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Doctors' Knowledge, Perspectives, and Actions Regarding Vaccinations for Children Those Are Not Included in the Recommended Vaccination Schedule in Saudi Arabia 2024

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ABSTRACT

Background: In Saudi Arabia, the Ministry of Health (MOH) provides a recommended vaccination schedule for children, which includes essential vaccines for public health. However, there are vaccines that are not included in this national schedule but may be indicated in certain cases, such as the Human Papillomavirus (HPV) vaccine, rotavirus vaccine, or vaccines for travelers. It is important to understand family doctors' knowledge, attitudes, and practices regarding these non-scheduled vaccines, as they play a crucial role in vaccination decision-making. **The study aims:** To assess the knowledge, perspectives, and actions of family doctors regarding vaccines for

children not included in the recommended immunization schedule in Saudi Arabia. **Method:** Descriptive cross-sectional study was carried out between January and March 2024. A sample size is calculated with 5% margin of error and 95% confidence interval; it turns out to be 381. A questionnaire prepared by scanning the literature and including socio-demographic characteristics was presented to the participants. The Likert scale, which includes questions about rotavirus, meningococcal, HPV and vaccines developed for these microorganisms, was administered to physicians either face-to-face or via the internet. The statistical significance level was accepted as $P < 0.05$, and the SPSS statistical package program was used in the calculations. **Results:** The mean age of the participating physicians was 37.96 ± 9.3 (min: 25 and max: 68). 50.9% of the physicians were women, 79.8% were married, 85.1% were in the city center, and 62.1% were practicing family medicine as general practitioners. 74.82% of the participating physicians recommend rotavirus and 56.2% HPV vaccines to their patients. 10.6% of the physicians participating in this study did not recommend any of the rotavirus, HPV, meningococcal, influenza and adult pertussis vaccines to their patients. In the evaluation of the reason for this, 58.7% of physicians who did not recommend special vaccines state that they did not recommend vaccines because they are not included in the routine vaccination schedule of the Ministry of Health. Another important reason was that the vaccines are paid (30.4%). To the question of having sufficient information about special vaccines that are not included in the routine vaccination schedule, 26% of the participants stated that they have sufficient knowledge, and 56.5% stated that they have partial knowledge. The Likert knowledge questions total score of those who recommended at least one vaccine to their patients was significantly higher than those who did not recommend it at all. Likert knowledge questions total score of those who had at least one vaccination was significantly higher than those who never had it ($P = 0.001$). **Conclusion:** In general, as the level of knowledge about private vaccines decreases, the rates of self-vaccination, recommending it to their patients, and asking it to be included in the national vaccine schedule decrease. For this reason, increasing the knowledge of physicians about vaccines not included in the national vaccination schedule will contribute to the dissemination of vaccines, thus increasing immunity and reducing mortality and morbidity.

KEYWORDS: Family doctors, knowledge, perspectives, actions and vaccination

Introduction

Vaccines are essential in preventing infectious diseases and are a cornerstone of public health programs worldwide [1]. In Saudi Arabia, the Ministry of Health (MOH) provides a recommended vaccination schedule that outlines the vaccines to be administered to children at various stages of development [2]. However, some vaccines, such as the Human Papillomavirus (HPV) vaccine, rotavirus vaccine, and vaccines for specific diseases like meningitis, are not part of the national schedule but may still be beneficial for individual children depending on factors such as risk exposure or travel [3, 4]. Family doctors, being the primary healthcare providers for children, are central to decision-making about vaccines [5]. Their knowledge, attitudes, and actions

regarding vaccines outside the national schedule are critical in ensuring that children receive the appropriate protection [6].

Moreover, a biological substance called a vaccination aids in establishing immunity against a particular illness. The vaccine is typically made from attenuated or dead forms of the microbe, its toxins, or related surface proteins and contains components that are similar to those of disease-causing bacteria. By stimulating the immune system, the vaccine helps the body recognize the material as alien, eliminate it, and remember it for future encounters. In this manner, the immune system will recognize the bacteria when it comes into contact with them again, making it simpler to combat and ultimately eliminate them [7].

National immunization programs are currently in use in many countries across the world, having been adjusted to comply with the guidelines set forth by agencies like the World Health Organization (WHO). The Ministry of Health is in charge of KSA's standard immunization program. Our nation's national immunization program currently includes vaccines against hepatitis A and B, poliomyelitis, measles, rubella, mumps, TB, diphtheria, pertussis, tetanus, varicella, conjugated pneumococcus, and hemophilus influenza type B [8]. In addition to these vaccines, there are other vaccines that are licensed for use but are not part of the national vaccination program, such as the influenza virus, rotavirus, meningococcus, and human papillomavirus (HPV) [8].

Rotavirus is one of the leading causes of severe pediatric diarrhea in the world, causing ~125 000–200 000 deaths in children under 5 years of age each year [9-11]. Although the rotavirus burden has decreased considerably in the last decade, it still accounts for the majority of diarrheal deaths in children younger than 5 years of age and is associated with 130 000 deaths annually. Rotavirus was the third leading pathogen associated with death in 2016, after malaria and pneumonia. Approximately 40% of children younger than 5 years of age experienced rotavirus diarrhea in 2016, with large differences in incidence and mortality of this infection between high-income and low-income countries [9].

Anogenital and oropharyngeal infections in both men and women can be caused by the HPV virus, which is one of the sexually transmitted illnesses. Permanent infections can occur with high-risk HPV genotypes, and nearly all cervical malignancies progress in this manner. Globally, high-risk HPV genotypes 16 and 18 are accountable for about 70% of cervical cancer cases. HPV types 31, 33, 45, 52, and 58 are responsible for 20% of the other types. Furthermore, 90% of anal cancers and a sizable percentage of oropharyngeal, vulvar, vaginal, and penile cancers are caused by HPV types 16 and 18. Additionally, 90% of anogenital warts are caused by HPV strains 6 and 11 [12].

The prevalence of HPV types 16 and 18 has been reported to be 4.7%, and the prevalence of HPV in cervical cancer has been reported as 67.6% [13]. Vaccines have been developed to prevent the acquisition of HPV infection and to prevent HPV-related dis- eases that may develop afterward [12]. Meningococcal diseases, especially meningococcal meningitis, are one of the most devastating diseases for a society or an individual. Neisseria meningitid is generally affects healthy young individuals and is a microorganism that can cause death within hours [12, 13]. Therefore, this study aims to determine the level of knowledge, attitudes and behaviors of family doctors related to vaccines that are not included in the national vaccination schedule in Saudi Arabia.

Material and Method

A descriptive cross-sectional study was carried out between January and March 2024. A sample size is calculated with 5% margin of error and 95% confidence interval; it turns out to be 381. A 15-question questionnaire prepared by scanning the literature and including socio-demographic characteristics was presented to the participants. The Likert scale, which includes 19 questions about rotavirus, meningococcal, HPV and vaccines developed for these microorganisms, was administered to physicians either face-to-face or via the internet. The statistical significance level was accepted as $P < 0.05$, and the SPSS statistical package program was used in the calculations.

Ethics committee approval was obtained for the study from the Clinical Research Ethics Committee of Ministry of Health, KSA. A 21-question questionnaire prepared by scanning the literature, including socio-demographic characteristics, was applied to the participants after their consent. A questionnaire consists of 6 questions in which socio-demographic characteristics are questioned, 13 items in which attitudes and behaviors are evaluated and 19 statements and 2 information questions aiming to measure the level of knowledge about these vaccines. The Cronbach alpha value of our questions was calculated as 0.845, and it is quite strong. The Likert scale, which includes 19 questions about rotavirus, meningococcus, HPV and vaccines developed for these microorganisms, was administered to physicians either face-to-face or via the internet.

In this study, socio-demographic characteristics and independent variables were determined and asked about age, gender, marital status, place of work and accordingly title, duration of work, having a child, vaccination status for their children, self-vaccination status, and the status of recommending vaccination to their patients. As dependent variables, the status of recommending the vaccine to their patients and their belief that the vaccine should be included in the national vaccination schedule were determined and asked to the participants.

SPSS 28.0 analysis program was used to evaluate the data. Descriptive statistics are presented as mean (±) standard deviation, median (min-max), frequency distribution and percentage. Chi-square test or Fisher's exact test was used to compare categorical variables. When a significant difference was detected in comparisons with at least one variable having more than 2 categories, the groups were compared in pairs to determine the source of the difference, and correction was applied to identify the groups with difference. Conformity of continuous variables to normal distribution was examined using visual (histogram and probability charts) and analytical methods (if $n \geq 50$; Kolmogorov-Smirnov test, if $n < 50$; Shapiro-Wilk test).

For the variable found to fit the normal distribution, Student's t- test was used for statistical significance between two independent groups. One-way ANOVA was used as a statistical method among three or more independent groups found to have a normal distribution. Tukey or Tamhane's T2 test results were used according to the homogeneity of the variances of the groups in post hoc multiple comparisons to determine the source of the significant differences between three or more independent groups. Statistical significance level was accepted as $P < 0.05$.

Results

The mean age of 377 family physicians participating in this study was 37.96 ± 9.3, and the median was 36 (min: 25 and max: 68). Of the physicians, 50.9% were women, 79.8% were married, 85.1% were in the city center, and 62.1% were practicing family medicine as general practitioners. The length of service of physicians in the profession was 12.54 ± 9.30 (min: 1 and max: 40).

Table (1) shows distribution of vaccines recommended by physicians. Of the participants, 74.8% were recommended rotavirus, 67.9% were recommended Meningococcus, and 56.2% were recommended HPV. Most recommended another vaccine was the influenza vaccine with 59.4%. Most stated reasons for not recommending the vaccine were not being in the routine vaccination scheme of the Ministry of Health (58.7%), while the second most stated reason was paid for the vaccines (30.4%).

Table (1): Physicians' vaccination status

	n	%
Vaccination status (n = 377)		
Vaccinated with at least one vaccine	207	54.9
Never vaccinated	170	45.1
Own vaccination status (n = 377)		
Influenza	173	45.9
Meningococcus	42	11.1
HPV	31	8.2
Adult pertussis	11	2.9
None of them	170	45.1
Thinking about getting vaccinated (n = 214)		
Yes	100	46.7
No	114	53.3
Distribution of vaccines they are planning to do(n = 100)		
HPV	62	62.0
Influenza	54	54.0
Meningococcus	43	43.0

	n	%
Adult pertussis	14	14.0
Reasons for not getting vaccinated for those who do not have any vaccinations (n = 118)		
I did not have it done because the ministry of health is not in the routine vaccination scheme.	52	44.1
I didn't get it done because I missed the time (Influenza)	32	27.1
I didn't do it because it's paid	24	20.3
I didn't believe in its protection	15	12.7
I didn't do it because of the side effects	14	11.9
I didn't have enough information about vaccines	10	8.5

Table (2) shows the distribution of the participants' knowledge about specific vaccines. Of the participants, 274 had children, and 42.3% vaccinated their children for Rotavirus, 33.6% for Meningococcus, and 24.5% for Influenza. Only 8% of the physicians vaccinated their children against HPV, and 36.9% of them did not vaccinate their children with any special vaccines. Of the 103 physicians who do not have children stated that if they had a child, 84.5% of them would vaccinate for Rotavirus, 78.6% for Meningococcus, 66.0% for HPV, and 52.4% for influenza. While only 26.0% of the participants stated that they had sufficient knowledge about special vaccines, 56.5% stated that they had partial knowledge.

Table (2): Distribution of participants' knowledge of specific vaccines

	n	%
The state of thinking that you have enough knowledge about specific vaccines (n = 377) #		
Yes, I Have Enough Knowledge	98	26.0
I have partial knowledge	213	56.5
No, I Don't Have Enough Knowledge	66	17.5
Where to obtain information for those who have sufficient knowledge about specific vaccines (n = 247) #		
Guidelines	139	56.3
In-service training	137	55.5

	n	%
Congresses	81	32.8
Social media	48	19.4
Television	3	19.4
Places where those who do not have enough information about special vaccines want to get information (n = 266) #		
In-service training	236	88.7
Congresses	144	54.1
Social media	30	11.3
Television	11	4.1
I do not want to receive information	4	1.5
The earliest and latest weeks of administration of the first dose of rotavirus vaccines. (n = 346) #		
The earliest is 4 weeks. the latest is 17 weeks, 6th day	44	12.7
Earliest 6 weeks, latest 14 weeks, 6th day (Correct answer)	118	34.1
Earliest 8 weeks, latest 12 weeks	125	36.1
Earliest 10 weeks 6 days latest 15 weeks 6 days	27	7.8
Earliest 16 weeks, latest 32 weeks	32	9.2
Please tick the applications that you think are correct for the age ranges where the HPV vaccine is applied (n = 342) #		
HPV vaccine is recommended for girls at the age of 11-12 (before the first sexual intercourse, if possible).	271	79.2
13–26 years old catch-up vaccine is applied in girls.	156	45.6
HPV vaccine is recommended for men 11-12 years old (before first sexual intercourse if possible)	135	39.5
Catch-up vaccine for men is administered between the ages of 11-21.	78	22.8

	n	%
There is no upper limit for age for vaccination.	125	36.5
Frequency of recommending meningococcal vaccine to non-risk age group (n = 370) #		
6 weeks or more	65	17.6
0–2 years	90	24.3
0–5 years	70	18.9
11–18 years (Correct answer)	23	6.2
2–55 years	98	26.5
I do not recommend	95	25.7

n: Number of patients; %: Percent; #There is more than one answer per participant, and the percentage is calculated on the number of patients.

Table (3) shows the distribution of the answers given by the participants to the suggestions asked about the vaccines not included in the routine vaccination schedule. Of the family physicians, 69.7% thought that Rotavirus vaccine, 69.4% of them thought that Meningococcus vaccine, and 61.7% of them thought that HPV vaccine should be included in the national vaccination schedule.

Table (3): Distribution of the responses of the participants to the suggestions asked about vaccines not in the routine vaccine schedule

(n = 377)	n (%)		
	Agreed*	Not agreed*	No idea
Rotavirus vaccine comes in two varieties, RotaTeq and Rotarix	309 (82.0)	7 (1.9)	61 (16.2)
Rotavirus vaccines are administered orally	317 (84.1)	29 (7.7)	31 (8.2)
Rotavirus is the most important cause of severe gastroenteritis, which causes infant and child deaths	332 (88.1)	26 (6.9)	19 (5.0)
Recommended scheme Rotarix 2-4th month, RotaTeq 2-4-6. month	284 (75.3)	24 (6.4)	69 (18.3)
Rotavirus can be prevented with water hygiene and sanitation	199 (52.8)	146 (38.7)	32 (8.5)
The last dose of both vaccines for rotavirus	107 (28.4)	121 (32.1)	149

(n = 377)	n (%)		
	Agreed*	Not agreed*	No idea
can be administered at the latest in the 34th week and 6 days.			(39.5)
There are two types of meningococcal vaccines, conjugated and polysaccharide	275 (72.9)	37 (9.8)	65 (17.2)
There are A, C, W, Y serotypes in the meningococcal vaccines used	187 (49.6)	35 (9.3)	155 (41.1)
Current meningococcal vaccines provide lifetime protection.	109 (28.9)	150 (39.8)	118 (31.3)
Meningococcal W-type is associated with pilgrimage and Umrah	195 (51.7)	17 (4.5)	165 (43.8)
The most common meningococcal serotypes in our country are W and B serotypes	171 (45.4)	29 (7.7)	177 (46.9)
MENVEO, MENECTRA, NIMENRIX vaccines containing A, C, W, Y serotypes are currently in use in our country.	195 (51.7)	23 (6.1)	159 (42.2)
BEXSERO containing meningococcal B serotype is still not in use in our country.	63 (16.7)	126 (33.4)	188 (49.9)
HPV 16 and 18 are not associated with cancer	35 (9.3)	291 (77.2)	51 (13.5)
There are bivalent (CERVARIX) and quadrivalent (GARDASIL) vaccines against HPV virus.	233 (61.8)	11 (2.9)	133 (35.3)
Gardasil at 0-2-6 months CERVARIX is administered at 0-1-6 months	133 (35.3)	27 (7.2)	217 (57.6)
HPV quadrivalent vaccine targets HPV 6, 11, 16, 18, HPV bivalent vaccine targets HPV 16 AND 18	230 (61.0)	16 (4.2)	131 (34.7)
Regular cervical scans are not necessary for vaccinated women	25 (6.6)	304 (80.6)	48 (12.7)
Breastfeeding is not contraindicated by HPV vaccination.	204 (54.1)	35 (9.3)	138 (36.6)

n: Number of patients; %: Percent *: Correct answers are in italics.

The comparison of the individual and total scores of the participants from the information questions is given in **Table (4)** and **Table (5)**. It was observed that the

HPV knowledge score was significantly lower in those aged 50 and over, those who did not recommend any vaccination, and those who did not have any vaccinations (**Table 4**). The same results were found in terms of total points (**Table 5**).

Table (4): Comparison of participants' Rotavirus HPV and Meningococcal information questions according to correct knowledge

	Rotavirus Knowledge score	HPV Knowledge score	Meningococcus Knowledge score
	Mean ± SD	Mean ± SD	Mean ± SD
Age			
25–29	0.37 ± 0.49 (n = 91)	2.52 ± 1.33 (n = 90)	0.10 ± 0.30 (n = 92)
30–39	0.36 ± 0.48 (n = 119)	2.29 ± 1.34 (n = 119)	0.05 ± 0.22 (n = 121)
40–49	0.26 ± 0.44 (n = 102)	2.03 ± 1.27 (n = 99)	0.04 ± 0.21 (n = 112)
50 ve over	0.41 ± 0.50 (n = 34)	1.88 ± 1.20 (n = 34)	0.07 ± 0.25 (n = 45)
p[1]	0.258	0.024[c]	0.403
Recommending Vaccines Not in the Vaccination Schedule to Children, Adolescents and Adults			
Recommend at least one vaccine	0.35 ± 0.48 (n = 318)	2.28 ± 1.33 (n = 314)	0.07 ± 0.25 (n = 333)
Never recommend	0.21 ± 0.42 (n = 28)	1.71 ± 1.05 (n = 28)	0.00 ± 0.00 (n = 37)
p[2]	0.108	0.028	<0.001
Own vaccination status			
Vaccinated with at least one vaccine	0.37 ± 0.48 (n = 192)	2.38 ± 1.37 (n = 190)	0.07 ± 0.25 (n = 203)
Never vaccinated	0.31 ± 0.46 (n = 154)	2.05 ± 1.23 (n = 152)	0.05 ± 0.23 (n = 167)
p[2]	0.207	0.019	0.551

Table (5): Comparison of the scores obtained from correct answers to Likert information questions according to some properties

Likert Knowledge Questions Total Score Ort±SS		p
Age		
25–29 (n = 92)	11.53 ± 3.07	0.001*[c]
30–39 (n = 123)	11.84 ± 3.92	
40–49 (n = 114)	10.75 ± 4.20	
50 and over (n = 48)	9.31 ± 5.06	
Recommending Vaccines Not in the Vaccination Schedule to Children, Adolescents and Adults		
Recommend at least one vaccine (n = 338)	11.55 ± 3.83	0.001**
Never recommend (n = 39)	7.28 ± 3.97	
Own vaccination status		
Vaccinated with at least one vaccine	12.04 ± 3.98	0.001**
Never vaccinated	9.98 ± 3.85	

Discussion

Among the family doctors who took part in this study, one in ten did not suggest any of the particular immunizations. The fact that certain vaccines were paid for was a significant factor in our study, but the main reason why doctors did not suggest them was because they were not on the vaccination schedule. For the same reasons, doctors who did not recommend the vaccine and those who did not intend to do so did not vaccinate themselves. Even if this circumstance aligns with the literature [(14)], this problem can be solved by the Ministry by including these vaccines in the national vaccination schedule and by ensuring that the costs are covered by the state.

In the majority of studies, each vaccine was examined individually, and each participant's degree of knowledge was assessed separately. Accurate responses to items assessing HPV vaccine knowledge ranged from 17% to 91%, whereas accurate responses to items evaluating HPV knowledge varied from 22% to 95%, according to a systematic review that examined 60 researches. Clinical professionals know less about HPV in men than in women [(15)]. In a study conducted with gynecologists, pediatricians, family physicians and infection specialists in Lebanon, the HPV knowledge level was found to be 73% [(16)].

In a large-scale study conducted with healthcare professionals, HPV vaccine knowledge score was determined as 69.2% and attitude score was 5 on average [(17)]. In

a study conducted with gynecologists in Serbia, the knowledge of gynecologists was calculated as average. 98.3% of gynecologists thought that they needed additional training on this subject. In a study conducted with child health workers (doctors and nurses) in Sweden with an interval of 2 years, it was seen that the level of rotavirus knowledge was higher in the study performed 2 years later [18].

About the special vaccines that are not included in the routine vaccination schedule, 26% of the participants state that they have sufficient information, and 56.5% have partial knowledge. Despite this, the frequency of giving correct answers to the questions regarding the time of recommendation for vaccines remained low in general. It is thought that the reason for this may be the variability in the frequency of in-service training for physicians. The vast majority (88.7%) of those who do not have sufficient knowledge stated that they want to overcome these deficiencies with in-service training. Based on the present results, it can be said that the lack of knowledge about vaccines in our country is much higher than the studies in the literature. For this, it is necessary to support and update the training of family physicians, which are the first contact point in health, both in the assistantship process and in the process they work in the field.

The study's descriptive characteristics revealed that when the request for at least one vaccine to be added to the national vaccination schedule was compared, statistically significant results were obtained. Additionally, female physicians are more likely than male physicians to support the addition of specific vaccines to the National Vaccine Program. In a similar vein, this study's findings showed that female doctors gave more vaccine recommendations. Physicians between the ages of 30 and 39 were more inclined than those between the ages of 40 and 49 to include special vaccinations in the vaccination schedule.

In a similar vein, doctors with 10–19 years of service, based on their professional education period, were statistically significantly more likely to request the addition of at least one vaccine to the national vaccination program than doctors with 30 years or more of service. According to this perspective, those who have served for more than 30 years believe that the current vaccination schedule is adequate and that none of the additional vaccines are required. However, although many communities who have a say in this subject recommend adding the rotavirus vaccine to the calendar, it can be said that awareness should be raised with in-service training for physicians and these differences between groups should be evaluated.

In the present study, it was concluded that female physicians both have more sufficient information and vaccinated their children more than male physicians, and this is because women do more research for their children on this subject, and therefore have more information, and as a result of all these, they can protect their children more based on their knowledge. The total scores of knowledge questions of those who recommend at least one vaccine to their patients and those who have had at least one vaccine were significantly higher than those who did not recommend it at all and those who have never had it. From this point of view, it can be concluded that those who have correct knowledge about vaccines do not mind getting the vaccine themselves and therefore recommend it to their patients.

Prior to administration of rotavirus vaccines, more than 65% of children had at least

one rotavirus diarrhea by age 5, and >40% of all-cause diarrhea hospitalizations worldwide were rotavirus- related [19]. Vaccination of infants against rotavirus is recommended globally in line with the recommendations of the Center for Disease Control and Prevention, WHO, American Academy of Pediatrics, American Academy of Family Physicians, European Pediatric Infectious Diseases Society and European Pediatric Gastroenterology Hepatology and Nutrition Society [13].

In countries where the rotavirus vaccine was administered, a 40% decrease in hospitalization rates due to rotavirus among children under 5 years of age and a 25% decrease in annual rotavirus diarrhea deaths worldwide were observed. The efficacy of oral rotavirus vaccines and their success in reducing mortality and hospitalization have been proven by randomized controlled studies and meta-analyses [20, 21]. Although rotavirus vaccines are already in use in KSA, they have not been included in the national vaccination program yet. It is important that family physicians, who are involved in the administration and follow-up of the vaccines included in the national vaccination program, have information about the special vaccines that are not included in the calendar.

Of the 377 family physicians included in this study, 74.8% recommend rotavirus vaccination, 42.3% report that they have their own child vaccinated against rotavirus, and 84.5% of the participants who do not have children would vaccinate if they had children. 69.7% of the participants thought that the rotavirus vaccine should be included in the national vaccination schedule. In a study conducted by Sperou et al. (2017) [22] in 2017, 573 physicians supported future vaccines for pathogens that cause gastroenteritis, and in another study by O'Leary et al. (2013) [23], 65% of family physicians in the USA were pediatricians. It was reported that 95% of them routinely recommend rotavirus vaccine.

In a study conducted by Parlakay et al. (2020) [24], it was stated that 82.8% of the physicians working in the third-level pediatric hospital recommended the vaccine. In another study conducted with 300 family physicians and 230 pediatricians, it was determined that the rotavirus vaccine was the most recommended vaccine (60.5%) by the physicians and requested to be included in the vaccine schedule (48.5%). It was observed that pediatricians recommended rotavirus, meningococcal and Tdap vaccines more than family physicians [25].

Conclusion

As a result of our study, among the vaccines that are not included in the national vaccination schedule, the most recommended vaccine to their patients by the physicians participating in the study was determined as the rotavirus vaccine. Other recommended vaccines are, in order of frequency, meningococcal, influenza, HPV and adult pertussis vaccine. Approximately one-tenth of physicians did not recommend any of the vaccines that are not included in the national vaccination schedule to their patients. Among the reasons put forward by physicians who did not recommend vaccines, the most dominant one was that the vaccine is not included in the vaccine schedule of the Ministry of Health. The other most important reason was the cost of the vaccine. This is followed by hesitation due to possible side effects of the vaccine,

not having enough information about vaccines and not believing in the protection of the vaccine. In general, as the level of knowledge about special vaccines decreases, the frequency of self-vaccination, recommending it to patients and asking it to be included in the national vaccine schedule, also decreases. For this reason, increasing the knowledge of physicians about vaccines not included in the national vaccination schedule will contribute to the dissemination of vaccines, thus increasing immunity and reducing mortality and morbidity.

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