



Parental attitudes towards vaccination against COVID-19 of children 5–11 years old in Greece

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Abstract

Rationale: Vaccinating children against COVID-19 is critical to contain the ongoing pandemic.

Aims/Objectives: The aim of the present study was to assess parents' and caregivers' intention to vaccinate their 5–11 years old children against COVID-19 and to estimate the association between vaccination intention and sociodemographic, clinical and contextual factors.

Method: We conducted a questionnaire-based survey on a convenience sample of parents in Patras, Western Greece.

Results: Out of 366 study participants, around 48% reported their intention to vaccinate their child. The main factors associated with positive attitudes were paediatrician recommendation, parental vaccination, and reliance on the healthcare providers for decision making. Of note, 80% of the 190 parents who did not intend to vaccinate their children would vaccinate them if the paediatrician recommended it.

Conclusion: Interventions to further train healthcare professionals to establish rapport with parents, and to provide adequate information about vaccinations are crucial to address concerns related to COVID-19 vaccine benefits for children.

KEYWORDS

attitudes, child, COVID-19, parents, vaccination, vaccine hesitancy

1 | INTRODUCTION

Historically, despite the technological advancements in medicine, vaccination is considered the most effective strategy to reduce morbidity and mortality from infectious diseases, including coronavirus.^{1,2} Although the clinical symptoms of children infected with COVID-19 are milder than those of adults and mortality is rare, immunisation of children and adolescents is crucial to prevent serious complications such as the multisystem inflammatory syndrome in children (MIS-C) as well as to reach herd immunity thresholds and to gradually restore children's school and social

life.^{3–8} On 29 October 2021 and 25 November 2021, the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA) authorised the Pfizer-BioNTech COVID-19 vaccine for emergency use in children between 5 and 11 years of age, respectively.^{9,10} In the United States, by December 2021, more than two million children aged 5–11 years were infected with COVID-19, more than 8300 had been hospitalised and 209 had died.¹¹ Despite the growing evidence of the efficacy of COVID-19 vaccines in adults and the elderly, only 30%–63% of parents and caregivers reported their willingness to vaccinate their children against COVID-19.^{12,13} To date, about one in every four children

between 5 and 11 years has received at least one dose of the COVID-19 vaccine in the United States.¹⁴

Multiple factors ranging from individual socioeconomic and clinical factors, personal beliefs and attitudes towards vaccination, to social networks and spread of misinformation, have been identified as drivers of COVID-19 vaccination hesitancy among adults.^{15,16} The World Health Organization (WHO) had previously included vaccine hesitancy, described as the reluctance or refusal of vaccines, as one of the top 10 major threats to public health, even before the COVID-19 pandemic.¹⁷ Whether children get vaccinated depends on their parents. Although important research on COVID-19 vaccination and hesitancy has been conducted among adults, less is known about factors and reasons associated with parental decisions to vaccinate their children against COVID-19.^{3-8,12,13} Given the recent recommendations for vaccination of children aged 5–11 years, it is important to understand parents' decisions to vaccinate their children against COVID-19.

The aim of the present study was to assess parents' and caregivers' intention to vaccinate their offspring aged between 5 and 11 years against COVID-19 as well as factors associated with their intention in Greece.

2 | METHODS

2.1 | Study participants

We distributed an anonymous questionnaire to a convenience sample of parents and caregivers of children aged between 5 and 11 years old that were admitted to the two hospitals of Patras, the University General Hospital of Patras, and the Karamandaneio Children Hospital that provide services for children in the area of Western Greece (population coverage approximately 1,000,000 inhabitants, that is, one tenth of the Greek population). During the study period (December 2021 to January 2022), although the vaccine was available in the United States for use in the 5–11 age group, it was under approval in Greece and was finally recommended by the Hellenic Immunisation Committee at the end of December 2021.

The questionnaire was developed via a literature review^{3-8,12,13} and to ensure clarity, content validity and internal consistency, it was piloted with 20 parents/caregivers and adjusted accordingly. An overview of the study objectives was provided to potential participants and verbal consent was obtained. Parents of children with a previous history of COVID-19 were not included in the study. The questionnaire was administered face to face in the Greek language, and included 18 questions divided into two parts. The first part (11 questions) collected sociodemographic, contextual and clinical information. The second part (7 questions) assessed parental COVID-19 vaccine uptake, intention to vaccinate their child once the vaccine is approved, whether their paediatrician's recommendation would influence their decision, reasons for not intending to vaccinate their offspring as well as sources of information on vaccines. The study was approved by the Research Ethics Committee of the University of Patras, Greece (ID: 8135/01.09.21).

2.2 | Statistical analyses

We initially conducted a descriptive analysis to characterise the study participants overall and stratified by their intention to vaccinate their child. Statistically significant differences were evaluated using Fisher's exact test since all variables were categorical. To estimate the association between parental intention to vaccinate their child against COVID-19 and sociodemographic, contextual, and clinical factors, parental vaccination status, and paediatrician recommendation, we used a multivariable logistic regression model. We further included regional fixed-effects to control for unobserved, time-invariant differences. Standard errors were clustered at the area of residence. Statistical analyses were conducted in Stata version 17.0 (StataCorp).

3 | RESULTS

Out of 400 distributed questionnaires, 366 individuals agreed to participate and fully completed the questionnaire (response rate: 91.5%). Table 1 presents the descriptive characteristics of the population surveyed, further stratified by the intention to vaccinate their offspring against COVID-19. About 85% of participants reported having being vaccinated against COVID-19, and relied mostly on their paediatrician to decide whether to vaccinate their child(ren) against COVID-19 (53.0%). Among the 51.9% of the participants who did not intend to vaccinate their 5–11 years old, the most common reasons were fear of adverse events, vaccine effectiveness or an underlying medical comorbidity (43.2%; Table 2).

In the multivariable logistic regression analysis, the strongest factor associated with intention to vaccinate children was paediatrician recommendation (adjOR = 7.47, 95% confidence interval [CI]: 1.38–40.5, $p = 0.020$; Table 3). Single parents (adjOR = 1.36, 95% CI: 1.33–1.39, $p < 0.001$) and female respondents (adjOR = 1.22, 95% CI: 1.01–1.47, $p = 0.035$) were also more likely to intend to vaccinate their child. In contrast, the parental likelihood to vaccinate the child(ren) was inversely associated with having a child with self-perceived health status as being less than very good/excellent (adjOR = 0.51, 95% CI: 0.86–1.33, $p = 0.011$), with the parent not being vaccinated against COVID-19 (adjOR = 0.25, 95% CI: 0.17–0.36, $p < 0.001$), and reliance on sources other than the paediatrician on their decision to vaccinate their child (internet/TV/social media: adjOR = 0.12, 95% CI: 0.06–0.23, $p < 0.001$; Other: adjOR = 0.10, 95% CI: 0.04–0.23, $p < 0.001$).

4 | DISCUSSION

In this study, we found that the percentage of Greek parents who intended to vaccinate their children 5–11 years old was around 50%. Recommendation of vaccination by the paediatrician, reliance on the healthcare providers for decision making and parental vaccination against COVID-19 were the most prominent factors

**TABLE 1** Descriptive characteristics of the sample overall and stratified by intention to vaccinate their child for COVID-19.

	Will your child(ren) get vaccinated for COVID-19?			p
	All	No	Yes	
N	366	190	176	
%		51.9	48.1	
Gender				0.751
Male	41.8	42.6	40.9	
Female	58.2	57.4	59.1	
Age groups				<0.001
Less than 30	20.2	28.4	11.4	
30–39	39.6	37.4	42.0	
40 or more	40.2	34.2	46.6	
Education				<0.001
Less than University	36.3	45.8	26.1	
University or higher	63.7	54.2	73.9	
Income				<0.001
2000 or less	38	46.8	28.4	
2000–3000	32.2	29	35.8	
More than 3000	29.8	24.2	35.8	
Married				0.261
No	22.7	25.3	19.9	
Yes	77.3	74.7	80.1	
Unemployed				0.001
No	64.5	56.8	72.7	
Yes	35.5	43.2	27.3	
Rural				0.006
No	69.7	63.2	76.7	
Yes	30.3	36.8	23.3	
Number of children				0.138
One or two	70.0	66.3	73.9	
Three or more	30.0	33.7	26.1	
Children's health status				0.001
Very good/excellent	50.8	42.6	59.7	
Less than very good/excellent	49.2	57.4	40.3	
Any child with chronic conditions				0.725
No	72.7	73.7	71.6	
Yes	27.3	26.3	28.4	
Parental COVID-19 vaccination status				<0.001
Vaccinated	84.7	73.7	96.6	
Unvaccinated	15.3	26.3	3.4	

(Continues)

TABLE 1 (Continued)

	Will your child(ren) get vaccinated for COVID-19?			p
	All	No	Yes	
Would you vaccinate your child(ren) if the paediatrician recommended it?				<0.001
No	9.6	17.9	0.6	
Yes	90.4	82.1	99.4	
Factors affecting your decision to vaccinate the child(ren)?				<0.001
Paediatrician or other healthcare provider	53.0	26.3	81.8	
Internet/TV/social media	32.2	49.5	13.6	
Other (religion, politics, social interactions, personal beliefs)	14.8	24.2	4.6	

TABLE 2 Reasons not to vaccinate their child for COVID-19.

N	190
Reasons not to vaccinate your child(ren) for COVID-19	
Fear (short length of trials, adverse events, doubtful about effectiveness, child has a chronic condition)	43.2
COVID-19 is not dangerous for children	26.3
Religious reason	15.8
Other (i.e., vaccine serves other purposes)	14.7

associated with positive attitudes towards childhood vaccination in this age group.

The parental intention to vaccinate their offspring in our study is within the range of estimates reported in other studies which primarily assessed the overall intention to vaccinate all children, including those children >12 years old.⁶ Of note, intention to vaccinate children 5–11 years old, in a recently published study¹³ using a national sample of female guardians in the United States, was lower than in our study as well as previous findings for children above 12 years old.^{3–8} A possible explanation might be related to increased COVID-19 disease severity in teenagers compared to the milder disease in younger children, which might therefore lead to different vaccine uptake rates across heterogeneous age groups. Age-related variation in disease severity has been widely communicated with the general public throughout the pandemic via social media and other medical and nonmedical sources. However, parental informed decision making should be guided by healthcare authorities and clinical experts, rather than by individuals' self-perceived risks. Despite the fact that COVID-19 appears mild in the 5–11 years old age group, adequate disease prevention with immunisation will prevent rare but serious complications such as (MIS-C), will enable children to return to physical and other childhood activities and will provide broad societal benefits to the community via reduction in the virus circulation.

TABLE 3 Multivariable logistic regression estimates the factors associated with parental decision to vaccinate their children for COVID-19.

	aOR	95% CI	p
Would you vaccinate your child(ren) if the paediatrician recommended it?			
No	Ref.		
Yes	7.47	1.38–40.5	0.020
Gender			
Male	Ref.		
Female	1.22	1.01–1.47	0.035
Age groups			
30–39	Ref.		
Less than 30	0.92	0.60–1.40	0.702
40 or more	1.73	0.89–3.35	0.105
Education			
Less than University	Ref.		
University or higher	0.94	0.93–0.95	<0.001
Income			
2000 or less	Ref.		
2001–3000	1.71	0.54–5.42	0.365
More than 3000	1.65	0.78–3.50	0.188
Married			
Yes	Ref.		
No	1.36	1.33–1.39	<0.001
Unemployed			
No	Ref.		
Yes	0.94	0.70–1.28	0.704
Rural			
No	Ref.		
Yes	1.28	0.93–1.76	0.128
Number of children			
One or two	Ref.		
Three or more	0.73	0.46–1.15	0.128
Children's health status			
Very good/excellent	Ref.		
Less than very good/excellent	0.51	0.86–1.33	0.011
Any child with chronic conditions			
No	Ref.		
Yes	1.07	0.86–1.33	0.535
Parental COVID-19 vaccination status			
Vaccinated	Ref.		
Unvaccinated	0.25	0.17–0.36	<0.001

TABLE 3 (Continued)

	aOR	95% CI	p
Factors affecting your decision to vaccinate the child(ren)?			
Paediatrician or other healthcare provider	Ref.		
Internet/TV/social media	0.12	0.06–0.23	<0.001
Other (religion, politics, social interactions, personal beliefs)	0.10	0.04–0.23	<0.001

Abbreviations: aOR, adjusted odds ratio; CI, confidence interval.

As our findings suggest, recommendation to vaccinate their children from the paediatrician or another healthcare provider was the strongest determinant of positive vaccination intention in our study and has also been previously reported for the country.^{18,19} This is not surprising given the trusted relationship between families and paediatricians developed through frequent routine childhood visits to paediatricians who offer most primary and preventive care services for children in Greece. Recently, COVID-19 vaccines have been provided by the government and offered in paediatric offices rather than healthcare centres in an attempt to increase vaccine uptake. In accordance with our findings, effective, evidence-based messaging by trustworthy providers, rather than social media and social, political and religious interactions, has the potential to further convince more than 80% of parents who currently do not intend to vaccinate their child(ren) against COVID-19. This suggests a huge opportunity to address concerns, educate, and clarify misperceptions through targeted interventions across those currently not intending to vaccinate their children and to bolster vaccination uptake.

Our study is not without limitations. First, our sample is geographically restricted to parents from Western Greece and thus might not be generalisable across and outside the country. Second, our participants came from convenient sample of parents whose children have been admitted to hospital. Third, participation in our study was voluntary, therefore vaccine-hesitant parents may have decided not to participate, resulting in selection bias. Fourth, we did not specifically ask whether a family member had previously been affected by COVID-19 and had any complications which might have affected their attitude towards the vaccine. In addition, although “fear” (short length of trials, adverse events, doubtful about effectiveness, chronic condition), was the major cause of refusing COVID-19 vaccination but we did not perform a separate analysis for each one of these reasons grouped under the fear that would perhaps be more informative. Finally, we note that the intention to vaccinate does not necessarily reflect the actual vaccine uptake. Therefore, we cannot be certain of what parents would eventually do given the dynamic nature of the pandemic.



5 | CONCLUSION

In conclusion, about 50% of Greek parents intended to vaccinate their 5- to 11-year-old children against COVID-19. Vaccinated parents, paediatrician recommendations and advice, were the most prominent factors associated with the intention to vaccinate children. Interventions to further train healthcare professionals to establish rapport with parents, and to provide adequate information about vaccinations is crucial to address concerns related to COVID-19 vaccine benefits for children with important societal benefits.

ACKNOWLEDGEMENTS

The authors would like to thank all parents that have agreed to participate in the study.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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How to cite this article: Miliordos K, Giannouchos T, Steletou E, et al. Parental attitudes towards vaccination against COVID-19 of children 5–11 years old in Greece. *J Eval Clin Pract*. 2022;1-5. doi:10.1111/jep.13701