	33.7%
	No answer	N	2
		%	2%
If you had a small child today, would you like him/her to get all the recommended vaccinations?	Yes	N	72
		%	73.5%
	No	N	14
		%	14.3%
	I do not know	N	12
		%	12.2%
Have you ever considered the validity of the vaccinations that you received in childhood?	Yes	N	51
		%	52%
	No	N	47
		%	48%

The analysis of the answers shows that 79.6% of the respondents have never abandoned vaccinations for reasons other than illness or allergy, and did not decide to vaccinate their child for reasons other than allergy, and only 18.4% made the opposite decision. As for the number of vaccinations, 42.9% of people think that children are vaccinated more frequently than necessary. As many as 85.7% of the respondents believe that vaccines prevent many serious diseases. Only 21.4% of the respondents are convinced that it is better for the child to develop immunity through falling ill than by inoculation, while the vast majority of the subjects (78.6%) disagreed with this statement.

67.3% of the people believe that vaccination with fewer vaccines at one time is better for the child. 70.4% of the respondents said that they trusted the information about vaccinations they

received, while 29.6% stated their distrust of this information. As many as 83.7% of the respondents were able to discuss their concerns about vaccination with a doctor, and the remaining 16.3% were not able to do so. 48% of the people were worried about the possibility of serious side effects after vaccination, and were afraid that one of the vaccines might not be safe (50%). Only 33.7% of the respondents were bothered that the vaccine may not prevent the disease. 52% of the people believed in the validity of the vaccinations they received in childhood. Only 73.5% of the respondents who in the past vaccinated their children according to the vaccination schedule would now decide to vaccinate a small child with all the recommended vaccinations. 14.3% of the subjects would definitely refuse to vaccinate the child if they were to make that decision again.

How sure are you that following the current vaccination programme is a good idea for your child?

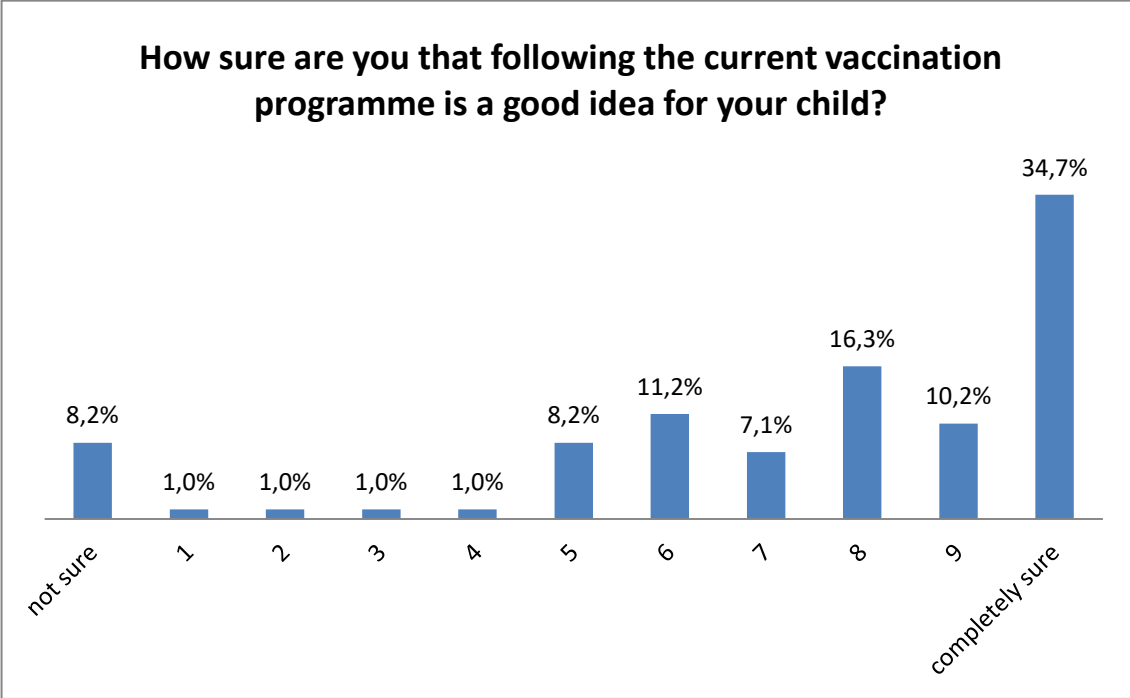


Fig. 1. The level of respondents' confidence in the validity of following the rules of the vaccination programme.

Fig. 1 shows the level of respondents' confidence in the validity of following the rules of the vaccination programme. The average result was  $7.4 \pm 2.99$ . One-third of the respondents believed that compliance with the current vaccination programme certainly brings benefits to the child, while a lack of certainty was expressed by 8.2% of the respondents.

How much do you trust your child's doctor?

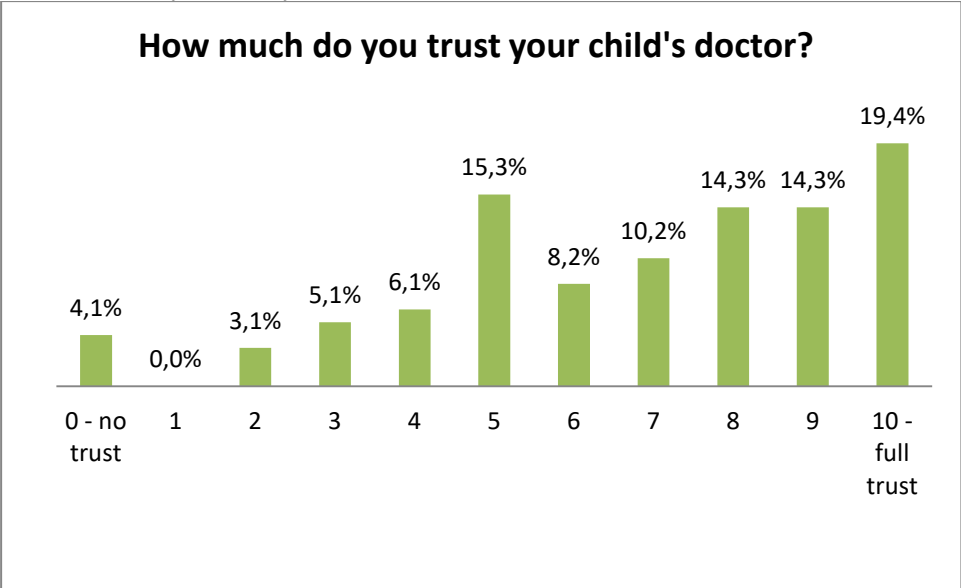


Fig. 2. The level of trust in the paediatrician.

The level of trust in the paediatrician is shown in Figure 1. The average level of confidence was  $6.8 \pm 2.71$ . 19.4% of parents, the highest percentage, answered that they trust the paediatrician completely. Only 4.1% of the respondents do not trust their child's doctor at all.

**The influence of selected variables on the parents' attitude to immunization**

Parents with one child were less likely to abandon vaccinations for reasons other than illness or allergy compared to parents having two or three/four children (14.3% vs. 23.9% vs. 16.7%,  $p = 0.012$ , respectively); (Tab.4). Parents of two children were more often convinced that the diseases prevented by vaccination are not serious compared to the parents of one or three/four children (respectively, 15.2% vs. 9.5% vs. 0,  $p = 0.020$ ).

**Tab. 4.**

Question	Answer	Frequency	Number of children			P-test result
			one	two	three or four	
Have you ever abandoned your child's vaccination for reasons other than illness or allergy?	Yes	N	6	11	1	<b><i>p=0.012</i></b>
		%	14.3%	23.9%	16.7%	
	No	N	38	35	5	
		%	90.5%	76.1%	83.3%	
	I do not know	N	2	0	0	
		%	4.8%	0.0%	0.0%	
I believe that many of the diseases that vaccines prevent are serious.	I definitely agree	N	38	39	6	<b><i>p=0.020</i></b>
		%	90.5%	84.8%	100.0%	
	I strongly disagree	N	4	7	0	
		%	9.5%	15.2%	0.0%	

People living in the city statistically more often declared that they were considering the validity of the vaccinations they received in childhood compared to people living in rural areas (respectively 59.7% vs. 40.3%,  $p = 0.021$ ); (Tab.5).

**Tab. 5.**

Question	Answer	Frequency	Place of residence		P-test result
			Village	City	
Have you ever considered the validity of the vaccinations that you received in childhood?	Yes	N	8	43	<b><i>p=0.021</i></b>
		%	30.8%	59.7%	
	No	N	18	29	
		%	69.2%	40.3%	

The respondents having secondary education significantly less often than people with higher and vocational education considered the validity of the vaccinations received in childhood (63.4% vs. 37% vs. 33.3%,  $p = 0.022$ ); (Table 6).

**Tab. 6.**

Question	Answer	Frequency	Education			P-test result
			occupational	secondary	higher	
Have you ever considered the validity of the vaccinations that you received in childhood?	Yes	N	2	15	34	<b><i>p=0.022</i></b>
		%	66.7%	36.6%	63.0%	
	No	N	1	26	20	
		%	33.3%	63.4%	37.0%	

Gender, age, occupational activity and the type of occupation did not have a statistically significant impact on the opinion expressed by a given group ( $p > 0.05$ ).

## Discussion

The research into parents' beliefs in the validity of vaccinations and their concerns about the possibility of side effects is vital to determine the level of knowledge and identify the related misconceptions. This may help to create educational programmes aimed at compensating for the knowledge deficits detected in the studies.

The results presented in the paper confirmed parents' belief in the important role of vaccination, as 85.7% of them were convinced that vaccines prevent many serious diseases. This opinion expressed by parents is also confirmed by other studies [4,5,6]. According to the report of NIK (Supreme Audit Office) from 2015, for years the percentage of vaccinated children has remained at a level over 95%. This value is assumed to be epidemiologically safe (this is the lower limit of community resistance). According to the same data, from 2010 to 2014 the percentage of children vaccinated with mandatory vaccinations slowly decreases [7]. The official report of 2017 on the percentage of vaccinated children is currently available. However, according to preliminary data from the National Institute of Public Health-National Institute of Hygiene (NIZP-PZH), in 2017 the vaccination coverage level in Poland fell below 95%. This information was provided during a conference organized on the occasion of the European Week of Vaccinations by Iwona Paradowska-Stankiewicz, MD, PhD, National Consultant on Epidemiology [8]. In the long term perspective the above trend may be worrying, and may result from the activities of anti-vaccine organizations.

The analysis of the study results showed that almost half (47%) of the respondents are afraid of vaccination side effects. This is by far the biggest difference in research for recent years, as in the work of Rogalska et al. from 2010 and Świątoniowska and Rozensztrauch from 2017, respectively 9% and 14.7% of the people declared the fear of a vaccine injury [9], [10]. However, the study conducted by Leszczyńska et al. in 2017 demonstrated that among all the respondents, 71% did not encounter any disturbing reports on vaccinations [5]. Further analysis of the research results revealed that gender, age and profession did not have a statistically significant ( $p > 0.05$ ) impact on the opinion expressed by a given group on the use of vaccines. This outcome is surprising compared to the results of the research carried out by other authors. The study conducted by Świątoniowska and Rozensztrauch in 2017 demonstrated that compared to older people, younger people more frequently declared their support of vaccinations ( $p < 0.05$ ). In addition, people with higher education and working in medical professions [10] more often took advantage of additional vaccinations. However, the study conducted by Gilkey et al. in 2013 in the United States, and the research of Bocquier et al. carried out in 2018 in the French population proved that women more often than men declared not vaccinating the child due to forgetfulness (13% vs. 7%). This practice was also more frequent among respondents with higher education compared to people with primary education (14% vs. 5%) [11,12].

The studies also showed that people living in the city statistically more often believed in the validity of the vaccinations they received in childhood as compared to people living in the village (59.7% vs. 40.3%, respectively). Also, in their study of 2017, Świątoniowska and Rozensztrauch demonstrated that urban residents more frequently than the inhabitants of the village agreed with the opinion that vaccination could harm the child (25.8% vs. 8.3%) [10]. The confirmation of this result can also be found in the research conducted by Rogalska et al. in 2010 [9]. This may be due to the fact that city dwellers often search for information on the Internet, where websites devoted to the negative effects of vaccination are very widespread.

The report of the Supreme Audit Office reveals that the total number of vaccine injuries reported between 2011-2014 increased almost twofold, from 1136 to 2346 cases [7]. The rise in registered vaccine injuries in children observed over the period of 4 years may be a cause of parents' concern about the safety of vaccines, as demonstrated in this paper. Respondents' distrust in vaccine safety has also been confirmed by the results of our study, in which more than 67.3% of the people preferred that their children were vaccinated with fewer vaccines at one time. It is also disturbing that now only 73.4% of the respondents would decide to vaccinate their child with all the recommended vaccines.

According to the report of 2016, Poland ranks 13th and 16th in Europe in terms of the number of people convinced about the safety and effectiveness of vaccinations [6]. The reason for parents' fear of the harmfulness of vaccination may also arise from insufficient knowledge about the prevalence of vaccine injuries, which in the total population of children subjected to vaccinations constitutes a negligible percentage. In order to increase knowledge about vaccination it is necessary to intensify

activities aimed at promoting the safety of vaccinations confirmed by scientific evidence and spread information about the low incidence of vaccine injuries. It is important to popularize knowledge about vaccine injuries, which are mostly mild, do not affect the health and life of the child, and usually subside spontaneously without treatment. It is also reasonable to consider taking appropriate legal measures against people/organizations that promote false information about vaccines, as their actions may increase parents' reluctance to vaccinate, and further intensify fear of the harmfulness of vaccines. The spread of negative attitudes towards vaccination and further intensification of parents' fears may in the future increase the number of unvaccinated children and lead to the return of serious infectious diseases. This could endanger the population of our country and significantly increase the costs related to the treatment of diseases which, thanks to the use of vaccines, were completely eradicated.

## Conclusions

1. Secondary education, the fact of living in the village, and having one child had a positive influence on parents' opinion on children's vaccination.
2. The attitude of parents to vaccination does not depend on age, sex, professional activity or occupation.
3. The number of people who are afraid of the negative effects of vaccination is growing.
4. The vaccination coverage level in Poland is systematically decreasing.

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