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ORIGINAL ARTICLE

Families' Opinions and Attitudes Regarding Routine and Non-Routine Childhood Vaccines

ABSTRACT

Objectives: The global increase in vaccine hesitancy is a complex phenomenon, leading to declining vaccination rates and a rise in vaccine-preventable childhood diseases. This survey aimed to assess parent' knowledge, beliefs, and attitudes towards hesitations or refusals of routine and non-routine childhood vaccinations.

Methods: Parents of children aged 6 months to 6 years who visited the pediatric outpatient clinic completed a structured questionnaire. This questionnaire assessed demographic characteristics (e.g., age, education, income, number of children) and their opinions and attitudes about vaccines.

Results: Out of 227 parents, 72.2% were mothers and 27.8% were fathers. Acceptance rates for routine vaccinations were 99.6% (n=226), while refusal stood at 0.4% (n=1). Hesitancy towards routine vaccines was at 11% (n=25), compared to 22.4% for non-routine vaccines. The predominant reasons parents hesitated regarding routine vaccines included concerns over safety (84%) and exposure to negative comments from media and their social circles (40%). Parents cited pediatricians (83.7% for routine, 90.7% for non-routine), family medicine nurses (60.8%, 17.6%), family physicians (35.7%, 24.7%), social media (9.3% for both), and friends/neighbors (5.3%, 7.5%) as their primary sources of information.

Conclusion: As vaccine hesitancy grows, concerted efforts and interventions could help mitigate its negative consequences for future generations. Physicians, especially pediatricians, nurses, and other healthcare professionals, are well-positioned to educate and guide parents on early childhood immunization.

Keywords: Childhood immunisation, opinion, parent, vaccine hesitancy

Immunization is one of the most successful public health interventions after access to clean water. Childhood vaccination programs aim to prevent vaccine-preventable infectious diseases, deaths, and sequelae they cause. Vaccination provides not only individual immunity but also herd immunity (1, 2). However, immunization coverage in most regions/countries of the world has plateaued in recent years and dropped since 2020. In recent years, the COVID-19 pandemic and associated disruptions have strained health systems, with 25 million children missing out on vaccination in 2021, 5.9 million more than in 2019 according to the World Health Organization (WHO) (3).

The "Extended Immunization Program" implemented in Türkiye is conducted by the Turkish Ministry of Health in family health centers free of charge. It reduces morbidity and mortality associated with hepatitis B, tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, pneumococcus, haemophilus influenzae type b, measles, rubella, mumps, chickenpox, and hepatitis A infections. According to the Health Statistic Year Book 2021 data, the rate of vaccination for each routine vaccine within the scope of the Turkish National Immunization Program has been reported to be 95-98%. However, based on the Turkish Population and Health Research 2018 data, considering both the vaccination card and the mother's statement, it appears that 67% of children aged 12-23 months have received all age-appropriate vaccinations in the first 23 months of life. Only 2% of children aged 12-23 months and 3% of children aged 24-35 months have never been vaccinated (4, 5).

Also, non-routine vaccines not within the scope of the Turkish national immunization program but recommended to be administered in childhood are the rotavirus vaccine, inacti-

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vated influenza vaccine, meningococcal ACWY vaccine, meningococcal B vaccine, and human papillomavirus (HPV) vaccine (6). On the other hand, during the COVID-19 pandemic, COVID-19 vaccines were administered to individuals aged 12-18 in Türkiye.

According to the World Health Organization (WHO) Strategic Advisory Group of Experts (SAGE) Working Group on Vaccine Hesitancy, vaccine hesitancy refers to a delay in acceptance or refusal of vaccination despite the availability of vaccination services, affecting one or more vaccines. Vaccine refusal is the act of not receiving all vaccinations by choice (7). The rising vaccine hesitancy worldwide leads to decreases in vaccination rates and increases in vaccine-preventable diseases. The number of families in Türkiye not wanting their children vaccinated was 183 in 2011, 980 in 2013, 5,400 in 2015, 12,000 in 2016, and 23,000 in 2018. While the incidence of measles was 0.01 per 100,000 population in 2016, it increased to 3.49 per 100,000 population. Similarly, an increase in cases has been reported by the WHO in the European region (8).

Multiple factors influence parental decision-making, including knowledge, sources of information, risk perception, trust, and individual experiences, among others. Common concerns underlying hesitancy include uncertainty about the need for vaccination and questions about vaccine safety and efficacy (9). Sociodemographic factors associated with parental vaccine hesitancy vary across locations and contexts. Studies on preventing vaccine hesitancy show that the most effective way to eliminate hesitations about vaccination is to establish good communication and trust between health workers and individuals. Utilizing mass media and social media to inform the public about vaccines and their effects has been found to reduce vaccine refusal (10). In our study, we aim to investigate parents' knowledge, beliefs, and attitudes towards hesitations/refusal of routine and non-routine childhood vaccinations.

MATERIALS AND METHODS

Study Design

This study has a descriptive research design. The study was conducted with volunteer parents (mother and/or father) of children aged 6 months to 6 years who visited pediatric outpatient clinics in two private hospitals in Ankara between May 2021 and February 2022. Participants joined voluntarily after being fully informed about the study. They signed an informed consent form and completed questionnaires that adhered to the Declaration of Helsinki protocols (World Medical Association). Ethical approval for this study was obtained from the Non-Interventional Studies' Ethics Committee of Yüksek Ihtisas University (decision no: 2020/13/01).

Data Collection and Procedures

The questionnaire was either emailed to families or provided in a written form. Families with multiple children were asked to answer the questions for the youngest child. The form included questions on the sociodemographic characteristics of the families, general vaccination information, their knowledge and attitudes about vaccines, and the reasons for vaccine hesitancy/refusal.

Statistical Analysis

The SPSS 22.0 statistical package program was used for statistical analysis in the study. Descriptive statistical methods (mean, standard deviation, frequency) were employed to evaluate the data. The chi-square test was used for comparing qualitative data. Results were evaluated at the 95% confidence interval, and the significance level was set at $p<0.05$.

RESULTS

Of the 227 parents who participated in the study, 72.2% (n=164) were mothers, and 27.8% (n=63) were fathers. Parental ages ranged between 23-44 years, with a mean age of 33.3 years. Among the parents, 91.2% (n=207) were employed, while 8.8% (n=20) were not. The working parents were primarily involved in the fields of education (25.6%), technology (24.2%), health (16.9%), finance (14%), and others (19.3%). The monthly household incomes of these families were as follows: less than 5,000 Turkish Liras (TL) for 19.8%, 5,001-10,000 TL for 35.7%, and over 10,000 TL for 44.5% of parents. Parents' educational levels were elementary-high school for 6.1%, university for 65.7%, and postgraduate for 28.2%. Additionally, 63.9% of parents had one child, 32.6% (n=74) had two children, and 3.5% (n=8) had three or more children (Table 1).

For the place of vaccination, parents reported at the health center (71.3%, n=162), private hospital (67%, n=152), university hospital (7.9%, n=18), state hospital (4%, n=9) and clinics (2.2%, n=5). For information sources of routine vaccines, parents reported pediatricians (83.7%, n=19), family medicine nurses (60.8%, n=138), family physicians (35.7%, n=81), social media (9.3%, n=21) and friends/neighbors (5.3%, n=12). When the parents were asked 'What do you do when you hear negative comments about routine vaccines? ', of

Table 1. Demographic Characteristics of Parents (n=227)

Age (years)	**Number (%)**
20-30	63 (27.8)
30-40	155 (68.2)
40 and more	9 (4.0)
Unemployed	20 (8.8)
Occupational group of employees	207 (91.2)
Education	53 (25.6)
Technology	50 (24.2)
Health	35 (16.9)
Finance	29 (14.0)
Other	40 (19.3)
Total monthly income of the family (Turkish Lira, ₺)	
Less than 5000	45 (19.8)
5001-10.000	81 (35.7)
More than 10.000	101 (44.5)
Parent's educational status	
Primary-high school graduate	14 (6.1)
University graduate	150 (65.7)
Postgraduate	63 (28.2)
The number of children:	
1	145 (63.9)
2	74 (32.6)
3 and above	8 (3.5)

the parents, 92.1% (n=210) said ' I ask a health worker', 55.5% said (n=126) 'I search online', 7% (n=16) said 'I ask a friend' and 5.3% (n=12) said ' I ask a relative or family member'.

For routine vaccines, the vaccination accepting rate was 99.6% (n=226) and the vaccine rejection rate was 0.4% (n=1). The rate of the vaccine hesitancy rate was 11% (n=25). The rate of hesitation in getting routine vaccines was 44% (n=11) in the conjugated pneumococcal vaccine, 32% (n=8) in oral polio vaccine, 32% (n=8) in pentavalent vaccine (diphtheria, acellular pertussis, tetanus, inactivated polio, haemophilus influenza type b), 28% (n=7) in MMR (mumps, measles, rubella) vaccine, 20% (n=5) in BCG vaccine, 20% (n=5) in hepatitis b vaccine, 16% (n=4) in measles vaccine, and 16% (n=4) in varicella vaccine.

When parents were asked about their opinions on routine vaccines, 96.5% (n=219) oft he parents said they are necessary, 88.1% (n=184) of those said they strengthen the immune system and 85.5% (n=194) of those said vaccinations can protect their children from infections and their effects. Of the parents, 54.6% (n=124) did not believe in anything other than vaccines to avoid vaccine-preventable infectious diseases and 85% (n=193) believed that they could also protect other individuals in the community from infections with vaccination. Of the parents, 69.6% (n=158) stated that the presence of unvaccinated individuals around their children made them worried (Table 2). 'I did not think it was safe' (84%) and 'I heard/read negative comments from the media and my environment' (40%) were the most stated reasons that caused hesitation for routine vaccines (Table 3).

For information sources of non-routine vaccines, parents stated pediatricians (90.7%, n=206), family physicians (24.7%, n=56), family medicine nurses (17.6%, n=40), friends/neighbors (7.5%, n=17) and social media (9.3%, n=21). For non-routine vaccines, of the parents, 72.7% (n=165) stated as 'necessary', 70.9% (n=161) as 'effective', 67% (n=152) as 'safe'. Of the parents, 37.9% (n= 86) said that the presence of individuals around their children who did not receive any non-routine vaccinations made them worried. The rate of hesitation about non-routine vaccines was 22.4% (n=51). Vaccination rates were 81.1% (n=184) in the rotavirus vaccine, 54.2% (n=123) in meningococcal ACWY vaccine, 44.1% (n=100) in meningococcal B vaccine and 5.3% (n=12) in influenza vaccine. When parents asked which non-routine vaccines should be included in routine vaccines, 91.2% (n=207) said rotavirus vaccine, 81.5% (n=185) said meningococcal ACWY, 77.1% (n=175) said meningococcal B, 44.9% (n=102) said influenza vaccine and 5.3% (n=12) said HPV vaccine. The most common statements for not getting a non-routine vaccine were 'I don't think it is safe' (39.2%, n=20), 'I think that the vaccines are

Table 2. Parents' Opinions About Routine Vaccines

	Yes n (%)	No n (%)	Undecided n (%)
Do you think routine vaccines are necessary?	219 (96.5)	3 (1.3)	5 (2.2)
Do you think that vaccines strengthen the immune system?	200 (88.1)	3 (1.3)	24 (10.6)
Do you think you can protect your children against infections and their effects with vaccines?	194 (85.5)	9 (4.0)	24 (10.6)
Do you believe that there is another way of preventing vaccine-preventable diseases?	40 (17.6)	124 (54.6)	63 (27.8)
Do you think that vaccinating your child can protect other individuals in the community from infections?	193 (85)	9 (4.0)	25 (11.0)
Does the presence of any individual who did not receive any routine vaccine around your child make you nervous?	158 (69.6)	48 (21.1)	21 (9.3)

Table 3. The Rates and Causes of Hesitations in Routine (n=25) and Non-Routine Vaccines (n=51)

	Routine vaccines n (%)	Non-routine vaccines n (%)
I didn't think it was necessary.	3 (12)	15 (29.4)
I didn't think it was effective.	2 (8)	4 (7.8)
I didn't think it was safe.	21 (84)	20 (39.2)
I had bad experience with the previous vaccinator.	0 (0)	1 (1.9)
I had a fear of needles.	2 (8)	1 (1.9)
Another person described a bad experience with the vaccine.	2 (8)	3 (5.8)
I have heard/read negative comments from the media and my environment.	10 (40)	8 (15.6)
I did not trust the health worker I received health care.	1 (4)	0 (0.0)
I think natural infection provides better immunity.	3 (12)	3 (5.8)
I believe in alternative/complementary or traditional medicine.	5 (20)	2 (3.9)
I think vaccines are commercial.	7 (28)	19 (37.2)
I was hesitant to have it because of my religious beliefs.	2 (8)	1 (1.9)

commercial' (37.2 %, n=19), 'I don't think it is necessary' (29.4%, n=15) (Table 3).

Of the parents, 89.9% (n=204) stated that they are worried about their children and themselves for getting a coronavirus infection and 49.8% (n=13) stated that they had or want to have the coronavirus vaccine and 29.5% (n=67) wanted their children to have coronavirus vaccine.

DISCUSSION

In our study, the rate of full vaccination for routine vaccines was 99.6% and the rate of vaccination for each routine vaccine, which is within the scope of the Turkish National Immunization Program has been reported to be 95-98% (4, 5). Vaccination rates in the world vary according to country and it is around 70-80% in Afghanistan, Pakistan, Nigeria, and India and it is generally over 90% in Europe and America (11). In a study conducted in Ankara in 2018 with 903 parents, the rate of full immunization was found 97.6% and this high rate was attributed to the fact that Ankara is the capital city and the education level of parents is above the national average (12). In that study, 95.1% of the parents stated that the vaccines were protective and this rate was found 85.5% in our study.

In our study, the rate of vaccine hesitancy for routine vaccines was found 10.1%. The rate of hesitation in getting routine vaccines was the most high in the conjugated pneumococcal vaccine. Among parents who were hesitant about vaccines, 'I didn't think it was safe' (39.2%) and 'I heard/read negative comments from the media and my environment' (40%) were the most common reasons for routine vaccines, while 'I did not think it was safe" (8.8%) and 'I think the vaccines are commercial' (8.4%) were the most given answers for non-routine vaccines. In a study from Australia, it was reported that of parents 35.9% were afraid of vaccine side effects, 35.9% were suspicious of vaccine efficacy and 23.1% were distrustful of the pharmaceutical industry (13).

Gellin et al. (14) reported that 25% believed that their child's immune system could become weakened as a result of too many immunizations, and 23% believed that children get more immunizations than are good for them in the United States with a nationally representative sample. Also, they found that the source of information about vaccination was stated by parents to be the doctor with a rate of 84% while 83.7% of parents in routine vaccines and 90.7% of parents in non-routine vaccines stated that pediatricians were the most important source of information in our study. Healthcare professionals especially pediatricians, family physicians and nurses are a most important source for getting to reliable information and encouraging approaches regarding both routine and non-routine vaccines.

The rate of hesitation about non-routine vaccines was 22.4%. In our study, the highest rate of administration among non-routine vaccines was in the oral rotavirus vaccine and this was attributed to the absence of pain factor (one of the most important factors causing vaccine hesitancy). The least preferred non-routine vaccine was the influenza vaccine. There is a perception among parents that mortality and morbidity associated with influenza are less and it is not necessary for children. Nonetheless, rate of the parental awareness of children with a special risk medical condition more higher than those of all children (15).

Bates et al. (16) reported that the socioeconomic environment, education, and economic status of the family affect the vaccination rate. In a study conducted in Ankara and Adıyaman in 2019, Topçu et al. (17) found that monthly income and education level were lower in those who refused vaccination. Aygün et al. (18) evaluated vaccine hesitancy with the WHO's vaccine hesitancy Likert scale in their study in Istanbul, and they did not find a significant difference in the vaccine hesitancy levels of the participants according to age, the number of children, education level and seminar attendance. In anti-vaccine approaches, it has been reported that in low-middle-income countries, vaccine rejection increases as education level decreases, while in high-income countries, vaccine rejection increases as education increases (1).

Broniatowski et al. (19) suggest that seeing all vaccine refusals/undecideds as a homogeneous group reduces the success of strategies. Communication strategies adapted to the characteristics of the persons and their attitudes toward the vaccine may be more effective (19, 20). The profiles of parents who are having vaccine refusal or hesitancy in Türkiye are not fully known. Therefore considering the differences between all these subgroups, it was thought that the structure and views of the parents who applied to the private hospital would contribute to understanding the vaccine rejection and hesitation. In addition, monitoring data at subnational levels is important to helping countries prioritize and tailor vaccination strategies and operational plans to manage immunization gaps and reach every child with life-saving vaccines (3).

CONCLUSION

Vaccines can prevent sequelae and loss of life, and educating families about these vaccines and related disease complications is paramount. In light of the growing vaccine hesitancy, concerted efforts and measures can potentially curb this trend, ensuring a safer future for the next generation. Physicians, especially pediatricians, along with nurses and other healthcare professionals, are in a unique position to educate and motivate parents regarding early childhood immunization. Engaging in non-confrontational and open dialogues, and fostering a strong and trusting relationship between parents and providers, are pivotal for establishing a solid foundation for vaccine acceptance.

Ethics Committee Approval: Ethical approval for this study was obtained from the Non-Interventional Studies' Ethics Committee of Yüksek Ihtisas University (decision no: 2020/13/01).

Informed Consent: Written informed consent was obtained from the patients who agreed to take part in the study.

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REFERENCES

1. Dubé E, Vivion M, MacDonald NE. Vaccine hesitancy, vaccine refusal and the anti-vaccine movement: Influence, impact and implications. Expert Rev Vaccines 2015;14(1):99-117. [CrossRef]
2. Fine P, Eames K, Heymann DL. Herd immunity: A rough guide. Clin Infect Dis 2011;52(7):911-6. [CrossRef]

3. WHO. Immunization coverage. Available at: https://www.who.int/news-room/fact-sheets/detail/immunization-coverage. Accessed July 12, 2023.
4. Turkish Population and Health Research. Available at: https://fs.hacettepe.edu.tr/hips/dosyalar/Araştırmalar%20-%20raporlar/2018%20TNSA/TNSA2018_ana_Rapor_compressed.pdf. Accessed July 12, 2023 [Article in Turkish].
5. Ministry of Health. Health Statistics Year Book 2021. Available at: https://dosyasb.saglik.gov.tr/Eklenti/45317,siy2021-ingilizcepdf.pdf?0. Accessed July 16, 2023.
6. Arısoy ES, Çiftçi E, Hacımustafaoğlu M, Kara A, Kuyucu N, Somer A, et al. Clinical practical recommendations for Turkish national vaccination schedule for previously healthy children (national vaccination schedule) and vaccines not included in the schedule 2015. J Pediatr Inf 2015;9:1-11. [CrossRef]
7. Report of the SAGE Working Group on vaccine hesitancy. Available at: http://www.who.int/immunization/sage/meetings/2014/october/1_Report_WORKING_GROUP_vaccine_hesitancy_final.pdf. Accessed July 16, 2023.
8. Ministry of Health. Health Statistics Year Book 2019. Available at: https://sbsgm.saglik.gov.tr/Eklenti/40566/0/health-statistics-yearbook-2019pdf.pdf. Accessed July 16, 2023.
9. Cataldi JR, O'Leary ST. Parental vaccine hesitancy: Scope, causes, and potential responses. Curr Opin Infect Dis 2021;34(5):519-26. [CrossRef]
10. Gür E. Vaccine hesitancy - vaccine refusal. Turk Pediatri Ars 2019;54(1):1-2.
11. WHO. Immunisation analysis and insights. Avaliable at: https://www.who.int/teams/immunization-vaccines-and-biologicals/immunization-analysis-and-insights/surveillance. Accessed July 16, 2023.
12. Kara SS, Polat M, Yayla BC, Demirdag TB, Tapisiz A, Tezer H, et al. Parental vaccine knowledge and behaviours: A survey of Turkish families. East Mediterr Health J 2018;24(5):451-8. [CrossRef]
13. Sandhofer MJ, Robak O, Frank H, Kulnig J. Vaccine hesitancy in Austria: A cross-sectional survey. Wien Klin Wochenschr 2017;129(1-2):59-64. [CrossRef]
14. Gellin BG, Maibach EW, Marcuse EK. Do parents understand immunizations? A national telephone survey. Pediatrics 2000;106(5):1097-102. [CrossRef]
15. Tuckerman J, Crawford NW, Marshall HS. Disparities in parental awareness of children's seasonal influenza vaccination recommendations and influencers of vaccination. PLoS One 2020;15(4):e0230425. [CrossRef]
16. Bates AS, Wolinsky FD. Personal, financial and structural barriers to immunization in socioeconomically disadvantaged urban children. Pediatrics 1998;101(4):591-6. [CrossRef]
17. Topçu S, Almış H, Başkan S, Turgut M, Orhon FŞ, Ulukol B. Evaluation of childhood vaccine refusal and hesitancy intentions in Turkey. Indian J Pediatr 2019;86(1):38-43. [CrossRef]
18. Aygün E, Tortop HS. Investigation of Parents' Vaccine Hesitation Levels and Reasons of Vaccine Refusal. Güncel Pediatri 18(3):300-16. [CrossRef]
19. Broniatowski DA, Hilyard KM, Dredze M. Effective vaccine communication during the disneyland measles outbreak. Vaccine 2016;34(28):3225-8. [CrossRef]
20. Lafnitzegger A, Gaviria-Agudelo C. Vaccine hesitancy in pediatrics. Adv Pediatr 2022;69(1):163-76. [CrossRef]