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New targets for Turkish childhood national immunization schedule

Türkiye'de çocukluk çağı ulusal aşı takviminde yeni hedefler

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Abstract

Aim: The National Immunization Schedule (NIS) of Childhood has high coverage, but the administration of non-NIS vaccines (rotavirus, human papilloma virus, meningococcal, influenza, adult type pertussis vaccines [Tdap]) is not widespread in Turkey, despite recommendations by immunization experts. This report intended to explore the administration rates of these vaccines and their reasons in this province.

Methods: This questionnaire based cross-sectional study was conducted in a small city in middle northern Turkey. The target population was the family physicians of this city. The participants filled a survey containing questions about their sociodemographic and professional features and attitudes about non-NIS vaccines via email or telephone interviews.

Results: Seventy-eight (72%) of 108 physicians were enrolled in the study. The most and least recommended vaccines in daily practice and for addition to NIS were rotavirus and Tdap vaccines, respectively. The main reason of not administrating non-NIS vaccines was lack of knowledge and experience.

Conclusion: Vaccination is the safest and cheapest way of protecting from infectious diseases. Family physicians are the leaders of these procedures in the field. Education should be provided to help them reach current knowledge regarding immunizations. Community pediatricians can provide expert consultation. These vaccines should be covered by social security.

Keywords: Immunization, Family physician, Attitude

Öz

Amaç: Türkiye'de Çocukluk Çağı Ulusal Bağışıklama Programının kapsayıcılığı yüksektir; bu programda yer almayan rotavirüs, human papilloma virüs, meningokok, influenza ve erişkin tip boğmaca aşılarının uygulaması bağışıklama ile ilgili uzmanlar tarafından önerilmesine rağmen yaygın değildir. Bu çalışmada bu aşıların uygulanma oranının ve nedenlerinin belirlenmesi hedeflendi.

Yöntemler: Ankete dayalı kesitsel bir çalışma olarak planlanan bu çalışma Orta Kuzey Anadolu'da küçük bir il merkezinde aile hekimleri ile yürütüldü. Katılımcılar tarafından elektronik posta veya telefon görüşmeleri ile sosyodemografik ve mesleki özelliklerini, Çocukluk Çağı Ulusal Aşı Programı dışındaki aşılar konusunda tutumlarının sorulduğu anket formları dolduruldu.

Bulgular: Çalışmaya 108 aile hekiminin 78'i (%72) katıldı. Rotavirus aşısı hem günlük çalışma hayatında, hem de Ulusal Aşı Takvimi'ne dahil edilme önerisi konusunda en yaygın aşı idi. Tdab her iki durumda da en az önerilen aşı idi. Takvimde olmayan aşıların uygulanmaması konusunda en sık neden olarak hekimlerin konuyla ilgili bilgi ve deneyimlerinin yetersiz olması saptandı.

Sonuç: Aşılar enfeksiyon hastalıklarından korunmanın en güvenilir ve ucuz yoludur, bu hizmetlerin sahada yürütülmesini sağlayan kaptanlar aile hekimleridir. Onların bağışıklama ile ilgili güncel bilgi ve gelişmelere ulaşmasını sağlamak için eğitim programları düzenlenmelidir. Çocuk sağlığı izlemelerinde Sosyal Pediatri hekimleri bağışıklama konusunda danışmanlık verebilir. Ek olarak, bu aşılar sosyal güvenlik sisteminin geri ödeme kapsamına alınmalıdır.

Anahtar kelimeler: Bağışıklama, Aile hekimi, Tutum

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Etik Kurul Onayı: Amasya Üniversitesi, Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu (karar no: 15386878-044; toplantı tarihi: 5 Aralık 2019) çalışmayı onayladı. İnsan katılımcıların katıldığı çalışmalardaki tüm prosedürler, 1964 Helsinki Deklarasyonu ve daha sonra yapılan değişiklikler uyarınca gerçekleştirilmiştir.

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Introduction

The morbidity and mortality of infectious diseases can be reduced with high immunity rates. Vaccines provide simple, reliable, cheap, and effective ways for improvement of public health, and they are the most available means of protection from infectious diseases [1]. In Turkey, the National Immunization Schedule (NIS) is implemented meticulously under the control of Health Ministry of Turkish Republic (HMTR). The NIS includes vaccines against thirteen diseases [2]. All vaccines are supplied and administered freely at primary health care centers by family physicians. Although rotavirus (RVV), human papilloma virus (HPVV), adult type pertussis (Tdap), influenza and conjugated meningococcal vaccines are licensed and available for procurement, they are not included in NIS and defined as "non-NIS vaccines." Their administration is voluntary, and costs are covered by families themselves. The application depends on the recommendation of physicians or the requisition of the families. Although these immunizations are strongly advocated, lack of knowledge about the diseases or immunization facilities, safety concerns, personal beliefs, other priorities, and financial problems are the impediments of non-NIS vaccines [3]. The rate of recommendation and application of non-NIS vaccines are lower than expected, even in developed countries and Turkey [4,5].

Rotavirus infection is a common agent of pediatric acute gastroenteritis, with a prevalence of 22.5% in Turkey [6]. The prevalence is similar in developed and undeveloped countries, which reveals that improved sanitary conditions are insufficient in preventing the infection. It is more frequent in children under five years of age and causes electrolyte imbalance with dehydration [7]. More than 2.7 million episodes of diarrhea, 400,000 outpatient office visits, and 55,000–70,000 hospitalizations per year are attributed to rotavirus in the United States (US) [8]. Vaccination is cost-effective and reduces the disease burden [9,10]. Advisory Committee on Immunization Practices (ACIP) recommends the vaccine to all infants unless contraindicated [7].

Meningococcal disease is an acute, potentially severe, and mortal illness caused by *Neisseria meningitidis.* It is one of the leading causes of bacterial meningitis and sepsis with high morbidity and mortality. Immunodeficiencies related with complement pathway or asplenia are risk factors for invasive meningococcal disease (IMD) [7]. It was the most common agent of bacterial meningitis in Turkey with the serogroups of W-135 (38.1%), B (26.1%), A (8.4%), Y (0.9%) and non-groupable strains (26.4%) [11]. In addition, nasal carriage, which is the most important notion in the epidemiology of IMD rate, is also remarkable, and the serogroup distribution is similar to disease-causing agents [12]. Meningococcal seroepidemiology of Turkey is different from other countries as serogroups W and B are the predominant strains of IMD during childhood. Serogroup C has not been reported for years. The adolescent peak is not observed, and the infection is more common under five years of age [11,12]. Two types of vaccines containing serogroups MenACWY and serogroup MenB are recommended for Turkey. MenACWY is administered to candidate pilgrims before Hajj as one of the travel vaccines, which is one of the finest ways to prevent nasal carriage [12].

HPV infections are usually asymptomatic, but clinical manifestations include anogenital warts, recurrent respiratory papillomatosis, cervical intraepithelial neoplasia, genital and oropharyngeal cancers [7]. As it is one of the most common agents of sexually transmitted disease (STD), it is recommended before the onset of sexual activity. That is why adolescent coverage of the immunization is particularly important [7]. The prevalence of HPV and annual cervical cancer in women is 4.2-25% and 1.43/100000, respectively [13]. HPV is known as one of the preventable reasons of cancer.

Pertussis is one of the frequent reasons of lower respiratory tract infections in infants (LRTI). It causes severe respiratory distress with paroxysms of rapid coughs in infants and prolonged coughing attacks in adolescents. Neither having the infection nor vaccination provides lifelong immunity, but the severity of symptoms decreases with increasing age. People with mild symptoms may transmit the infection to susceptible individuals, such as unimmunized or incompletely vaccinated infants. Acellular pertussis vaccine cannot be administered before six weeks of age and at least three doses are necessary for protection [7]. Tdap is usually recommended to adolescents, pregnant women and adults who are in contact with infants to form a "cocoon" around them. The last dose of tetanus vaccination (Td) during pregnancy or adolescent dose of Td can be administered as Tdap [14,15].

Seasonal influenza is a preventable, highly contagious infection and it can result in fatal complications in risky populations. It is a public health problem because the infection increases heath care costs while causing loss of labor and school time [16]. The infection can be complicated with LRTI in infants or children with chronic illnesses such as asthma, congenital heart diseases, immune deficiency, diabetes, etc. Influenza vaccination is recommended to all children aged between 6-59 months and every individual with a chronic health problem [7]. It should be considered as one of the components of cocooning strategy with Tdap [7,17]. Protection from these high-burden infections via non-NIS vaccines is possible because vaccines are available and strongly recommended. However, in Turkey, their coverage and recommendation are low. Primary healthcare workers are the main leaders of immunization services in the field and their attitude about the new applications in public health is important. The aim of this study is to determine the recommendation rate of non-NIS vaccines and the attitude of family physicians about these administrations in our province.

Materials and methods

This study was designed as a cross-sectional study based on a survey. It was conducted with the family physicians working at the primary health care centers of Amasya, a small city in middle northern Turkey, between December 15, 2019 and May 15, 2020. The data source of the study was a non-standardized questionnaire prepared by the researcher by summarizing the literature, comprising six sections with 35 questions (Appendix 1). The questions were about sociodemographic and professional features of the attendees, their knowledge and attitude about RVV, HPVV, Tdap,

influenza and meningococcal vaccines, experience about the related diseases and their personal intentions about the inclusion of each vaccine to NIS. Complicated diseases were defined as "cases requiring treatment by hospitalization due to clinical condition or laboratory abnormalities such as electrolyte imbalance." The researcher reached each physician by phone and asked whether they wanted to take part in the study. The questionnaires were filled via email or on-call interviews with the physicians who accepted to enroll. Informed consent was obtained before answering the questions.

Ethics

This study was approved by the Ethics Committee of Non-Invasive Clinical Research of the Amasya University with a decision number: 15386878-044 in December.

Statistical analysis

The analyses were performed with a statistical package program (SPSS v15.0 [SPSS Inc., Chicago, IL, USA]). Descriptive statistics were presented as frequency, percentages, arithmetical mean (standard deviation) (arithmetical mean [SD]), and median (minimum, maximum). Nominal variables were compared with Pearson's chi-square, Yate's corrected chi-square, and Fisher's exact test as appropriate. The distribution patterns of the variables were investigated by visual/analytical methods (Kolmogorov-Smirnov test/histograms). A p-value of less than 0.05 was considered statistically significant. The answers such as "I do not know" or "I do not have an idea" were accepted as not answered.

Results

In Amasya, the total number of family physicians is 108, and all were asked to enroll in the study. The researcher could not communicate with two physicians, ten physicians could not participate because of health problems and eighteen physicians were unwilling. Seventy-eight of 108 family physicians enrolled in the study, the participation rate was 72%. None of the physicians who filled the questionnaires was excluded from the study. The median age of the participants was 44 years (min-max: 27-65 years) and the median of active professional time was 20 years (min-max: 3-37 years). Fifty-three (67.9%) of the participants were males and 52.6% (n=41) were working in urban areas.

Seventeen (21.8%) participants declared that their knowledge about non-NIS vaccines was sufficient and 18 (23.1%) had received courses on the subject. RVV was the most prescribed vaccine (n=35; 45.5%) and the main source of recommendation was family will. Tdap was the least prescribed vaccine due to lack of knowledge and experience (n=43; 55.9%).

All participants (n=78) completed the RVV part of the survey. The estimated average rate of complicated acute gastroenteritis was 20%, half of which was attributed to RV infection. The average number of prescriptions per year was 4, and 38 (48.7%) of the participants had not prescribed RVV in the previous year. The most frequent reason of not prescribing RVV was lack of knowledge and experience about the vaccine (n=18; 38.3%). Fifty-two (66.7%) of the participants declared that they recommended the vaccine to their own siblings and relatives, 43 (55.1%) believed that RVV should be included in NIS.

The participation rate in questions about meningococcal vaccines was 100% (n=78). Twenty-three (29.5%) participants observed meningococcal disease during their education or professional time. Sixty-three (80.8%) participants had not prescribed meningococcal vaccines in the previous year. The main reason of not prescribing was lack of knowledge and experience about the vaccine (n=41; 52.5%). Fifty-five (70.5%) participants declared that they recommended the vaccine to their own siblings and 59% (n=46) thought that meningococcal vaccines should be included in NIS.

Seventy of the seventy-eight physicians answered the question about HPV infections. Thirty-two (41%) had HPV infected patients and 19 (24.4%) had patients with HPV-related malignancies. All participants answered the questions about the vaccine. The maximum number of vaccine prescriptions per year was five, and 66 (84.6%) participants had not prescribed the vaccine in the previous year. The main reason of not prescribing was lack of knowledge and experience about the vaccine (n=43; 55.1%). Forty-nine (62.8%) participants declared that they recommended the vaccine to their own siblings and relatives. Forty-one (52.6%) thought that HPV should be included in NIS.

All participants answered the Tdap section of the questionnaire. The estimated average acute LRTI and hospitalization rates were 10% and 5%, respectively. None of the participants had prescribed Tdap in the previous year due to lack of knowledge and experience about the vaccine (n=43; 55.1%). Thirty-two (41%) participants declared that they recommended the vaccine to their own siblings and relatives and 32 (41%) considered that Tdap vaccine should be included in NIS. The target population was declared as pregnant women by 6.4% (n=5), adolescents by 3.8% (n=3), and both by 31.1% (n=24).

The participation rate to the influenza section was 100%. The estimated average acute upper respiratory tract infection (URTI) and hospitalization rates were 26.5% and 10%, respectively. The average number of prescriptions per year was five and 24 (30.7%) participants had prescribed the influenza vaccine in the previous year. However, 48 (61.5%) physicians did not prescribe the vaccine, and 32% (n=25) of the non-prescribers declared that they thought pediatricians should recommend the vaccine. Forty-five (57.7%) participants declared that they recommended the vaccine to their own siblings and relatives and 25 (32.1%) believed that influenza vaccines should be included in NIS.

The gender, working place, age, and duration in the profession had no significant effect on recommending non-NIS vaccines and their addition to NIS (Table 1 and Table 2). At the end of the questionnaire, the participants were asked which vaccine they would recommend for addition to NIS if they were a member of the advisory committee of immunization of HMTR. RVV was the most popular answer to this question (n=20; 25.6%) and the reason was that the infection is common and complicated both for children and their parents.

Table 1: The sociodemographic, professional features of the family physicians and their recommendation rate of non-NIS vaccines to patients

	Rotavirus Vaccine Recommend/ Do not recommend		HPV Vaccine Recommend/ Do not recommend		Meningococcus vaccine Recommend/ Do not recommend		Influenza vaccine Recommend/ Do not recommend		Tdap vaccine Recommend/ Do not recommend	
Gender	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
	19 (35.8%)/ 34 (64.2%)	12 (48%)/ 13 (52%)	4 (7.5%)/ 49 (92.5%)	5 (20%)/ 20 (80%)	8 (15.1%)/ 45 (84.9%)	6 (24%)/ 19 (76%)	16 (30.2%)/ 37 (69.8%)	8 (32%)/ 17 (68%)	0	0
P-value	0.43		0.22		0.52		0.87			
Working place	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
	19 (46.3%)/ 22 (53.7%)	12 (32.4%)/ 25 (67.6%)	5 (12.2%)/ 36 (87.8%)	4 (10.8%)/ 33 (89.2%	9 (22%)/ 32 (78%)	5 (13.5%)/ 32 (86.5%)	15 (36.6%)/ 26 (63.4%)	9 (24.3%)/ 28 (75.7%)	0	0
P-value	0.31		0.85		0.50		0.35			
Age	≤40 years old	>40 years old	≤40 years old	>40 years old	≤40 years old	>40 years old	≤40 years old	>40 years old	≤40 years old	>40 years old
	16 (39%)/ 25 (61%)	15 (40.5%)/ 22 (59.5%)	3 (7.3%)/ 38 (92.7%)	6(16.2%)/ 31 (83.8%)	5 (12.2%)/ 36 (87.8%)	9 (24.3%)/ 28 (75.7%)	12 (29.3%)/ 29 (70.7%)	12 (32%)/ 25 (67.6%)	0	0
P-value	0.90		0.22		0.27		0.76			
Professional time	≤20 years	>20 years	≤20 years	>20 years	≤20 years	>20 years	≤20 years	>20 years	≤20 years	>20 years
	17 (35.4%)/ 31 (64.6%)	14 (46.7)/ 16 (53.3%)	4 (8.3%)/ 44 (91.7%)	5 (16.7%)/ 25 (83.3%)	7 (14.6%)/ 41 (85.4%)	7 (17.9%)/ 23 (76.7%)	14 (29.2%)/ 34 (70.8%)	10 (33.3%)/ 20 (66.7%)	0	0
P-value	0.45		0.45		0.50		0.90			

Table 2: The sociodemographic, professional features of the family physicians and their attitude about addition of non-NIS vaccines to NIS

	Rotavirus Vaccine to NIS Yes/No		HPV Vaccine to NIS Yes/No		Meningococcus vaccine to NIS Yes/No		Influenza vaccine to NIS Yes/No		Tdap to vaccine NIS Yes/No	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
	26 (49.1%) 12 (22.6%)	17 (68%)/ 4 (16%)	25 (47.2%)/ 14 (26.4%)	16 (64%)/ 5 (20%)	29 (54.7%)/ 7 (13.2%)	17 (68%)/ 3 (12%)	13 (24.5%)/ 22 (41.5)	11 (44%)/ 7 (28%)	21 (39.6%)/ 20 (37.7%)	11 (44%)/ 9 (36%)
P-value	0.28		0.37		0.31		0.13		0.53	
Working place	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
	21 (51.2%)/ 8 (19.5%)	22 (59.5%)/ 8 (21.6%)	17 (41.5%)/ 12 (29.3%)	24 (64.9%)/ 7 (18.9%)	23 (56.1%)/ 5 (12.2%)	23 (62.2%)/ 5 (13.5%)	12 (29.3%)/ 12 (29.3%)	12 (32.4%)/ 17 (45.9%)	16 (39%)/ 15 (36.6%)	16 (43.2%)/ 14 (37.8%)
P-value	0.35		0.20		0.63		0.26		0.81	
Age	≤40 years old	>40 years old	≤40 years old	>40 years old	≤40 years old	>40 years old	≤40 years old	>40 years old	≤40 years old	>40 years old
	26 (63.4%)/ 9 (22%)	17 (45.9%)/ 7 (18.9%)	27 (65.9%)/ 8 (19.5%)	14 (37.8%)/ 11 (29.7)	29 (70.7%)/ 5 (12.2%)	17 (45.9%)/ 5 (13.5%)	12 (29.3%)/ 19 (46.3%)	12 (32.4%)/ 10 (27%)	17 (41.5%)/ 16 (39%)	15 (40.5%)/% 13 (35.1%)
P-value	0.11		0.08		0.09		0.20		0.73	
Professional time	≤20 years	>20 years	≤20 years	>20 years	≤20 years	>20 years	≤20 years	>20 years	≤20 years	>20 years
	28 (58.3%)/ 12(25%)	15 (50%)/ 4 (13.3)	30 (62.5%)/ 10 (20.8%)	11 (36.7%)/ 9 (30.0%)	32 (66.7%)/ 6 (12.5%)	14 (46.7%)/ 4 (13.3%)	14 (29.2%)/ 20 (41.7%)	10 (33.3%)/ 9 (30%)	20 (41.7%)/ 18 (37.5%)	12 (40%)/ 11 (36.7%)
P-value	0.10		0.15		0.26		0.40		0.46	

Discussion

The coverage of non-NIS immunizations is low in the world and in our city. Although most of the participants recommended these vaccines to their relatives and approved their inclusion in NIS, the recommendation rate was exceptionally low. This study established that most of the family physicians in our province lacked knowledge about non-NIS vaccinations. The financial burden and need of expert consultation were the other reported significant problems in this study. Rotavirus was the most recommended vaccine, like the other studies conducted in Turkey [5]. RV causes a highly contagious infection, and the dissemination chain cannot be broken easily because the virus is resistant to sanitary precautions. Therefore, vaccination is the most effective way of protection. However, concerns about the safety, cost, efficiency, and efficacy of the vaccine reduce recommendation and administration rates. Many healthcare workers think that acute gastroenteritis can cause serious problems unless well treated, but vaccination is not considered a priority [18]. The vaccines are safe and efficient in reducing the severity of the symptoms and the cost-effectiveness of the vaccine was established by several studies [7,9]. However, the rates of recommendation and administration were much lower than desired in this study.

Meningococcal vaccines were the second highest recommended and offered vaccine for NIS in this study group. While most physicians had no clinical experience, the high morbidity and mortality rates intimidate the physicians. In Turkey, nasal carriage is high and Hajj season is important. The vaccine is recommended in immune deficiency, but passive smoking, crowded family life, and upper respiratory tract infections can facilitate the infection, which make it a significant public health problem [7]. In another study, the physicians stated that the reason of hesitation was that the serotypes of the agent in Turkey were not fully compatible with the vaccine content. Children must be vaccinated with both Men ACWY and Men B for protection. Two different vaccines for one disease increase the cost and injections [5]. However, insufficient knowledge and expert consultation requirement were the most common reasons of not recommending this vaccine in this study group.

HPV vaccine was not recommended frequently, but the physicians declared that it should be added to NIS because the infection rate is high, and the potential of malign transformation cannot be neglected. The most common reason for not offering was lack of knowledge and experience about the vaccine. In the literature, the barriers against HPV vaccination are cost of the vaccine, concerns about adverse effects and parental concerns of the vaccine rendering sexual activity easier and influencing it to happen at an earlier age. In developing countries, adolescent marriages must be considered as early sexual activity [7]. The rate of recommendation was 45.6% in Turkey, and the reasons for not recommending were the cost and not considering HPV a priority [5]. In Japan, the coverage of HPV vaccine (HPVV) was around 70.6% when it was first introduced to NIS but dropped to 0.6% because of adverse events following immunization [19]. In

another study from Japan, the recommendation rate of HPVV was 21%, although 53% of participants declared the necessity of immunization [20]. The effectiveness of the vaccine is high, so opportunities to prevent cancer should be seized [7]. Women's and children's health are the indispensable parts of public health.

Tdap is a new vaccine in the Turkish market. In many studies, it is the least recommended vaccine because the knowledge and experience about it is limited [5,21]. Although Tdap is recommended as the last dose of Td in childhood-adolescent and pregnancy immunization schedules in developed countries [22], pertussis was not considered a primary healthcare problem [5]. As mentioned before, it is a part of cocooning strategy for the sake of infants who are at risk of severe, complicated LRTI [17].

Seasonal influenza vaccination is recommended to every individual who is at risk of complicated infection, including chronically ill people, pregnant women, children under five years of age, people who have to work in crowded places and may have role in the transmission of the infection in the society such as health care workers, nursery staff, etc. [7]. The coverage of influenza vaccination is lower than expected in adolescents as it is available as "voluntary vaccine" in Japan and supplied by the families with charge [20]. Adolescent vaccination is a part of cocooning strategy of infants for influenza and pertussis unless there is a risk factor for the receiver [7]. In the USA, it is recommended to all children [22]. In Turkey, influenza is under the cover of social security insurance in chronically ill people and the recommendation of the vaccine is usually limited with this population [21]. It is recommended to healthcare workers, too; the acceptance rate was under 50% even in the pandemic season due to disbelief in the necessity of vaccination, concerns about adverse effects, inability to get vaccinated, debates about the vaccine [23]. In this study, family physicians declared that they needed expert consultation for influenza immunization.

In the literature, there are some studies revealing that gender, working place or age and active professional time significantly affect the recommendation of some vaccines. For example, HPVV and Tdap were recommended by female physicians more frequently than male physicians. HPPV is one of the main reasons of gynecologic cancers and Td is in the routine schedule of pregnancy immunizations, which may have increased the awareness of female physicians on the subject. In addition, younger physicians who are new in their professions tend to recommend new vaccines which may be related with possessing current information about immunization [5,24]. However, in this study, none of these variables had statistically significant effects on recommending non-NIS vaccines.

The attitude of physicians about recommending the non-NIS vaccines to their relatives establish their opinion about the vaccine and their attitude about the addition of vaccines to NIS [25]. In this study, approximately 60% of the physicians recommended RVV, HPVV, meningococcus and influenza vaccines to their relatives and their attitudes about addition of these vaccines to NIS were similar. However, Tdap was the least recommended vaccine to their relatives and NIS, which may be related with lack of knowledge and experience about Tdap since it is relatively new for Turkey.

Limitations

This study established the attitude of family physicians, the leaders of immunizations services in the field, about non-NIS vaccines. However, the study setting was a small city and participation was limited. The data were obtained by a non-standardized survey based on personal declaration during that limited time. The limited number of participants and the survey, although it was prepared after reviewing the literature, were the sources of bias in this study. Also, pediatricians were not included. These limitations make it difficult to generalize the results. New multi-center studies with broad participation and standardized investigation tools should be planned.

Conclusion

Family physicians should be educated, and immunizations should be administered under the coverage of social security insurance to increase the recommendation of non-NIS vaccines. Current affairs should be shared at the formal websites of the HMTR and stakeholders. Community Pediatrics should be approved as a subspecialty of Pediatrics in Turkey and immunization consultation should be managed with family physicians at the primary health care centers during pediatric control visits. The patients should not visit hospitals, which carry disease burdens, for these procedures. In addition, families should be aware of the immunization opportunities of their children to benefit from these services. Family physicians have important roles in detecting the priorities of public health and their attitude about new vaccines is important. The authorities believe that adding a new vaccine to NIS is a right and chance for every child to become a healthy individual, and it is everyone's duty to build up herd immunity.

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