



HESITANCES ABOUT COVID-19 VACCINATION AMONG STUDENTS, TEACHERS AND PARENTS

Miglena Tarnovska¹, Gergana Petrova², Emilya Avramova - Bakalova³

1) Department of Healthcare Management, Faculty of Public Health, Medical University of Plovdiv, Bulgaria,

2) Department of Nursing Care, Faculty of Public Health, Medical University of Plovdiv, Bulgaria.

3) Graduate student in Faculty of Public Health, Medical University of Plovdiv, Bulgaria.

ABSTRACT

Vaccination is a leading strategy for the prevention and control of individual and public health in the fight against the COVID-19 pandemic.

Purpose: This study aims to investigate and analyze the attitudes toward vaccination and the factors conditioning hesitancy about the vaccine's prevention of COVID-19 among three target groups: students, parents and teachers.

Materials and methods: An online anonymous survey was conducted among 228 participants - students in 11th and 12th grade at two language high schools in the city of Plovdiv (n=114), teachers (n=44) and parents (n=70) in November 2021

Results: Vaccination attitudes were fairly heterogeneous, ranging from complete agreement to categorical disagreement in the answers of all three studied groups. The prevailing opinion among parents is that vaccination has no absolute protective effect regarding the risk of infection with COVID-19. Both parents and teachers, as well as students, strongly object to mandatory vaccination against COVID-19. An important factor influencing the hesitancy of vaccine prevention is the concern of whether the new vaccines are harmless and effective. Negative expectations of possible adverse reactions to the administered vaccines are shared among half of the students and a significant part of the studied group of parents and teachers.

Conclusions: Established factors influencing vaccine hesitancy should be considered when conducting future vaccination trial campaigns for immunoprophylaxis among adolescents.

Keywords: COVID-19, vaccination, hesitations, students, teachers, parents,

INTRODUCTION

Vaccination is a leading strategy for the prevention and control of individual and public health in the fight against the COVID-19 pandemic. Evidence indicates that people who are vaccinated against COVID-19 are exposed to a lower risk of symptomatic or severe infection and death compared to the unvaccinated ones. The European Medicines Agency (EMA), responsible for monitoring medicines in the EU, has recommended expanding the scope of indications for vaccines against COVID-19 in children. According to the agency, the benefits of vaccination in children outweigh the risks, especially in conditions which increase people's susceptibility to more severe ongoing COVID-19 infection, while the safety and efficacy of vaccines will continue to be monitored closely through the pharmacologic system EU vigilance [1].

One hotly debated issue is whether the COVID-19 vaccine should be mandatory and whether that should be the case for children. Some ethicists have already made a general case for mandatory vaccination against COVID-19 without specifically arguing for vaccinating children. They have made certain assumptions about the availability and risk profile of the vaccine and suggested that there are very few legal obstacles to it, especially in the US. Mandatory vaccination for children may be required if vaccine uptake is insufficient or if governments have reasonable grounds to believe so. Since the timely implementation of effective vaccination policies saves lives, there may be a good reason to consider mandatory vaccination, including such for children, before less coercive policies are undertaken [2, 3]. According to the authors, while the risk to healthy children is less pronounced, healthy unvaccinated children who do not receive the vaccine can get and transmit the virus to vulnerable classmates, for example, children with medical conditions that put them at high risk if they get COVID-19, and to high-risk teachers (such as the teacher, administrator, or janitor who is over 60 years old, those who are immunocompromised or have conditions like diabetes or heart disease). There may be additional risks not yet discovered, for example, recent findings from the UK suggest that COVID-19 may cause a severe but rare syndrome in chil-

dren, though the data are yet too limited to be certain [3].

Childhood vaccination is carried out in many countries by voluntary acceptance by parents concerned about various infectious diseases. Provided that the COVID-19 vaccine demonstrates safety in children and reduces morbidity and the related socioeconomic problems due to the pandemic, the paediatric scientific community is considering the possibility of making this vaccine mandatory for children as well. Plotkin and Levy (2021) developed a conceptual framework for mandatory childhood vaccination, stating that vaccination of children will be necessary to achieve high coverage and, potentially, herd immunity. An important additional argument in favour of vaccinating children would be the reduction in the proliferation of the virus so that the protection of adults is warranted. If vaccines are very effective in children, they will protect parents, teachers and other children in contact with them [4].

According to the recommendations of the World Health Organization (WHO), schools should also encourage vaccinations among teachers, staff and eligible students. The role of the school as an institution is to provide information about vaccination against COVID-19, promote trust and confidence in vaccines, and establish supportive policies and practices to make vaccination as easy and convenient as possible [5].

At the same time, the concerns about vaccination hesitancy keeps growing, even before the COVID era, WHO defined vaccination hesitancy as one of the top ten health threats. According to WHO, vaccine hesitancy – the reluctance or refusal to vaccinate despite the availability of vaccines – threatens to reverse progress made in tackling vaccine-preventable diseases [6].

A thorough review of scientific literature confirms that there are community groups both in Europe and worldwide that experience hesitancy and are prone to delay or plainly refuse the placement of vaccines available to them. Experts issue warnings about a decline in public confidence in immunizations and an increase in vaccine hesitancy in recent years' decade [7]. A study by Bell S. et al. (2020) in the UK, specifically targeting parents' views on the acceptability of an antiviral vaccine against COVID-19, shows that more than half of the parents surveyed are more likely to get a vaccine against COVID-19 for themselves than for their children. The most frequent concerns identified in parents' responses related to the safety and effectiveness of the COVID-19 vaccine are mostly due to the novelty and rapid development of the vaccine itself [8].

A pivotal moment in the fight against the COVID-19 epidemic in Bulgaria has been the start of vaccination of children (from 5 to 11 years old) and young people (up to 17 years old), which became possible in mid-December 2021. According to data from the unified information portal for Bulgaria's COVID-19, as of November 2022, a total of 4 622 doses of pediatric vaccines have been administered in the age group of 5 to 11 years. For the same period, a total of 54 177 doses were administered in the age group of 12 to 17 years. Furthermore, the country still has the lowest immunization coverage among European countries (30.38% of the population has a complete vaccina-

tion course or 2 077 809 persons) [9].

A significant factor in vaccination strategy is the effective communication of the state institutions to build public confidence in vaccines against COVID-19. The success of the campaign, especially in children and adolescents, depends to a large extent on the willingness of parents to accept vaccines as a way of prevention for their children.

OBJECTIVE

The aim of this study is to investigate and analyze the attitudes toward vaccination and the factors conditioning hesitancy about the vaccine prevention of COVID-19 among three target groups - students, parents and teachers.

MATERIALS AND METHODS

A cross-sectional study using an online anonymous questionnaire was conducted among students in 11th and 12th grade at two language high schools in the city of Plovdiv, their parents, and teachers in November 2021. For this purpose, an electronic survey card was developed, containing an automatic filling link in Google Forms. The survey was disseminated through social media - the school platform for online learning, official e-mails of teachers, Facebook - parent groups.

Sample questions in the questionnaire included the following:

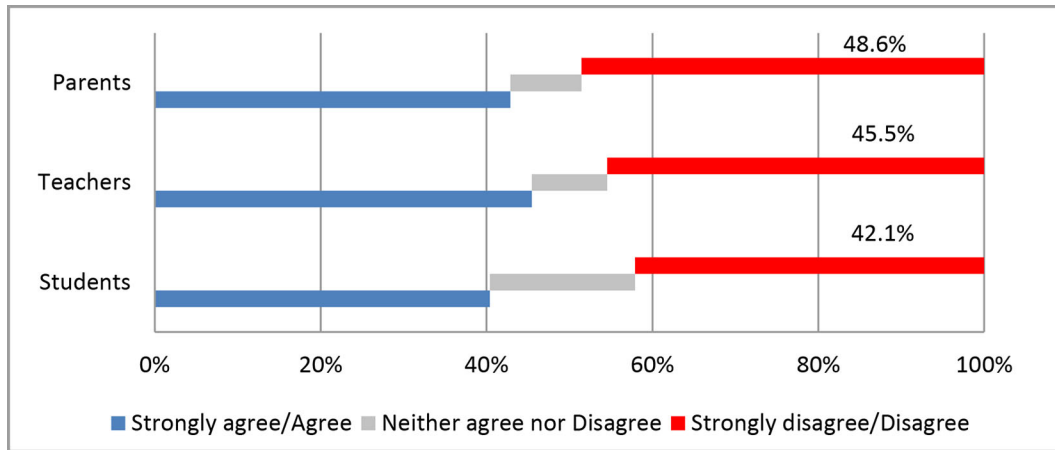
- Do you think vaccination is enough to protect against COVID-19?
- If you had the opportunity, would you get vaccinated?
- Do you support mandatory vaccination against COVID-19?
- Do you trust the information about the different vaccines against COVID-19?
- Vaccines against COVID-19 were developed as quickly as possible, and this calls into question their safety and efficacy.
- Are you afraid of the appearance of side effects reactions from the administration of vaccines against COVID-19?

A 5-point Likert scale (1- strongly agree to 5- Strongly disagree) was used to structure the answers in the survey. Logical units of observation were 114 students, 70 parents, and 44 teachers. Out of a total of 228 participants in the survey, 76.3% were female, and 23.7% were male. The data obtained were analyzed using SPSS statistical processing software, version 19.0. The Kruskal Wallis Test at a significance level of $p < 0.05$ was used to test hypotheses.

RESULTS

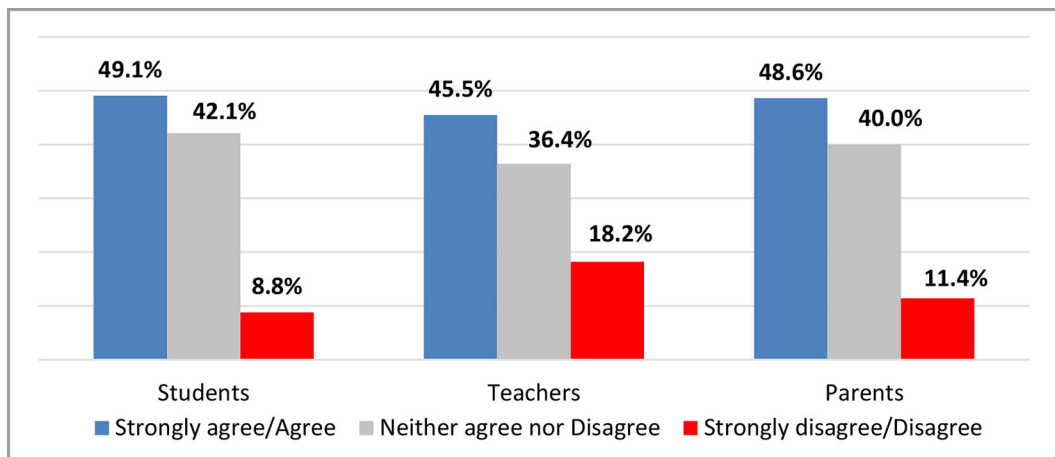
One of the main issues addressed to participants in the present study was related to the acceptability of vaccination against COVID-19 as a method of personal health prevention. Although about 40% of the respondents rather agree that antiviral vaccines contribute to disease prevention, the prevailing opinion among parents (48.6%) is that vaccination has no absolute protective effect regarding the risk of infection with COVID-19 (Fig. 1).

Fig. 1. Do you think vaccination is enough to protect against COVID-19?



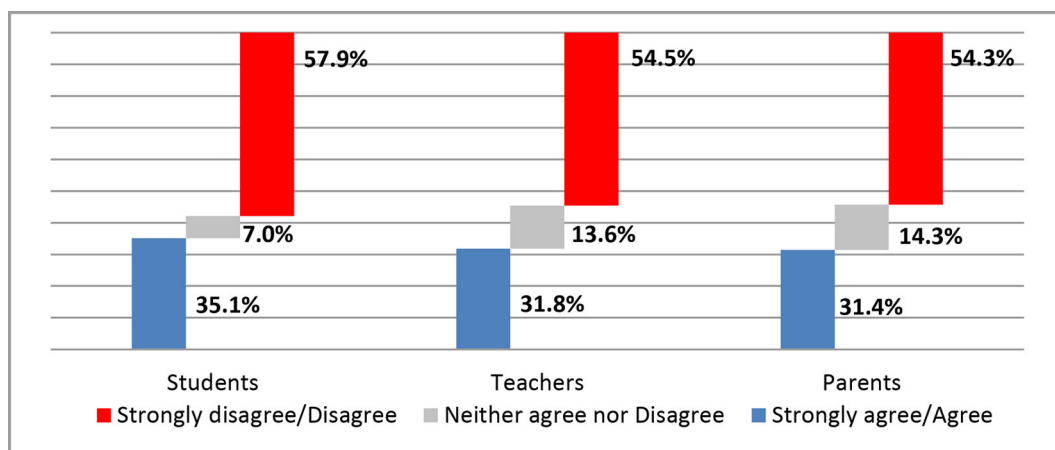
On the follow-up question, “If you had the opportunity, would you get vaccinated”, vaccination attitudes were fairly heterogenous, ranging from complete agreement to categorical disagreement in the answers of all three studied groups - students, teachers and parents (Fig 2).

Fig. 2. If you had the opportunity, would you get vaccinated?



Regarding one of the most controversial topics concerning the right of free choice for vaccination, all three studied groups were unanimous, expressing dissent against the use of coercion in public health preventive measure. Both parents (54.3%), teachers (54.5%), and students (57.3%) strongly object to mandatory vaccination against COVID-19 (Fig. 3).

Fig. 3. Do you support mandatory vaccination?

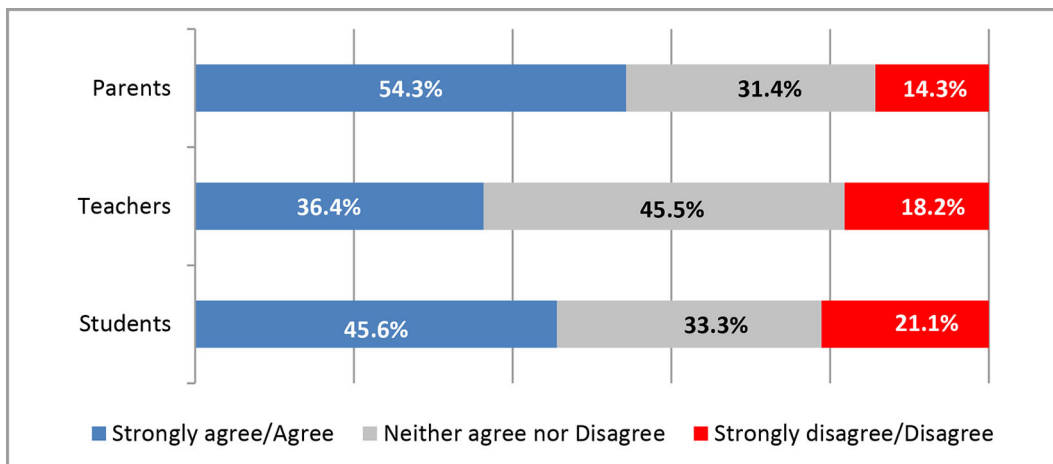


Probably, the achievement of collective immunity in the fight against the COVID-19 pandemic could be achieved through mandatory or coercive measures of vaccination, but such measures contradict a number of ethical and legal norms warranting the autonomous choice for personal health. The credible and culturally adapted communication strategy of state institutions plays an essential role in building trust and promoting COVID-19 vaccine prevention. Especially in ado-

lescents, such a properly structured strategy can positively influence health behavior regarding both the other preventive measures and the decision to vaccinate.

Data from our survey shows that 45.6% of students and 54.3% of parents tend to trust publicly available information about COVID-19 vaccines, while teachers are more reserved and somewhat sceptical about the reliability of the submitted information (Fig. 4).

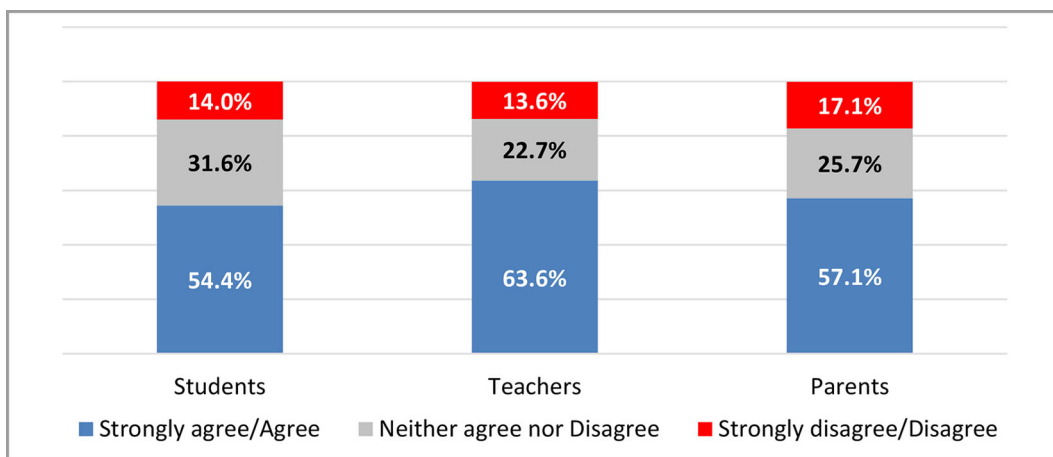
Fig. 4. Do you trust the information about the different vaccines against COVID-19?



Under the pressure of time, in the conditions of a rapidly growing pandemic and high mortality, pharmaceutical companies had to respond to public expectations for an efficient product for disease prevention and control. The record-breaking time it took for the COVID-19 vaccines to be developed, tested and approved brought to the fore the question of whether they would meet the same safety standards as all other vaccines.

In this regard, an expected factor influencing the hesitancy for vaccine prevention among the studied groups is the concern whether the new vaccines are harmless and effective enough to prevent the coronavirus infection. More than half of the surveyed students and parents are sceptical about the safety and efficacy of the administered vaccines. This doubt is also shared by 63.6% of the teaching staff (Fig. 5).

Fig. 5. Vaccines against COVID-19 were developed as quickly as possible, and this calls into question their safety and efficacy.



Although, according to official information, vaccines against COVID-19 have passed all the necessary tests for pharmaceuticals quality, preclinical studies as well as clinical trials, participants in the present study allow unfavourable effects after vaccination. The fact that 1/2 of the

students are afraid of the appearance of side effects is an indicative reaction to new vaccines. Negative expectations of possible adverse reactions to the administered vaccines are also shared to a significant extent in the studied group of parents and teachers (Fig. 6).

Fig. 6. Do you have concerns about the appearance of side effects reactions to COVID-19 vaccines?

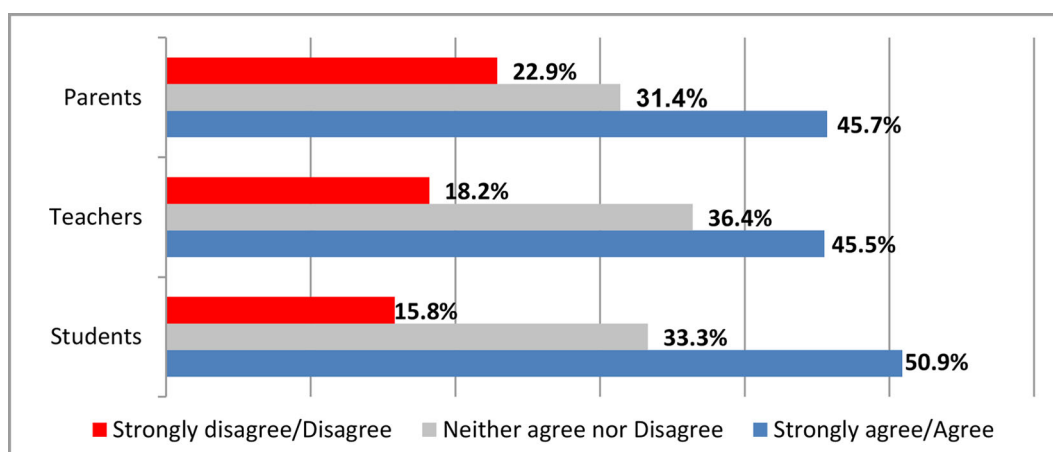


Table. 1 presents the average scores in the respondents ‘ answers to the questions asked. The Kruskal-Wallis Test did not establish a statistically significant difference between the medians in responses of three researched independent groups.

Table 1. Differences in responses given by the group of respondents

		Q1	Q2	Q3	Q4	Q5	Q6
Students	N	114	114	114	114	114	114
	Mean	3.19	2.86	2.63	2.53	3.47	2.84
	Std. Deviation	1.36	1.45	1.39	1.46	1.62	1.69
Teachers	N	44	44	44	44	44	44
	Mean	2.95	3	2.73	2.86	3.5	2.86
	Std. Deviation	1.57	1.4	1.26	1.59	1.61	1.71
Parents	N	70	70	70	70	70	70
	Mean	2.97	2.69	2.69	2.26	3.46	2.8
	Std. Deviation	1.61	1.56	1.38	1.45	1.6	1.72
Total	N	228	228	228	228	228	288
	Mean	3.08	2.83	2.67	2.51	3.47	2.83
	Std. Deviation	1.48	1.47	1.36	1.49	1.61	1.69
p-value		0.413	0.484	0.887	0.071	0.982	0.961

DISCUSSION

Vaccines against COVID-19 are a remarkable achievement of modern science in the fields of biology and medicine, especially those of the latest generation presented by the scientific community as being created by innovative mRNA technology. The progress of pharmaceutical technologies in the production of innovative products for immunoprophylaxis is an undeniable fact, but currently, there is not enough scientific evidence for the long-term effects of approved vaccines.

In this regard, it comes as no surprise that there is hesitancy regarding vaccines against COVID-19 among the target groups of students, parents, and teachers who studied. The analysis of the results found that hesitancy to vaccinate is primarily related to distrust in the safety and efficacy of the vaccines themselves, as well as the unpredictable side effects of vaccines. A significant contributor to

the mistrust of vaccines is the accelerated pace of their development under the pressure of the growing COVID-19 pandemic. The fact that there is no definite positive answer to the question “Would you get vaccinated?” is also indicative among the respondents.

The attitudes of the participants are polarized at the two extremes, from full agreement to extreme denying the possibility of a vaccine against COVID-19 as a way to preserve individual health.

At the threshold of adulthood, at the age period of 17-18 years, we assume that adolescents can make a conscious and reasonable choice “for” or “against “ vaccines, while in the more fragile childhood, a crucial role for the active vaccination is the conviction of the parents themselves. The uncertainty regarding the safety of the newly introduced vaccines, shared by 45.7% of the surveyed parents, their mistrust of vaccination in relation to the risk of

infection with COVID-19 (48.6%), as well as the attitudes to refuse vaccination (40%), are significant factors that should be taken into account when conducting future vaccinations campaigns for immunoprophylaxis against COVID-19.

Our results are corroborated to a significant extent in a study by Yigit M, et al. (2021) on the causality of vaccination against COVID-19 among parental community perceptions. The researchers identified the following factors as reasons for refusing vaccination: avoiding possible side effects of the vaccine (40.4%), not knowing the exact effectiveness of the vaccine (38.3%), mistrust of vaccines from abroad (29.4%), concerns about the adjuvants substances in the vaccine (22.7%), mistrust in the effectiveness of vaccines (9.3%), the chance that the virus will mutate, rendering the vaccine ineffective (1.2%), mistrust in companies developing vaccines (0.7%), and doubts that vaccines may contain microchips (0.2%) [10].

Still more alarming are the results found by Duran S, et al. (2021). The hesitant attitudes towards childhood and COVID-19 vaccines were low in parents who directly or indirectly experienced COVID-19 or were worried about the devastating effects of this disease. However, it was shown that as the COVID-19 pandemic progressed, parents' hesitations towards childhood vaccines increased [11].

Durmaz N, et al. (2022) found an interesting relationship between the attitude of parents to vaccinate their children and vaccination against COVID-19. Parents who are hesitant about childhood immunization programs in Turkey have a less positive attitude towards COVID-19 vaccines and are affected by social media. Parents need information about vaccines, and because the controversy surrounding COVID-19 vaccines can diminish parents' confidence in routine childhood immunizations, understanding the complex causes behind vaccination hesitancy can help public health policy break through barriers and increase immunization rates [12].

In contrast to the skepticism about the safety and efficacy of vaccines, some of the participants in the present study, mainly students and their parents tend to trust the generally available information about the vaccines against COVID-19, while the teachers seem reserved about the credibility of the information presented.

In Bulgaria, the start of the mass vaccination was accompanied by information campaigns of a number of state institutions aimed at the broad public, above all on the nature and effectiveness of the vaccines themselves, including by creating a single informational portal for the Ministry of Health. Similar doubt about the information about COVID-19 and vaccination can be explained by the theories disseminated in the mass media about intentional intervention in the origin of the new strain of coronavirus and the spread of the infection worldwide. Such theories, without concrete scientific evidence, are likely to cause confusion among the public and blur the credibility of the data in the information space, which in turn will lead to negative attitudes and rejection of immunoprophylaxis.

When reviewing the literature, we also came across results opposite to ours, namely a study by Al-Zalfawi SM,

et al. (2021), which found that most of the Saudi population has sound knowledge and a positive attitude and perception. Since the COVID-19 vaccines have been approved for use in pregnancy and for children above twelve years of age by health authorities, the lack of information shown by a significant percentage of participants requires strategies to update this information [13].

Awareness of the rejection status of vaccines against COVID-19 is a critical factor for personal and public health in the fight against the pandemic. The reluctance of individuals to be vaccinated may not necessarily be a poor predictor of rejection because vaccine decisions are multifactorial and can change over time. Immunization hesitancy is a multi-layered and context-specific problem. In 2015, the World Health Organization (WHO) Strategic Advisory Group of Experts on Immunization defined vaccine hesitancy as a 'delay in acceptance or refusal of vaccination despite the availability of vaccination service [14].

A summary analysis of the key elements and factors that influence hesitancy regarding immunizations worldwide and relevant to the context of Bulgaria is presented by Stoitsova S, et al. (2021). According to the authors, hesitancy occurs more often in relation to new or newly introduced vaccines than compared to the widely known and well-established long-ago ones and more often in connection with mass immunization campaigns than with the routine immunization calendar [15]. A WHO report points to other factors influencing vaccination hesitancy, such as: the safety and effectiveness profile of the vaccine, the reliability and/or source of vaccine supply and the technology and consumables associated with it, and the effectiveness of the message to health workers (the strength of their recommendations, the awareness they demonstrate, their attitudes towards the vaccine [16].

Trust is an intrinsic and potentially modifiable component of successful COVID-19 vaccine uptake. Addressing vaccine hesitancy requires more than building trust. According to Lazarus JV, et al. (2021), clear and consistent communication by state employees is crucial to building public confidence in vaccine programs. This includes explaining how vaccines work, as well as how they are developed, from employment to regulatory approval based on safety and efficacy.

The effective campaigns should also aim to carefully explain the level of vaccine effectiveness, the time required for protection (with multiple doses if necessary), and the importance of whole-population coverage to achieve communal immunity.

Instilling public confidence in regulatory reviews of vaccine safety and effectiveness agencies is also important [17].

In a school environment, the school nurse plays an essential role in promoting the health and health education of school-aged children. She is the health mediator between all interested parties – students, teachers and parents. It is crucial that school nurses are able to demonstrate the effectiveness of their service. In the educational setting, educators are asked to show that students achieve specific learning outcomes in the classroom. For school nurses,

the emphasis on measuring outcomes provides a particular challenge not only to show their interventions positively influence the health of children but also have an effect on educational outcomes [18, 19].

Adequate involvement of school nurses in key government priorities such as national immunization campaigns for COVID-19 is needed, with interventions that school nurses can offer to influence positive health by increasing confidence in immunizations among both learners and parents and teachers. A study by Guarinoni and Dignani (2021) found that the school nurse plays a key role in increasing the rate of adherence to immunization for school-age children. The figure of the school nurse plays a crucial role in increasing the adherence rate to immunization programmes for school-age children [20].

One of the most contested issues arising from the global health crisis is whether the COVID-19 vaccine should be mandatory and whether it should be mandatory for children [2, 3, 21]. Many countries, such as the USA, Canada, France, Italy, Austria and etc. undertook legalization policies which require compulsory vaccination or implementing a mechanism to ensure mass vaccination of the population. Such policies, although justified by the achievement of another valuable social goal, such as the protection of public health, interfere with individual freedom and autonomy and give rise to a number of ethical considerations [22].

The survey we conducted among students, parents and teachers found a categorical rejection of the compulsory vaccination for COVID-19. Such a categorical stance is understandable because mandatory vaccination violates the right to free choice, moreover, it implies the use of some form of coercion to have both parents and their children vaccinated.

Debating the problem of global ethical considerations regarding mandatory vaccination in children, Savulescu J, et al. (2021) note that vaccine mandates are fundamentally about restricting individual or parental freedom for the public good or for a child's own good. Coercion means that threats of penalties are used to restrict a person's options by making certain options (e.g., vaccine refusal for oneself or for one's child) significantly more costly. According to the authors, deciding whether to recommend that children receive a novel vaccine for a disease that is not a major threat to them or to mandate the vaccine requires precise information on the risks, including disease severity and vaccine safety and effectiveness, a comparative evaluation of the alternatives, and the levels of coercion associated with each. Also, mandatory vaccination programs could backfire by increasing people's hesitancy or distrust toward vaccines [2].

According to the WHO's recommendations, governments and institutional policy-makers should use arguments to encourage voluntary vaccination against COVID-19 before contemplating mandatory immunisation. Efforts should be made to demonstrate the benefit and safety of vaccines for the greatest possible acceptance of vaccination. Stricted regulatory measures should be considered only if these means are unsuccessful, provided all ethical considerations are considered and discussed [21].

LIMITATIONS

This was a small sample of school teachers, parents and students who responded to an e-mail invitation. This study focused on high school teachers, students and their parents. These findings might not be representative of elementary and middle school settings regarding the attitudes towards vaccination against COVID-19 among teachers and parents of children aged 5-11 years. The cross-sectional study outlines the snapshot of the analyzed data in the population sample for a specific period of time. This limits the survey's potential to establish long-term trends in vaccination attitudes among the target groups studied.

CONCLUSION

The present study was conducted in the context of a highly dynamic and changing public landscape associated with daily variations in the incidence of COVID-19, the introduction of non-traditional epidemic control measures such as the so-called green certificate, the mass rapid screening antigen tests in a school environment, as well as with the start of vaccination for children and youth up to 17 years of age. In this context, the presented results are of marked significance and contribute to establishing awareness, perceptions and attitudes about the prevention of COVID-19 among adolescents. Their views and ideas are compared and analyzed in relation to the position of two significant groups - parents and teachers. Established vaccination attitudes and factors influencing vaccine hesitancy should be considered when conducting future vaccination trials campaigns for immunoprophylaxis among adolescents.

The communication policy of state health institutions is decisive in stimulating the building of trust in information policies about coronavirus infection and the newly introduced methods of vaccine prophylaxis. However, the professional role of school nurses in the health promotion process should not be overlooked.

ACKNOWLEDGMENTS

The authors are grateful to the students, teachers and parents who participated in this study.

REFERENCES:

1. COVID-19 vaccines. EMA. 23 August 2023. [Internet]
2. Savulescu J, Giubilini A, Danchin M. Global Ethical Considerations Regarding Mandatory Vaccination in Children. *J Pediatr*. 2021 Apr;231:10-16. [PubMed]
3. Reiss DR, Caplan AL. Considerations in mandating a new Covid-19 vaccine in the USA for children and adults. *J Law Biosci*. 2020 May 8;7(1):lsaa025. [PubMed]
4. Plotkin SA, Levy O. Considering Mandatory Vaccination of Children for COVID-19. *Pediatrics*. 2021 Jun; 147(6):e2021050531. [PubMed]
5. Operational Guidance for K-12 Schools and Early Care and Education Programs to Support Safe In-Person Learning. CDC. Oct. 4, 2023. [Internet]
6. Ten threats to global health in 2019. WHO. 2019. [Internet]
7. COCONEL Group. A future vaccination campaign against COVID-19 at risk of vaccine hesitancy and politicization. *Lancet Infect Dis*. 2020 Jul;20(7):769-770. [PubMed]
8. Bell S, Clarke R, Mounier-Jack S, Walker JL, Paterson P. Parents' and guardians' views on the acceptability of a future COVID-19 vaccine: A multi-methods study in England. *Vaccine*. 2020 Nov 17;38(49):7789-7798. [PubMed]
9. [The vaccination. 7. Vaccination in children and young people.] [in Bulgarian] Covid-19 Unified Information Portal. [Internet]
10. Yigit M, Ozkaya-Parlakay A, Senel E. Evaluation of COVID-19 Vaccine Refusal in Parents. *Pediatr Infect Dis J*. 2021 Apr 1;40(4):e134-e136. [PubMed]
11. Duran S, Duran R, Acuna^o B, ahin EM. Changes in parents' attitudes towards childhood vaccines during COVID-19 pandemic. *Pediatr Int*. 2021 Jan-Dec;65(1):e15520. [PubMed]
12. Durmaz N, Suman M, Ersoy M, Örün E. Parents' Attitudes toward Childhood Vaccines and COVID-19 Vaccines in a Turkish Pediatric Outpatient Population. *Vaccines (Basel)*. 2022 Nov 18;10(11):1958. [PubMed]
13. Al-Zalfawi SM, Rabbani SI, Asdaq SMB, Alamri AS, Alsanie WF, Alhomrani M, et al. Public Knowledge, Attitude, and Perception towards COVID-19 Vaccination in Saudi Arabia. *Int J Environ Res Public Health*. 2021 Sep 25;18(19):10081. [PubMed]
14. MacDonald NE, SAGE Working Group on Vaccine Hesitancy. Vaccine hesitancy: definition, scope and determinants. *Vaccine*. 2015 Aug 14; 33(34):4161-4. [PubMed]
15. Stoitsova S, Dimitrova V, Georgieva I, Vladimirova N, Krumova S, Andonova I, et al. [Vaccine Hesitancy: Key Elements and Bulgaria's Place on the Global Map.] [in Bulgarian] *Medical Review*. 2021; 5 (4):17-25. [Internet]
16. Report of the SAGE Working Group on Vaccine Hesitancy. SAGE. 12 November 2014. [Internet]
17. Lazarus JV, Ratzan SC, Palayew A, Gostin LO, Larson HJ, Rabin K et al. A global survey of potential acceptance of a COVID-19 vaccine. *Nat Med*. 2020 Feb;27(2):225-228. [PubMed]
18. Denehy J. Measuring the outcomes of school nursing practice: showing that school nurses do make a difference. *J Sch Nurs*. 2000 Feb; 16(1):2-4. [PubMed]
19. Council on School Health. Role of the School Nurse in Providing School Health Services. *Pediatrics*. 2016 Jun;137(6):e20160852. [PubMed]
20. Guarinoni MG, Dignani L. Effectiveness of the school nurse role in increasing the vaccination coverage rate: a narrative review. *Ann Ig*. 2021 Jan-Feb;33(1):55-66. [PubMed]
21. COVID-19 and mandatory vaccination: ethical considerations and caveats: policy brief. WHO. 13 April 2021. [Internet]
22. Hristozova MV, Semerdjieva MA, Mavrov MS, Bakova DR. Compulsory vaccination against COVID-19 in the context of the principles of the convention on human rights and biomedicine. *Folia Med (Plovdiv)*. 2023 Feb 28; 65(1):111-115. [PubMed]

Please cite this article as: Tarnovska M, Petrova G, Avramova - Bakalova E. Hesitances about COVID-19 vaccination among students, teachers and parents. *J of IMAB*. 2024 Jul-Sep;30(3):5611-5618. [Crossref - <https://doi.org/10.5272/jimab.2024303.5611>]

Received: 07/02/2024; Published online: 01/07/2024



Author for correspondence:

Assoc. Prof. Gergana Petrova, PhD
Department of Nursing care, Faculty of Public Health, Medical University of Plovdiv;
15 A, V. Aprilov Blvd., Plovdiv-4002, Bulgaria,
E-mail: gergana.petrova@mu-plovdiv.bg