

Evaluation of Families' Attitudes, Knowledge, and Behaviours About Childhood Special Vaccines in Turkey and Comparison of Sociodemographic Characteristics

Türkiye’de Çocukluk Çağı Özel Aşıları Konusunda Ailelerin Tutum, Bilgi ve Davranışlarının Değerlendirilmesi ve Spesifik Özelliklerinin Karşılaştırılması

Serra Alçı¹, Derun Torlak², Fulya Coşkunol³

1. SBÜ Ümraniye Eğitim ve Araştırma Hastanesi
<https://orcid.org/0000-0002-9592-6716>

2. Acıbadem Şinasi Can Hastanesi Yenidoğan Ünitesi
<https://orcid.org/0000-0002-1970-5911>

3. Özel Hekim (Fulya Coşkunol Muayenehanesi Alsancak İzmir)
<https://orcid.org/0000-0003-0021-6154>

Abstract

Introduction: The vaccination schedule for infants is determined by the Ministry of Health, and there are routine vaccinations that should be given to infants.

Aim: In this study, we aimed to evaluate families' attitudes, knowledge, and behaviors about rotavirus, meningococcal, and HPV vaccines that are not in the vaccination schedule and to compare them socio-demographically.

Methods: This study investigated the vaccination status of 150 children aged 0 to 15 years brought to the pediatrics outpatient clinic of Ümraniye Training and Research Hospital and Acıbadem Şinasi Can Hospital. Attitudes and knowledge behaviors of families about rotavirus, meningococcal, and HPV vaccines, which are not in the vaccination calendar of the Ministry of Health, were evaluated, and their sociodemographic behaviors were controlled. The data collected from the mothers through questionnaires are presented as a descriptive analysis.

Results: Of 57.3% of the mothers who applied to Ümraniye State Hospital did not vaccinate their children against rotavirus, and 80% of the mothers who applied to Acıbadem Hospital had their children vaccinated against rotavirus. Of 70.9% of the mothers who applied to Ümraniye State Hospital stated that they did not have meningitis vaccination, and 67.1% of those who applied to Acıbadem Hospital stated that they had vaccination (p:0.000). Almost half of the (49.4%) of the mothers who applied to Ümraniye State Hospital stated that they had not heard the word HPV virus, but 79.7% of the mothers who applied to Acıbadem Hospital stated that they had heard the word HPV virus (p:0.000).

Conclusion: Regarding the outcomes of this research, one can state that there are socio-demographic and behavioral differences in families who applied to private or state hospital.

Keywords: Vaccination, Meningitis, Rotavirus, Human Papillomavirus (HPV), Family Attitude.

Özet

Giriş: Bebeklere yönelik aşı takvimi Sağlık Bakanlığı tarafından belirlenmekte olup, bebeklere yapılması gereken rutin aşılar bulunmaktadır.

Corresponding Author: Serra Alçı, e-mail: serraalci@gmail.com

Received: 01.09.2023, **Accepted:** 15.10.2023, **Published Online:** 20.12.2023

Cite: Alçı S, et al. Evaluation of Families' Attitudes, Knowledge, and Behaviours About Childhood Special Vaccines in Turkey and Comparison of Sociodemographic Characteristics. Acta Medica Ruha. 2023;1(4):511-522. <https://doi.org/10.5281/zenodo.10004368>



Amaç: Bu çalışmada ailelerin aşılama takviminde yer almayan rotavirüs, meningokok ve HPV aşılama ilişkili tutum, bilgi ve davranışlarını değerlendirmeyi ve bunları sosyodemografik olarak karşılaştırmayı amaçladık.

Yöntem: Bu çalışmada Ümraniye Eğitim ve Araştırma Hastanesi ve Acıbadem Şinasi Can Hastanesi Çocuk Sağlığı ve Hastalıkları Polikliniği'ne getirilen 0-15 yaş arası 150 çocuğun aşı durumları araştırıldı. Ailelerin Sağlık Bakanlığı aşı takviminde yer almayan rotavirüs, meningokok ve HPV aşılama ilişkili tutum ve bilgi davranışları değerlendirilerek sosyodemografik davranışları kontrol edildi. Annelerden anket yoluyla toplanan veriler betimsel analiz olarak sunulmuştur.

Bulgular: Ümraniye Devlet Hastanesi'ne başvuran annelerin %57,3'ü çocuklarına rotavirüs aşısı yaptırmadı, Acıbadem Hastanesi'ne başvuran annelerin %80'i çocuklarına rotavirüs aşısı yaptırdı. Ümraniye Devlet Hastanesi'ne başvuran annelerin %70,9'u menenjit aşısı yaptırmadığını belirtirken, Acıbadem Hastanesi'ne başvuran annelerin %67,1'i aşı yaptırdığını belirtti (p:0.000). Ümraniye Devlet Hastanesi'ne başvuran annelerin neredeyse yarısı (%49,4) HPV virüsü kelimesini duymadığını belirtirken, Acıbadem Hastanesi'ne başvuran annelerin %79,7'si HPV virüsü kelimesini duyduğunu belirtmiştir (p:0.000).

Sonuç: Bu araştırmanın sonuçlarına bakıldığında özel veya devlet hastanesine başvuran ailelerde sosyodemografik ve davranışsal farklılıklar olduğu söylenebilir.

Anahtar Kelimeler: Aşı, Menenjit, Rotavirüs, İnsan Papilloma Virüsü (HPV), Aile Tutumu.

INTRODUCTION

Vaccines protect children vulnerable to infections, as their immune system is not yet developed. Infectious diseases that caused infant and child deaths in the past have decreased significantly with vaccination today. In our country, the vaccination schedule for infants is determined by the Ministry of Health, and there are routine vaccinations that should be given to infants. Apart from routine vaccines, some vaccines are not included in the mandatory vaccine list of the Ministry of Health but are recommended (1).

Rotavirus is a very contagious and severe disease. It shows symptoms such as diarrhea, vomiting, and fever in infants. It causes severe bodily fluid loss due to excessive vomiting and diarrhea. When severe fluid loss occurs in children, they are hospitalized, and intravenous fluid support is provided. Child deaths due to rotavirus continue to occur in unvaccinated children worldwide (2). The vaccine is a live virus vaccine administered orally. Rotavirus vaccine is available in two brands administered in 2 or 3 doses (Rotateq-MSD, five components, three doses. Rotarix-GSK, one component, two doses). The first dose of the vaccine should be given to babies between 6 – 15 weeks, and the last dose should not exceed 32 weeks. The last dose should be given by the end of the 8th month (3).

Meningococcal infections can cause bacteremia (germ in the blood) and meningitis, which can be dangerous and cause death. permanent damage occurs. Although our country's annual incidence and age distribution are unknown, it is considered ten times higher than in Europe. There is scientific data, albeit limited, that meningococcal disease is more common in children under two years of age (4). Conjugated meningococcal vaccine is also a strong immunogen in children under two years of age, the immunity provided is long-term, and immune memory is formed. Vaccination is routinely applied to different age groups in many countries (such as England, Greece, USA, China), and it is made within our country's scope of special vaccination. Two types of meningococcal vaccine are available. The first is the one containing the meningococcal A, C, Y, W (Nimenrix-Pfizer, Menactra-Sanofi Pasteur, Menveo-GSK) bacterial types, and the second is the meningococcal B (Bexsero-GSK) bacterial type. The 4-valent conjugated meningococcal vaccine can be administered between 6 – 12 weeks, depending on the age at which the first dose is administered, determined during the licensing phase of different brands. The application schedule of the following doses is determined according to the age at which the first dose is administered and the total vaccine doses are completed.

The meningococcal group B vaccine has been licensed and started to be applied in Turkey in November 2018 (5).

After discovering the relationship between HPV and cervical cancer, HPV vaccines have been produced and applied since 2007 due to extensive research on this virus. The main purpose of using HPV vaccines is the prevention of cervical cancer. One is quadrivalent, i.e. four strains, and the other is bivalent, containing two. Both vaccines protect against cervical cancer, and the vaccine containing four strains also protects against genital warts. Vaccinations are recommended, especially between 10 – 25 (6).

As a result, preventive medicine is much more important than treatment after the disease occurs, especially in infants and children, who can be provided with vaccines before the disease occurs (7). This study is a descriptive analysis of the questionnaire application, which does not include any treatment protocol, to evaluate families' attitudes, knowledge, and behaviors about rotavirus, meningococcal, and HPV vaccines that are not in the vaccination schedule and to compare them sociodemographically.

METHODS

In this study, the vaccination status of children aged 0 to 15 years who were brought to the general pediatrics outpatient clinic of Ümraniye Training and Research Hospital and Acıbadem Şinasi Can Hospital with various complaints between April 1 and July 1, 2022, missed opportunities in vaccination administration, factors affecting vaccination, and special vaccines. Attitudes and knowledge behaviors of families about rotavirus, meningococcal, and HPV vaccines, which are not in the vaccination calendar of the Ministry of Health, were evaluated, and their sociodemographic behaviors were controlled. The data collected from the mothers through questionnaires are presented as a descriptive analysis.

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from our institution in 31/03/2022, and informed consent has been obtained from all participants.

Statistical Analysis

Patient data collected within the scope of the study were analyzed with the IBM Statistical Package for the Social Sciences (SPSS) for Windows 26.0 (IBM Corp., Armonk, NY) package program. Frequency and percentage for categorical data and mean and standard deviation for continuous data were given as descriptive values. For comparisons between groups, the “Independent Sample T-test” was used for two groups, and the “Pearson Chi-Square Test” was used to compare categorical variables. The results were considered statistically significant when the p-value was less than 0.05.

Within the scope of the study, it was aimed to examine the private vaccination information of mothers who applied to Acıbadem Hospital and Ümraniye State Hospital. For this purpose, together with the demographic characteristics of the mothers, Vaccine approaches and findings on specific vaccine information are discussed. Chi-square results were analyzed to test the relationship between mothers who applied to Acıbadem Hospital and Ümraniye State Hospital and vaccination approaches, and the relationship between mothers who applied to Acıbadem Hospital and Ümraniye State Hospital and specific vaccination information and approach.

G*Power 3.1.9.4 program was used to calculate the sample size of the study. When calculations were made with a medium effect level of 0.5, a power of 80%, and a type 1 error margin of 0.05, it was revealed that 135 questionnaires should be applied. Considering the 10% probability of data loss during the study, it was decided to include 150 cases (75 study group, 75 control).

RESULTS

Within the scope of the analysis, when the demographic characteristics of the mothers who applied to Ümraniye State Hospital were examined, 50.6% of the mothers were between the ages of 24-30, and 43.5% had secondary education; 89.5% of the parents live together, 74.1% of the mothers do not work, 63.1% of the parents have income equal to their expenses, 94.1% live in the city center, 47.1% have two children and 53.9% were girls. On the other hand, when the demographic characteristics of the mothers who applied to Acıbadem Hospital were examined, 67.1% of mothers were older than 31 years old, 88% had higher education, 73% of the parents lived together, 80.8% of the mothers work, 53.4% of the parent's income is equal to their expenses, 94.5% live in the city center, 78.4% have an only child, and It was concluded that 51.4 of them were girls.

When it was questioned where mothers had their children routinely vaccinated, it was concluded that there was a statistically significant relationship between mothers who applied to Ümraniye State Hospital and Acıbadem Hospital ($p:0,000$). While 67.5% of mothers who applied to Ümraniye State Hospital stated that they had their children vaccinated in family medicine, 71.2% of the mothers who applied to Acıbadem Hospital stated that they had their child vaccinated in a private health institution (private hospital, private doctor).

It was concluded that there was a statistically significant relationship between the mothers and their children who did not receive all vaccinations ($p:0,001$). However, 72.7% of mothers who applied to Ümraniye State Hospital could not vaccinate their children due to financial reasons; 30% of mothers who applied to Acıbadem Hospital stated that they could not vaccinate their children because they forgot. It was observed that 73.4% of the mothers who applied to Ümraniye State Hospital and 76% of those who applied to Acıbadem Hospital knew that the state did not pay for the vaccines they bought from the pharmacy ($p:0,008$). Additionally, 67.9% of the mothers who applied to Ümraniye State Hospital and 85.3% of those who applied to Acıbadem Hospital stated that they were informed about special vaccines from any health institution health worker or doctor ($p:0.017$).

Of 57.3% of the mothers who applied to Ümraniye State Hospital did not have their children vaccinated against rotavirus, but 80% of the mothers who applied to Acıbadem Hospital had their children vaccinated against rotavirus ($p:0,000$). 70.9% of the mothers who applied to Ümraniye State Hospital stated that they did not have meningitis vaccination, and 67.1% of those who applied to Acıbadem Hospital stated that they had vaccination ($p:0,000$). Hence, 88.5% of the mothers who applied to Ümraniye State Hospital stated that they did not have Bexsero done, but 55.6% of the mothers who applied to Acıbadem Hospital stated that they had Bexsero inoculation ($p:0.000$).

Almost half of the (49.4%) of the mothers who applied to Ümraniye State Hospital stated that they had not heard the word HPV virus, but 79.7% of the mothers who applied to Acıbadem Hospital stated that they had heard the word HPV virus ($p:0.000$). It was concluded that there was a statistically significant difference between the knowledge that the HPV virus causes cervical cancer and the mothers who applied to Ümraniye State Hospital and Acıbadem Hospital ($p:0.010$). Additionally, 51.9% of the mothers who applied to Ümraniye State

Hospital stated that they knew this, but 68.9% of the mothers who applied to Acıbadem Hospital did not know. It was concluded that 50% of the mothers who applied to Ümraniye State Hospital did not have a smear test regularly, but 49.3% of the mothers who applied to Acıbadem Hospital had it done several times irregularly (p:0.001). While 50.8% of mothers who applied to Ümraniye State Hospital defended the idea that it should be done for all girls who have reached a certain age, 46.7% of mothers who applied to Acıbadem Hospital think that it should be applied to both girls and boys who have reached a certain age (p:0.001). While 44.7% of the mothers who applied to Ümraniye State Hospital stated that they could not have it done because they did not have the financial means; 70% of the mothers who applied to Acıbadem Hospital stated that they did not have the vaccine because they did not know (p:0,003).

Table 1. Distribution of Demographic Characteristics of Individuals by Groups

| | | Patients | | | |
|---|--|--------------|-------------|------------|-------------|
| | | Ümraniye TRH | | Acıbadem H | |
| | | n | % | n | % |
| 2. Her age when she became a mother (categorical) | 16-23 | 28 | 34,6 | 3 | 4,1 |
| | 24-30 | 41 | 50,6 | 21 | 28,8 |
| | Over 31 years old | 12 | 14,8 | 49 | 67,1 |
| 3. Maternal education level | Illiterate | 0 | 0,0 | 0 | 0,0 |
| | Literate | 5 | 5,9 | 1 | 1,3 |
| | Primary | 10 | 11,8 | 1 | 1,3 |
| | Secondary | 37 | 43,5 | 7 | 9,3 |
| | HigherEducation | 33 | 38,8 | 66 | 88,0 |
| 4. Are the parents together? Do they live in the same house? | Mom and Dad Together | 77 | 89,5 | 54 | 73,0 |
| | Parents divorced | 4 | 4,7 | 12 | 16,2 |
| | The parents are married but live in different places | 1 | 1,2 | 1 | 1,4 |
| | With grandparents | 4 | 4,7 | 7 | 9,5 |
| 5. Mother's working status | They work | 22 | 25,9 | 59 | 80,8 |
| | Nonoperating | 63 | 74,1 | 14 | 19,2 |
| 6. Economic situation | Income is lower than expense | 21 | 25,0 | 8 | 11,0 |
| | Income equals expense | 53 | 63,1 | 39 | 53,4 |
| | Income is higher than expense | 10 | 11,9 | 26 | 35,6 |
| 7. Place of residence | Downtown | 80 | 94,1 | 69 | 94,5 |
| | Rural | 5 | 5,9 | 4 | 5,5 |
| 8. Number of children alive | Only child | 26 | 30,6 | 58 | 78,4 |
| | 2 siblings | 40 | 47,1 | 15 | 20,3 |
| | 3 siblings | 14 | 16,5 | 1 | 1,4 |
| | Number of children 4 and more | 5 | 5,9 | 0 | 0,0 |
| 10. Gender of the child | Daughter | 41 | 53,9 | 37 | 51,4 |
| | Male | 35 | 46,1 | 35 | 48,6 |

Table 2. The Relationship Between Individuals' Vaccine Approach and the Group

| | | Patients | | | | Chi-square | p-value |
|---|---|--------------|------|------------|------|---------------|---------------|
| | | Ümraniye TRH | | Acıbadem H | | | |
| | | n | % | n | % | | |
| 11. Have you had your child vaccinated against the routine health ministry calendar? | Yes | 81 | 97,6 | 70 | 93,3 | 1,686 | 0,258 |
| | No | 2 | 2,4 | 5 | 6,7 | | |
| 12. Where did you get your child routine vaccinations? | Abroad | 0 | 0,0 | 3 | 4,1 | 81,770 | 0,000* |
| | Mother and child health center | 20 | 24,1 | 2 | 2,7 | | |
| | Family medicine | 56 | 67,5 | 15 | 20,5 | | |
| | Public Hospital | 0 | 0,0 | 1 | 1,4 | | |
| | Private health institution (private hospital, private doctor) | 7 | 8,4 | 52 | 71,2 | | |
| 13. If you haven't had all the vaccinations for your children, what's the reason? | Material reasons | 16 | 72,7 | 1 | 10,0 | 15,117 | 0,001* |
| | inability to find time | 1 | 4,5 | 1 | 10,0 | | |
| | Don't forget | 0 | 0,0 | 3 | 30,0 | | |
| | Distance to health institutions | 1 | 4,5 | 1 | 10,0 | | |
| | Not informing or not being informed by health institutions | 4 | 18,2 | 3 | 30,0 | | |
| | I'm anti-vaccine | 0 | 0,0 | 1 | 10,0 | | |
| 14. Would you recommend getting vaccinated to those around you? | Yes | 80 | 96,4 | 70 | 94,6 | 2,050 | 0,418 |
| | No | 0 | 0,0 | 2 | 2,7 | | |
| | I don't know | 3 | 3,6 | 2 | 2,7 | | |
| 15. Do you think the vaccine is useful? | Very helpful | 65 | 79,3 | 55 | 73,3 | 3,802 | 0,426 |
| | It might be a little helpful | 10 | 12,2 | 14 | 18,7 | | |
| | Not helpful at all | 0 | 0,0 | 0 | 0,0 | | |
| | Damaging | 0 | 0,0 | 1 | 1,3 | | |
| | No idea | 5 | 6,1 | 5 | 6,7 | | |
| | I think only domestic vaccines are useful | 2 | 2,4 | 0 | 0,0 | | |
| 16. Who do you think is protected by vaccination? | Me | 2 | 2,4 | 16 | 27,1 | 32,407 | 0,000* |
| | Society | 17 | 20,5 | 1 | 1,7 | | |
| | Me and society | 61 | 73,5 | 35 | 59,3 | | |
| | I don't know | 3 | 3,6 | 6 | 10,2 | | |
| | No one | 0 | 0,0 | 1 | 1,7 | | |
| 17. Do you think you have been adequately informed about the vaccine by the Ministry of Health? | Yes | 41 | 48,2 | 19 | 25,7 | 9,822 | 0,007* |
| | No | 19 | 22,4 | 30 | 40,5 | | |
| | Insufficient | 25 | 29,4 | 25 | 33,8 | | |
| 18. Are you calling from your health care provider that the vaccination is being followed on time in accordance with the schedule? | Yes | 68 | 80,0 | 51 | 68,0 | 13,344 | 0,001* |
| | No | 13 | 15,3 | 6 | 8,0 | | |
| | Irregular | 4 | 4,7 | 18 | 24,0 | | |

*p<0,05. TRH: Training & Research Hospital.

Table 3. The Relationship Between Individuals' Special Vaccination Knowledge and Approach and the Group

| | | Patients | | | | Chi-square | p-value |
|---|--|--------------|------|------------|------|---------------|---------------|
| | | Ümraniye TRH | | Acıbadem H | | | |
| | | n | % | n | % | | |
| 19. Do you have any ideas about special vaccines? | I know there are vaccines we buy from the pharmacy that the government does not pay. | 58 | 73,4 | 57 | 76,0 | 9,323 | 0,008* |
| | I have no idea, noone has mentioned it before | 18 | 22,8 | 7 | 9,3 | | |
| | Other | 3 | 3,8 | 11 | 14,7 | | |
| 20. Have you informed any health institution or health worker or your doctor about special vaccines? | Yes | 57 | 67,9 | 64 | 85,3 | 5,727 | 0,017* |
| | No | 27 | 32,1 | 11 | 14,7 | | |
| 21. Have you had your child get the rotavirus vaccine? | Yes | 23 | 28,0 | 60 | 80,0 | 42,611 | 0,000* |
| | No | 47 | 57,3 | 11 | 14,7 | | |
| | I do not know what it is | 12 | 14,6 | 4 | 5,3 | | |
| 22. Do you know the disease caused by rotavirus? | Yes | 48 | 57,8 | 59 | 79,7 | 7,664 | 0,006* |
| | No | 35 | 42,2 | 15 | 20,3 | | |
| 23. I didn't get my child vaccinated for rotavirus because? | No one told me to do it | 26 | 47,3 | 9 | 64,3 | 3,033 | 0,233 |
| | I heard that the vaccine is harmful | 8 | 14,5 | 3 | 21,4 | | |
| | I couldn't afford to have this vaccine. | 21 | 38,2 | 2 | 14,3 | | |
| 24. If you had the rotavirus vaccine, in which months did you have it? | 2nd and 3rd Month | 7 | 21,9 | 13 | 27,7 | 24,583 | 0,000* |
| | 3rd and 4th Months | 11 | 34,4 | 0 | 0,0 | | |
| | 4th and 5th Months | 2 | 6,3 | 0 | 0,0 | | |
| | 5th and 6th Months | 1 | 3,1 | 1 | 2,1 | | |
| | I can't remember | 11 | 34,4 | 33 | 70,2 | | |
| 25. Have you had the rotavirus vaccine? | Rotateq | 5 | 23,8 | 7 | 13,5 | 1,166 | 0,308 |
| | Rotarix | 16 | 76,2 | 45 | 86,5 | | |
| 26. Where did you get the rotavirus vaccine? | Family medicine | 12 | 46,2 | 6 | 10,2 | 16,868 | 0,000* |
| | My private practice doctor | 4 | 15,4 | 9 | 15,3 | | |
| | Public Hospital | 1 | 3,8 | 0 | 0,0 | | |
| | Private hospital | 9 | 34,6 | 44 | 74,6 | | |
| 27. Have you been informed about the rotavirus vaccine by the institutions affiliated to the Ministry of Health when the time comes? | Yes | 24 | 38,1 | 31 | 43,1 | 0,342 | 0,601 |
| | No | 39 | 61,9 | 41 | 56,9 | | |
| | Irregular | 0 | 0,0 | 0 | 0,0 | | |
| 28. I wast old by ... that I should have the rotavirus vaccine? | My private doctor | 21 | 37,5 | 45 | 69,2 | 18,501 | 0,000* |
| | State Hospital Doctor | 17 | 30,4 | 4 | 6,2 | | |
| | Family Physician | 16 | 28,6 | 11 | 16,9 | | |
| | Other | 2 | 3,6 | 5 | 7,7 | | |
| 29. Do you know what meningitis is, have you heard of it before? | Yes | 65 | 80,2 | 46 | 62,2 | 6,188 | 0,043* |
| | No | 3 | 3,7 | 5 | 6,8 | | |

| | | | | | | | |
|---|--|----|------|----|------|---------------|---------------|
| | I have no idea exactly but I heard | 13 | 16,0 | 23 | 31,1 | | |
| 29.1. Have your child had the meningitis vaccine? | Yes | 21 | 26,6 | 49 | 67,1 | 39,155 | 0,000* |
| | No | 56 | 70,9 | 15 | 20,5 | | |
| | I do not know what it is | 2 | 2,5 | 9 | 12,3 | | |
| 30. I didn't do it because? | No one told me to do it | 21 | 38,9 | 11 | 50,0 | 3,763 | 0,168 |
| | I heard that the vaccine is harmful | 4 | 7,4 | 4 | 18,2 | | |
| | I could not afford to have this vaccine. | 29 | 53,7 | 7 | 31,8 | | |
| 31. If you had the meningitis vaccine, in which months did you have it? | First dose in the first 6 months | 2 | 7,1 | 26 | 54,2 | 19,773 | 0,000* |
| | First dose between 6-12 months | 6 | 21,4 | 3 | 6,3 | | |
| | after 1 year | 5 | 17,9 | 7 | 14,6 | | |
| | I can't remember | 15 | 53,6 | 12 | 25,0 | | |
| 32. Have you had the meningitis vaccine? | Menactra | 6 | 28,6 | 2 | 3,6 | 10,258 | 0,007* |
| | nimenrix | 6 | 28,6 | 21 | 37,5 | | |
| | Menveo | 0 | 0,0 | 0 | 0,0 | | |
| | I can't remember | 9 | 42,9 | 33 | 58,9 | | |
| 33. Have you had a Bexsero done? | Yes | 7 | 11,5 | 40 | 55,6 | 26,184 | 0,000* |
| | No | 54 | 88,5 | 32 | 44,4 | | |
| 34. Have you been informed about Bexsero? | Yes | 13 | 19,4 | 46 | 64,8 | 29,012 | 0,000* |
| | No | 54 | 80,6 | 25 | 35,2 | | |
| 35. Where did you get the meningitis vaccine? | Family Medicine | 13 | 43,3 | 3 | 6,1 | 33,347 | 0,000* |
| | My private practice doctor | 4 | 13,3 | 6 | 12,2 | | |
| | Public Hospital | 6 | 20,0 | 0 | 0,0 | | |
| | Private hospital | 7 | 23,3 | 40 | 81,6 | | |
| 36. Did you inform the Ministry of Health about the meningitis vaccine when the time came? | Yes | 26 | 34,2 | 17 | 23,0 | 1,798 | 0,180 |
| | No | 50 | 65,8 | 57 | 77,0 | | |
| 37. I was told by ... that I should get the meningitis vaccine? | My private doctor | 14 | 23,7 | 52 | 89,7 | 57,247 | 0,000* |
| | Public hospital doctor | 27 | 45,8 | 3 | 5,2 | | |
| | Family medicine | 18 | 30,5 | 3 | 5,2 | | |
| 38. Have you heard the word HPV virus before? | Yes | 36 | 44,4 | 59 | 79,7 | 34,211 | 0,000* |
| | No | 40 | 49,4 | 5 | 6,8 | | |
| | I've heard but I don't know what it is | 5 | 6,2 | 10 | 13,5 | | |
| 39. Do you know that HPV virus causes cervical cancer? | Yes | 39 | 48,1 | 51 | 68,9 | 6,852 | 0,010* |
| | No | 42 | 51,9 | 23 | 31,1 | | |
| 40. Do you regularly have a smear test? | Yes | 23 | 29,5 | 15 | 21,1 | 13,864 | 0,001* |
| | No | 39 | 50,0 | 21 | 29,6 | | |
| | I've had it done a few times | 16 | 20,5 | 35 | 49,3 | | |
| 41. Do you know that there is | Yes | 25 | 30,9 | 51 | 68,0 | 21,496 | 0,000* |

| | | | | | | | |
|---|---|----|------|----|------|--------|--------|
| a vaccine for HPV, that is, cervical cancer? | No | 56 | 69,1 | 24 | 32,0 | | |
| 42. Have you been informed by a health care provider about the HPV vaccine before? | Yes | 14 | 17,5 | 15 | 20,0 | 0,037 | 0,847 |
| | No | 66 | 82,5 | 60 | 80,0 | | |
| 43. Do you think HPV virus only occurs in women? | only in women | 41 | 63,1 | 32 | 42,7 | 5,813 | 0,018* |
| | women and men | 24 | 36,9 | 43 | 57,3 | | |
| 44. Who do you think should be vaccinated against HPV Virus? | For men and women of reproductive age | 7 | 10,8 | 3 | 4,0 | 15,475 | 0,001* |
| | Only for women in there productive period | 6 | 9,2 | 18 | 24,0 | | |
| | All girls of a certain age | 33 | 50,8 | 19 | 25,3 | | |
| | For both boys and girls of a certain age | 19 | 29,2 | 35 | 46,7 | | |
| 45. Do you know that girls and boys who are 9 years old should be vaccinated against HPV? | Yes | 21 | 26,6 | 17 | 22,7 | 0,142 | 0,707 |
| | No | 58 | 73,4 | 58 | 77,3 | | |
| 46. Have you had or will you have your child vaccinated against HPV? | I had it - I will do it | 30 | 47,6 | 42 | 60,0 | 3,111 | 0,208 |
| | I didn't - I woul dn't | 11 | 17,5 | 6 | 8,6 | | |
| | No idea | 22 | 34,9 | 22 | 31,4 | | |
| 47. I didn't get my child vaccinated against HPV because I woul dn't? | I don't have the financial strength | 21 | 44,7 | 3 | 10,0 | 14,977 | 0,003* |
| | I don't believe in vaccine | 1 | 2,1 | 2 | 6,7 | | |
| | I don't know the vaccine | 15 | 31,9 | 21 | 70,0 | | |
| | I do not approve of this vaccine being given to children who are not ready to reproduce at their age. | 5 | 10,6 | 1 | 3,3 | | |
| | Other | 5 | 10,6 | 3 | 10,0 | | |

*p<0,05

DISCUSSION

Immunization is an easy-to-apply, low-risk, effective, and inexpensive public health practice in preventing and eradicating communicable diseases and reducing infant/child mortality. The high rate of infectious disease despite vaccination in society is because the vaccination rates of infants/children are not at the desired level. To raise healthy generations, it is necessary to protect public health. The number of under-vaccinated children worldwide and in our country is too high to be underestimated (8).

In our country, vaccination has become an increasing problem in recent years. In 2015, it showed a rapid increase in twinning the "consent from the parents for the vaccine" case and the frequent use of anti-vaccine discourses in the media. The number of families who do not want to have their children vaccinated, which was 183 in 2011, increased to 980 in 2013, to 5400 in 2015, to 12.000 in 2016, and the number of cases of vaccine refusal reached 23.000 in 2018. The vaccination rate, which was 98% in 2016, decreased to 96% in 2017 (9). According to TDHS (Turkey Demographic and Health Survey-2013) data, it was determined as 76.4%. The percentage of regular vaccinations under the age of two was higher, similar to the TDHS data (10).

In field studies conducted in Turkey that questioned the level of non-routine vaccine knowledge of families, it was observed that two-thirds of the parents did not know any non-routine vaccines and those with knowledge knew influenza, measles, and meningitis vaccines in the first place (11, 12). Especially in the media, bringing up the chronically ill or elderly patients who are not vaccinated due to influenza causes the perception that this vaccine is unnecessary in the pediatric age group. For this reason, the importance of pediatric influenza vaccination in public health should be better communicated, and positive attitudes of the public and health workers towards vaccination should be supported (13). Regarding the outcomes of our research, families who applied to private hospital had forgot to vaccinate their children. In contrast, mothers who applied to state hospitals could not have their children inoculated with non-routine vaccines due to financial problems.

When the literature is examined, it was reported in a study conducted in Ankara in 2015 that 97.5% of parents received information about vaccination from health institutions (14). In a study conducted by Kürtüncü et al. on the level of knowledge of mothers about the vaccination status of their children, it was reported that 64.4% of mothers received information about vaccination from midwives (32.8%) and nurses (32.2%) (15). In another study, nearly half of the parents stated that the source of vaccine information is health personnel (16). In the study, 90.7% of the mothers received information about vaccines from the health personnel, 60.1% of the parents did not know what the vaccine was given to their child, and 64.8% of the parents who knew what the vaccine was were midwives. / stated that they learned from nurses (17). In our study about two thirds of the mothers that applied to state hospital and almost 9 out of 10 mothers knew that the vaccines were not reimbursed. A majority of the parameters favored mothers who brought their children to private hospital rather than the state hospital. As mentioned in previous literature, in Turkey low-low- income status, education, and having more children were important downsides of vaccine attributes of families.

In studies conducted in Turkey, the rate of parents' knowledge of non-routine vaccines varies between 40 – 70%, and the most frequently administered non-routine vaccines were rotavirus and influenza vaccines (11, 12, 15). In studies conducted in Turkey in 2013 and 2019, HPV vaccine awareness was 40% and 30%, respectively (17, 18). In various studies conducted in Turkey, parents' education level, employment status/occupation, and income level were reported as factors affecting non-routine vaccination (11,12,16). In our study, while 78.7% but 79.7% of the mothers who applied to Acibadem Hospital stated that they had heard the word HPV virus, this was only 49.4%. The awareness of HPV causing cervical cancer was also higher in mothers applying to private hospital.

The effects of low education and income levels and having many children on vaccination were observed, and it was concluded that parents did not have enough information about vaccinations. Generally, it has been observed that parents prefer to learn about vaccination information from health centers, and it has been concluded that it is important to provide more detailed information about immunization in health institutions, and that it is important for health professionals to meet the correct information with parents. It should not be forgotten that parents' compliance with extended immunization programs can be achieved by increasing their knowledge about vaccines and diseases and that parents are a part of immunization.

CONCLUSIONS

Regarding the outcomes of this research, one can state that there are socio-demographic and behavioral differences in families who applied to private or state hospital.

Funding: There is no specific funding related to this research.

Competing Interest: The authors did not experience any conflict of interest in the writing of this article.

Institutional Review Board Approval: Ethics committee approval was granted from our institution in 2022 with protocol number B.10.1.THK.4.34.H.GP.0.01/18

Informed Consent: All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2008. Ethics committee approval has been granted from our institution.

Author Contributions

| | |
|---|--------------|
| Working Concept / Design | : SA, DT, FC |
| Data collecting | : SA, DT, FC |
| Data Analysis / Interpretation | : SA, DT, FC |
| Writing Draft | : SA, DT, FC |
| Technical Support / Material Support | : SA, DT, FC |
| Critical review of content | : SA, DT, FC |
| Literature Review | : SA, DT, FC |

REFERENCES

1. Anderson EJ, Daugherty MA, Pickering LK, et al. Protecting the Community Through Child Vaccination. *Clin Infect Dis.* 2018;67(3):464-471. doi: 10.1093/cid/ciy142
2. LeClair CE, McConnell KA. Rotavirus. 2023 Jan 2. In: StatPearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2023 Jan-. PMID: 32644377.
3. Ballard SB, Gilman RH. Post-Rotavirus Vaccine Enteropathogen Landscape. *Pediatr Rev.* 2023;44(3):182-184. doi: 10.1542/pir.2022-005565
4. Daraghma R, Sapra A. Meningococcal Vaccine. 2023 Jun 21. In: StatPearls [Internet]. Treasure Island (FL): Stat Pearls Publishing; 2023 Jan-. PMID: 31971742.
5. López-Lacort M, Muñoz-Quiles C, Orrico-Sánchez A. Meningococcal Group B Vaccine (4CMenB) in Children. *N Engl J Med.* 2023 Jun 1;388(22):2109. doi: 10.1056/NEJMc2303518
6. Bennett C, Edwards D, Sherman SM, et al. Which interventions improve HPV vaccination uptake and intention in children, adolescents and young adults? An umbrella review. *Sex Transm Infect.* 2022;98(8):599-607. doi: 10.1136/sextrans-2022-055504
7. Williamson AL. Recent Developments in Human Papillomavirus (HPV) Vaccinology. *Viruses.* 2023;15(7):1440. doi: 10.3390/v15071440
8. O'Connor D. The omics strategy: the use of systems vaccinology to characterize immune responses to childhood immunization. *Expert Rev Vaccines.* 2022;21(9):1205-1214. doi: 10.1080/14760584.2022.2093193
9. Halk Sağlığı genel müdürlüğü. Available from: https://hsgm.saglik.gov.tr/dosya/mevzuat/genel_nitelikli_yazilar/asi_db/10._avrupa_asi_haftasi_fe8d0.d. (Accessed date: 27.12.2021).
10. Hacettepe Üniversitesi. "Türkiye Nüfus ve Sağlık Araştırması 2013", www.hips.hacettepe.edu.tr/TNSA2013/rapor/TNSA_2013_ara_rapor_pdf/ (Erişim Tarihi: 23 Ocak 2018).
11. Özdemir IN, Kadioğlu H. Validity and reliability of Turkish version of vaccination confidence scale for parents. *Florence Nightingale J Nurs.* 2020;28(1):41-8.
12. Çıklar S, Güner PD. Knowledge, behavior, and attitude of mother's about childhood immunization and reasons of vaccination rejection and hesitancy: a study of mixed methodology. *Ankara Med J.* 2020;20(1):180-95.

13. Hood N, Flannery B, Gaglani M, et al. Influenza Vaccine Effectiveness Among Children: 2011-2020. *Pediatrics*. 2023;151(4):e2022059922. doi: 10.1542/peds.2022-059922
14. Taşar MA, Daller YB. “Ankara’da sosyoekonomik düzeyi düşük olan bölgede kaçırılmış aşı fırsatlarının irdelenmesi”, *TAF Preventive Medicine Bulletin*. 2015;14(4): 279-283.
15. Kürtüncü M, Alkan I, Bahadır Ö, et al. Zonguldak’ın kırsal bir bölge sinde yaşayan çocukların aşılanma durumu hakkında annelerin bilgi düzeyleri. *Ejovoc*. 2017;7(1):8-17.
16. Kalarikkal SM, Jaishankar GB. Influenza Vaccine. 2023 Mar 30. In: *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan–. PMID: 30725882.
17. Üzüm Ö, Eliaçık K, Örsdemir HH, et al. Ebeveynlerin aşı yaklaşım larını etkileyen faktörler: bir eğitim araştırma hastanesine ilişkin değer lendirme. *J Pediatr Infect*. 2019;13(3):144-9.
18. Özyer S, Uzunlar O, Özler S, et al. Aware ness of Turkish female adolescents and young women about HPV and their attitudes towards HPV vaccination. *Asian Pac J Cancer Prev*. 2013;14(8):4877-81.
19. Altinel Açoğlu E, Oğuz MM, Şenel S. Ebeveynlerin HPV Aşısı hakkındaki bilgi düzeyleri ve yaklaşımları. *Turkish J Pediatr Dis*. 2019;13(2):78-82.
20. Taddio A, McMurtry CM, Logeman C, et al. Prevalence of pain and fear as barriers to vaccination in children - Systematic review and meta-analysis. *Vaccine*. 2022;40(52):7526-7537. doi: 10.1016/j.vaccine.2022.10.026