COMPARISON OF PARENTAL ATTITUDES ON CHILD VACCINATION WITH REGARD TO MEDICAL EDUCATION

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Received on 15. 3. 2025. *Reviewed on 1. 4. 2025.* *Accepted on 30.4.2025.*

ABSTRACT

Objective: Examine the attitudes of parents towards vaccination of children as well as the reasons for any negative attitude. In doing so, to determine whether there are differences in attitudes depending on formal medical education.

Subjects and Methods: Data were collected from 100 participants at the Srebrnjak Children's Hospital via an anonymous questionnaire. The questionnaire consists of 14 questions that include some relevant parameters such as the age of the parents, number of children, education, previous experience with vaccines, etc. The data were processed using the $\chi 2$ test, with a significance level of $p<0.01$.

Results: Data processing determined that in the sample examined, which was divided into those with and those without medical education, there was a significant difference in terms of information about vaccination and the source of this information. The results show that parents with medical education are significantly better informed than parents without medical education. Regarding the influence of the media, a significant difference was found, with those with medical education being less susceptible to media influence regarding child vaccination. There was no significant difference according to the level of education, place of residence, number of children in the family, frequency of vaccination and occurrence of vaccination complications, reasons for negative attitude, or experience of other parents.

Conclusion: Medically educated parents have greater knowledge about vaccines and possible complications of vaccination, consult professionals more often, and are less susceptible to media influence, but regardless, they are equally skeptical about the benefits of vaccinating their children.

Keywords: vaccination, children, parental education, parental attitudes

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INTRODUCTION

Vaccination is a procedure that achieves specific immunity to one or more antigens, and is carried out to prevent disease. It is one of the most successful preventive medical interventions (1) and the greatest achievements in medicine and public health, and the best way to prevent the spread of infection, as well as the development of disease and its complications (2).

Vaccination achieves benefits for the individual who is vaccinated and for the entire social community. Protection against the disease against which the vaccine is given is achieved within a certain time and proportion of the population covered (3-6). Individual countries differ in terms of national vaccination schedules and the diseases included, the types and combinations of vaccines, the timing of vaccination and the age at which a particular vaccine is administered (7). The high proportion of the population vaccinated in childhood indicates that vaccination is a widely accepted measure (8), and maintaining these rates at a high level is important for reducing the incidence of infectious diseases and the occurrence of their complications (9).

Although vaccination has proven to be one of the most successful preventive measures, in recent years there has been a lot of media discussion about its inadvisability and side effects. The refusal of parents to vaccinate their children has led to a decrease in the frequency of vaccination, which ultimately results in an increase in the incidence of diseases that were in the elimination phase.

With the development of social networks, controversies have begun to arise regarding the justification of vaccination and the questioning of how useful/safe a particular vaccine actually is. Fear of the possible consequences of vaccination has emerged among parents. Such fear stems from anti-vaccination movements that spread their beliefs and claims via social networks with the participation of well-known public figures (10). The fundamental fear of parents relates to the question of how vaccination will affect the health of the child (11-13).

Vaccinations and vaccines have been the subject of public debate in recent years. Refusal and delay by parents to vaccinate their child is a public health risk (14). Health professionals should use their authority, knowledge and information from evidence-based medicine to inform and educate parents and promote vaccination and minimize its refusal (15).

Parents' perception of vaccination is directed towards the well-being of the child. For them, the safety of vaccines and the fear of unwanted side effects are the most important. In addition, measles, rubella, and mumps are considered by parents to be mild diseases that are easily treated with care and medical attention (16).

In recent years, great importance has been attached to the development of the child's natural immune system, healthy nutrition, and the positive effects of breastfeeding, which, with good hygiene conditions, are often considered sufficient protection against infectious diseases even without vaccination (17). The number of vaccines administered is problematic for parents, as are combination vaccines due to the various antigens that are simultaneously introduced into the child's body. Computerization brings the possibility of incorrect assessment and interpretation of expert papers, access to inaccurate information, which confuses parents (18,19).

A growing number of parents refuse to vaccinate their children for fear of side effects and are not familiar with the risk of such behavior, although, according to data from various studies, the actual frequency of allergic reactions to vaccinations is minor (0.65 to 1.53 cases per million doses of vaccine) (20).

Parents can also obtain information about vaccination from non-healthcare workers, from family, friends, other parents, the media, and their children's educators. Non-healthcare professionals working with children (e.g., preschool teachers, educators, psychologists, speech therapists, etc.), although they do not understand the pathogenesis and consequences of vaccine-preventable diseases, nor the complexity of indications and contraindications for vaccination, often contribute to parents' indecision with their comments. The increasing trend of refusal of children to be vaccinated for non-medical reasons is worrying, and in some communities it ranges from 1% to as much as 26% (21).

Communication between the primary care physician and parents is of utmost importance in educating parents about vaccination. Today's parents want to be partners in decision-making. Such direct communication is more important than messages in brochures and population campaigns, but it requires additional effort and time (22).

OBJECTIVE

The objective of the study is to compare parents' attitudes towards vaccination of their children with regard to some sociodemographic parameters and medical education.

SUBJECTS AND METHODS

In order to compare parents' attitudes and whether the level and type of education (medical/non-medical) have a significant impact on their attitudes towards vaccination of their children, an anonymous survey of 100 parents was conducted using a self-administered questionnaire. Approval for the research was granted by the Ethics Committee of the Children's Hospital Srebrnjak. The anonymous survey was conducted among parents when they came to the hospital with their children for a medical examination (Appendix). Participants previously gave written consent, after the purpose of the survey was explained to them.

The questionnaire consists of 14 questions covering some relevant parameters such as age, formal medical education, number of children, previous experience with vaccination, etc. The obtained data were analyzed to determine the significance of the differences in attitudes. The $\chi 2$ test was used in the statistical analysis of the data, and the significance of the difference was determined at the $p < 0.01$ level.

RESULTS

The largest proportion of participants is between 30 and 39 years of age, while the average age is 38.8 years. Table 1 shows the difference between the genders of parents in relation to formal medical education.

Table 1. *Participants by gender and medical education*

Sex	Medical	Non-medical
Male	3 (7,9%)	23 (37,1%)
Female	35 (92,1%)	39 (62,9%)
SUMMA	38	62

χ^2=10,44; **p=0,00123**

There is a significant difference between the genders of the surveyed parents, in favor of the fact that female respondents have a significantly higher level of formal medical education. The largest share of participants by level of education is made up of those with secondary education, and they are also the most common in the category of participants with formal medical education (52.6%). There is no significant difference in the level of education between the participants with regard to medical education (χ^2=9,01; p=0,02917).

No significant difference was found between the studied groups in relation to the number of inhabitants in the places they come from (χ2=7.896, p=0.162).

The difference between the participants in relation to the number of children also is not significant (χ2=0.87; p=0.64597). The largest number of parents has two children, and the smallest number is those with three or more children.

The differences in relation to the regularity of vaccination is not significant (χ2=1.359; p=0.24371).

Attitudes towards the benefits of vaccination are presented in Table 2. A large proportion of surveyed parents believe that the vaccine provides a certain level of protection, and the difference is not significant (χ2=2.958; p=0.22786). Surprisingly, as many as 10.6% of participants with medical education believe that the vaccine does more harm than good.

Table 2. *Participants' attitudes towards vaccination in relation to education*

Attitude to vaccination	Meadical	Non-medical
The vaccine provides some protection	33 (86,8%)	45 (72,6%)
The vaccine does more harm than good	4 (10,6%)	15 (24,2%)
I don know	1 (2,6%)	2 (3,2%)

χ^2=2,958; p=0,22786

Among the reasons for their negative attitude towards vaccination, parents cite possible complications after vaccination, and a few believe that vaccination does more harm than good, and the difference was not determined in relation to their formal medical education (χ2=1.079; p=0.58303).

Regarding their experience with complications after vaccination, most parents (77 of them) cite certain complications. Some of the complications listed are edema of the legs and arms, redness, rash and itching, fever, nausea, vomiting, diarrhea, and granulation inflammation with necrosis. No significant difference was found in this variable with respect to the medical education of the participants (χ2=0.726, p=0.39418).

Vaccine awareness showed significant differences ($\chi2$=20.669, p=0.00003) in favor of parents with medical education (Table 3), although the majority of participants assessed their vaccine awareness as satisfactory.

Table 3. *Vaccine awareness in relation to education*

Vaccine awareness	Medical	Non-medical
Good	13 (34,2%)	5 (8,1%)
Satisfying	25 (65,8%)	38 (61,3%)
Bad	0 (0%)	19 (30,6%)

χ^2=20,669; **p=0,00003**

Except for those with formal medical education, parents most often gather information from other parents. No parent reported getting information about vaccination from a community nurse or family doctor (Table 4). There is a significant difference in this variable with respect to parental education, with those with formal medical education most often seeking information from a pediatrician, followed by the media ($\chi2$=15.6; p=0.00136).

Table 4. *Source of information about vaccination in relation to education*

Source of information	Medical	Non-medical
Pediatrician	24 (63,2%)	25 (40,3%)
Health visitor	0 (0%)	0 (0%)
Doctor of primary care	0 (0%)	0 (0%)
Frend	0 (0%)	2 (3,2%)
Other parents	3 (7,9%)	26 (41,9%)
Media	11 (28,9%)	9 (14,6%)
Other	0 (0%)	0 (0%)

χ^2=15,6; **p=0,00136**

Table 5 shows the influence of the media on parents' attitudes towards vaccination. The largest number of parents responded that the media “perhaps” influenced their attitude (N=47). An equal number of parents responded that the media had (N=22) or had no influence (N=21). The influence of the media shows a significant difference between participants with regard to medical education ($\chi2$=25.031, p=0.000003). Parents with medical education are significantly less susceptible to media influence regarding the vaccination of their children.

Table 5. *Influence of the media on attitudes towards the vaccination of their children*

Influence of the media	Medical	Non - medical
YES	9 (23,7%)	13 (20,1%)
NO	22 (57,9%)	9 (14,5%)
Perhaps	7 (18,4%)	40 (64,4%)

χ^2=25,031; **p=0,000003**

Regarding the influence of other parents' experiences, there is no significant difference among the participants ($\chi 2$=0.669, p=0.41340).

DISCUSSION

In the last few years, there has been a public debate about the possible consequences of vaccination. Parents' refusal and delay in vaccinating their children is becoming a serious public health problem (14). Parents' perception of vaccination is focused on the well-being of the child. For them, the most important things are the safety of vaccines and the fear of unwanted side effects. There is probably no topic in the media today that is more controversial than the vaccination of children. Since the very beginning of vaccination, public opinions have been divided. Therefore, this study presents parents' attitudes towards vaccination, collected using a questionnaire with different variables, depending on their formal medical education.

Research on parental attitudes towards vaccination shows that individual decision-making is complex and may involve political, cognitive, cultural, social, educational and emotional factors (23,24). In Croatia, the problem of the Roma national minority not responding to mandatory vaccination has been identified (25), and an information campaign on vaccination of this minority group was carried out within the framework of the Decade for Roma project (2).

It can be assumed that people with medical education have a professionally based attitude towards this problem. Therefore, the participants were divided into two groups, depending on their formal medical education. There is a significant difference between the genders of parents in favor of women with formal medical education. The results show that there is no significant difference between these two groups according to the level of education, place of residence and number of children. Furthermore, there is no significant difference according to the regularity of vaccination of children. Although the difference was not established, it is still significant that the share of parents who do not regularly vaccinate their children with medical education is lower compared to the share of other respondents (12.2% : 22.6%). Parents' attitudes towards vaccination and the reasons for the negative attitude also do not show a significant difference, regardless of medical education. However, it should be noted that parents with medical education are somewhat more likely to believe that vaccination provides some protection (86.8% : 72.6%). The attitude towards the frequency of complications after vaccination and the influence of other parents' experiences do not show a significant difference. It is understandable that a slightly higher percentage of medically educated parents know that complications after vaccination are possible (81.6%: 74.2%).

Regarding the level of information about vaccines, there is a significant difference between parents with regard to medical education. Namely, parents with medical education are significantly better informed about vaccines, which is self-explanatory. There is also a significant difference in the answers to the question related to the source of information about vaccination. Parents with medical education are significantly more likely to rely on the opinion of a pediatrician (63.2% : 40.3%), while those without medical education often rely on the opinion of other parents (41.9% : 7.9%). The influence of the media

on attitudes about vaccination also shows a significant difference. Parents without medical education are more likely to be influenced by the media, and the share of those on whom the media has no influence confirms this (57.9%:14.5%). Finally, there is no significant difference in terms of the influence of other parents' experiences on attitudes towards vaccination, but this influence is very high for respondents in both groups (63.2% and 54.8%).

Regarding research from other countries on parents' attitudes towards vaccination of children, one of them states that parents who received information from a doctor had a positive attitude towards vaccination (26). Parents with a negative attitude towards vaccination are those who have encountered bad experiences of other parents whose children had complications after vaccination (26). Another study, which included 414 participants, states that parents with no more than a secondary education have a positive attitude towards vaccination (27). This differs from the results presented in this study, where the level of education did not influence the parents' attitude. The same study states that parents with a positive previous experience, those who consider childhood infectious diseases to be dangerous and those who received information about vaccination from a doctor have a positive attitude towards immunization. According to the aforementioned study, immunization is more common in children whose parents have more knowledge about vaccination, those who believe that vaccination is beneficial and those who have not developed childhood infectious diseases (27).

A study in Australia found that most parents form their opinions based on political leaders and the media (28). On the other hand, a Danish study on parents' attitudes towards vaccination found no link with the influence of the media, specifically in this case for the MO-PA-RU vaccine (29).

Recently, data on this issue were published for Bosnia and Herzegovina, with interesting conclusions. Citizens of Bosnia and Herzegovina are not sure about vaccination, but they consider communication with a doctor to be important. They do not agree that vaccination causes more harm, but they believe that a vaccinated child can still get the disease against which he or she was vaccinated (2).

Parents are confused and concerned about the various contradictory information they encounter on social networks and in the media. Therefore, it is very important to work on educating the public about the importance of vaccination as one of the most effective public health preventive methods. Health professionals must direct education and advice towards promoting vaccination of children.

The limitation of this study is the fact that there is no adequately validated questionnaire and the relatively small number of respondents. Therefore, the results cannot be generalized.

CONCLUSION

The results suggest that medically educated parents have greater knowledge about vaccines and possible complications of vaccination, consult professionals more often, and are less susceptible to media influence, but are nevertheless equally skeptical about the benefits of vaccinating their children. It is clearly necessary to better address the topic of vaccination during medical education in order to

reduce the skepticism of healthcare professionals towards vaccination as undoubtedly the most important specific public health method.

Parents who do not have medical training should be advised to seek advice on vaccination from pediatricians and other health professionals, and vaccination of children should be promoted through the media. Public health services must use arguments to refute malicious and unfounded rumors about the harmfulness of vaccination.

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USPOREDBA STAVOVA RODITELJA O CIJEPLJENJU DJECE S OBZIROM NA MEDICINSKO OBRAZOVANJE

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SAŽETAK

Cilj: Ispitati stavove roditelja o cijepljenju djece kao i razloge eventualnog negativnog stava. Pritom utvrditi ima li razlike u stavovima ovisno o formalnoj medicinskoj edukaciji.

Ispitanici i Metode: Podaci su prikupljeni od 100 ispitanika u Dječjoj bolnici Srebrnjak putem anonimnog anketnog upitnika. Upitnik se sastoji od 14 pitanja koja obuhvaćaju neke relevantne parametre kao što su starost roditelja, broj djece, obrazovanje, dosadašnja iskustva primjenom cjepiva i sl. Podaci su obrađeni pomoću χ^2 testa, uz razinu značajnosti $p<0,01$.

Rezultati: Obradom podataka utvrđeno je kako u ispitanom uzorku, koji je podijeljen na one koji imaju i one koji nemaju medicinsku naobrazbu, postoji značajna razlika prema informiranosti o cijepljenju te prema izvoru tih informacija. Rezultati pokazuju kako su roditelji s medicinskim obrazovanjem znatno bolje informirani od roditelja koji nemaju medicinsko obrazovanje. Što se tiče utjecaja medija utvrđena je značajna razlika, pri čemu su oni s medicinskim obrazovanjem rjeđe podložni utjecaju medija u vezi s cijepljenjem djece. Značajna razlika ne postoji prema razini obrazovanja, mjestu stanovanja, broju djece u obitelji, učestalosti cijepljenja i pojavi komplikacija cijepljenja, razlozima negativnog stava kao ni prema iskustvu drugih roditelja.

Zaključak: Medicinski obrazovani roditelji imaju veće znanje o cjepivima i mogućim komplikacijama kod cijepljenja, češće konzultiraju struku te su manje podložni utjecaju medija, ali neovisno o tome podjednako su skeptični u pogledu koristi od cijepljenja svoje djece.

Ključne riječi: cijepljenje, djeca, obrazovanje roditelja, stavovi roditelja

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