



Factors Affecting the Immunization Approaches of Caregivers: An Example of a Teaching and Research Hospital

Ebeveynlerin Aşı Yaklaşımlarını Etkileyen Faktörler:
Bir Eğitim Araştırma Hastanesine İlişkin Değerlendirme

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Abstract

Objective: Immunization programs prevent diseases that could result in fatal or permanent disabilities in the field of health. Although technical facilities and healthcare personnel are the most important criteria in vaccination programs, the adaptation of caregivers to vaccination programs has increasingly become an important issue. In our study, it was aimed to determine the factors affecting the vaccination approaches of the caregivers and the level of knowledge regarding vaccine names.

Material and Methods: In this cross-sectional descriptive study, parents who applied to the pediatric outpatient clinic of our hospital for any reason during a six-month period were evaluated for their knowledge on and attitudes towards vaccines. In the questionnaire, demographic characteristics of families, income and education levels, number of children and presence of vaccination record cards of the children were sought with the face-to-face interview technique. In the survey, the names of routine vaccines made by the Ministry of Health of the Republic of Turkey and vaccines recommended in childhood were presented mixed, and they were asked to indicate the vaccines they knew.

Results: In the study, 302 questionnaires were included. Of the parents who participated, 268 were mothers. Majority of the cases (254, 84.1%) were found to have a vaccination record card. Having an only child was found to have a positive impact on the presence of a vaccination record card, regular immunization, knowledge on vaccines and immunization with the vaccines recommended in childhood. 84.1% (254) of the parents found vaccination necessary. Parents were most aware of measles

Öz

Giriş: Çocuk aşılama programları sonucunda sağlık alanında ölümcül veya kalıcı sakatlıklar ile sonuçlanabilecek birçok hastalıklara karşı korunma sağlanmaktadır. Aşılama programlarında teknik altyapı ve personel en önemli kriter olsa da bakım verenlerin aşı programlarına uyumu önemi artan bir durum haline gelmiştir. Çalışmamızda ebeveynlerin aşı yaklaşımlarını etkileyen faktörleri belirlemek ve aşı isimlerini bilme düzeylerini saptamak amaçlanmıştır.

Gereç ve Yöntemler: Bu kesitsel-tanımlayıcı çalışmada hastanemiz çocuk sağlığı ve hastalıkları polikliniğine altı aylık dönemde herhangi bir nedenle başvuran ebeveynlerin aşılar hakkındaki bilgi ve tutumları değerlendirildi. Ankette ebeveynlerle yüz yüze görüşme tekniği ile ailelerin demografik özellikleri, gelir ve eğitim düzeyleri, çocuk sayıları, çocukların aşı kartı varlığı sorgulandı. Ankette T.C. Sağlık Bakanlığı tarafından yapılan ve çocukluk çağında önerilen rutin olmayan aşıların isimleri karışık olarak sunuldu, bildikleri aşıları belirtmeleri istendi.

Bulgular: Araştırmaya 302 anket dahil edildi. Katılımcı olan ebeveynlerin 268'i anneydi. Olguların çoğunluğunun (254; %84.1) aşı kartı olduğu görüldü. Tek çocuk olmanın aşı kartı varlığını, aşıların düzenli yapılmasını, rutin olmayan aşığı bilme ve yaptırmayı olumlu yönde etkilediği görüldü. Ebeveynlerin %84.1 (n= 254)'inin aşılamayı gerekli bulduğu saptandı. Ebeveynlerin en çok kızamık aşısından haberdar olduğu, hiçbir aşı ismini bilmeyen 91 (%30.1) ebeveyn olduğu görüldü. Ebeveynlerin %35.8'inin rutin

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vaccination, and there were 91 (30.1%) parents who did not know any vaccination names. It was found that 35.8% of the parents heard of special vaccines not routinely performed, but only 15.6% of them were found to have been vaccinated with these vaccines not routinely performed. It was observed that as the level of education of the mother increased, the rate of being aware of vaccines and getting them increased.

Conclusion: In our study, it was concluded that having many children and the income and education level of the caregiver affect immunization. It was seen that caregivers prefer health centers for information on immunization and vaccines, and therefore it is important to give more information regarding immunization in health institutions. It is concluded that the adaptation of caregivers to extended immunization programs can be achieved by increasing their knowledge about vaccines and vaccine preventable diseases.

Keywords: Vaccine, child, caregivers, education

Introduction

Primary aim of healthcare services and personnel is to opportune people to lead healthy lives. Immunization is the most effective method providing protection from infectious diseases (1). Distinctive reduction in mortality and morbidity from many infections preventable with vaccines since the onset of childhood immunization programs started to be enforced as a state policy in the twentieth century (2,3).

Although technical facilities and healthcare personnel are the most important criteria in vaccination programs, the adaptation of caregivers to vaccination programs has increasingly become an important issue (2,4). In 2010, it was seen that 19.3 million children were not fully vaccinated worldwide, and the rate of un-vaccinated children in some countries even reached up to 28% (5). Low education and income levels, sex, misinformation and lack of it have negatively affected immunization in studies conducted on the rates of vaccination (5-8). Nonetheless, vaccine hesitancy and rejection rates among socio-economically wealthy families in developed countries have risen tremendously in recent years (9-11). The concept of vaccine hesitancy that started in the 1990s in the world has gained popularity in our country since the year 2010. According to the statement by the Ministry of Health in December 2017, the number of families hesitant to vaccination surpassed 10.000 (12).

It has been seen that parental fear and worries towards vaccines are caused to a great extent by sharing misinformation and the declarations of anti-vaccination communities on social media (13-15). Relieving the anxiety towards vaccination is a must for the prevention of preventable diseases. Therefore, factors affecting vaccine implementation should be reviewed, and evaluation of caregivers's knowledge on vaccines and guiding the caregivers in the right manner are necessary (15).

olmayan aşıları duyduğu, ancak %15.6'sının rutin olmayan aşı yaptırdığı tespit edildi. Anne eğitim düzeyi arttıkça aşılarından haberdar olma ve yaptıрма oranlarının arttığı görüldü.

Sonuç: Çalışmamızda ekonomik ve eğitim düzeylerinin, çok çocuk sahibi olmanın aşılamaya üzerindeki etkileri görülmüş, ebeveynlerin aşı bilgilerini sağlık merkezlerinden öğrenmeyi tercih ettikleri, bu sebeple sağlık kuruluşlarında bağışıklama hakkında daha geniş bilgi verilmesinin önemli olduğu sonucuna ulaşılmıştır. Ebeveynlerin genişletilmiş bağışıklama programlarına uyumunun, aşılar ve hastalıklar hakkında bilgilerinin artırılması ile sağlanabileceği sonucuna ulaşılmıştır.

Anahtar Kelimeler: Aşı, çocuk, ebeveyn, eğitim

In light of this information, the aim of this study is to determine the factors affecting vaccine approaches of the caregivers and detect their level of knowledge regarding vaccine names.

Materials and Methods

In this cross-sectional descriptive study, caregivers who applied to the pediatric outpatient clinic of our hospital for any reason during a six-month period were evaluated for their knowledge on and attitudes towards vaccines. The study was commenced following the approval of the local ethics committee (04.04.2018, decision No: 2018/3-14). Oral and written informed consent was taken from volunteering caregivers. The questionnaire was carried out by face-to-face interview technique. Demographics of the families, their education and income levels and numbers of children were recorded. The child's age brought to the clinic for examination was noted. The children were divided into two groups as those under and over the age of two since there is intense vaccination carried out in the first two years of life in the extended vaccination program of the Ministry of Health.

Presence of a vaccination record card, vaccination necessity and side effects of vaccinations were questioned. The caregivers were asked if they had knowledge on vaccines recommended in childhood but not covered by the Ministry of Health. The names of the vaccines routinely carried out by the Ministry of Health of the Republic of Turkey (hepatitis B, BCG, DaTB-İPA-Hib, KPA, MMR, OPA, hepatitis A, varicella) and the names of the ones recommended in childhood but not routinely performed (influenza, rotavirus, human papilloma virus, and etc) were given mixed and the caregivers were asked to mark the ones they know about.

Chi-square test, numbers and percentages were used in the analysis of categorical (qualitative) variables. Binary comparisons in numeric data were performed on Student's-t test and ternary comparisons were conducted with one-way ANO-

VA test. Analyses of the current data were carried out on IBM SPSS 24 program (Statistical Package for Social Sciences, Chicago, IL, USA). $p < 0.05$ was accepted as statistical significance in all tests.

Results

314 patients, who applied to the pediatric outpatient clinic of our hospital, agreed to fill out the questionnaire. However, 12 questionnaires were excluded from the study since there were voids and contradictions in the responses of the caregivers, and 302 questionnaires were included. 88.7% of the participant caregivers were mothers (n=268), 7.6% were fathers (n=23) and 3.2% (n=11) were other family members. 41.7% (n=126) of the children at time of application to the clinic was aged two and under, 58.3% (n=176) was aged two and over. Majority of the caregivers were in the age range of 30-39. The families were mainly seen to have low-income and low education levels (Table 1).

Most of the cases, and especially those under the age of 2, were found to have vaccination record cards (n=254, 84.1%). It was established that families with a single child statistically more regularly had the vaccinations done when compared to the families with three or more children. Presence of vaccination record card was found to be statistically higher in families with one child or two when compared to those with three or more children (Table 2). It was determined that 84.1% of the caregivers (n=254) found vaccination necessary, 5.6% (n=17) found it unnecessary and 10.3% (n=31) was indecisive. Despite these rates, only 1.4% (n=4) of the caregivers were seen to have not got their children vaccinated regularly with reasons other than diseases (Table 2). It was noticed that two of the parents that did not have their children vaccinated considered vaccination unnecessary and the other two were found indecisive. It was put forth that 81.5% of the caregivers learned about vaccines from healthcare centers, 9.9% from TV/radio/newspaper/internet, 4.4% from relatives/friends and another 4.4% did not find doing research on the subject relevant.

It was seen that half of the caregivers (n=162, 53.6%) believed that vaccines had side effects. As side effects, 62.9% (n=102) of the caregivers indicated fever, 10.5% (n=17) emphasized rash and allergy, 9.2% (n=15) stated diarrhea, nausea and vomiting, 4.3% (n=7) expressed paralysis and 1.2% (n=2) pointed out seizures.

When the caregivers's knowledge on the names of the vaccines were evaluated, it was seen that they were mostly informed (54.8%) about the measles vaccination. There were 91 patients (30.1%) that did not know any vaccine names. It was found that 29.1% (n=78) of the mothers and 43.4% (n=10) of the fathers did not know the names of the vaccines of the Ministry of Health. Since there were only 23 fathers participating

Table 1. Demographics of the caregivers

	n (%)
Mother's age	
< 20 years	7 (2.3)
20-29 years	103 (34.1)
30-39 years	130 (43.0)
> 40 years	62 (20.5)
Father's age	
< 20 years	2 (0.7)
20-29 years	59 (19.5)
30-39 years	136 (45.0)
> 40 years	104 (34.4)
Number of children	
1	121 (40.1)
2	87 (28.8)
≥ 3	94 (31.1)
Mother's occupation	
Housewife	236 (78.1)
Worker	31 (10.3)
Civil servant	14 (4.6)
Other	21 (7.0)
Father's occupation	
Unemployed	21 (7.0)
Worker	152 (50.3)
Civil servant	20 (6.6)
Other	108 (35.8)
Mother's education status	
None	25 (8.3)
Primary school 1 st stage	113 (37.4)
Primary school 2 nd stage	72 (23.9)
High school	68 (22.5)
University	24 (7.9)
Father's education status	
None	11 (3.6)
Primary school 1 st stage	109 (36.1)
Primary school 2 nd stage	74 (24.5)
High school	75 (24.7)
University	33 (10.9)
Family total income (YTL/month)	
0-1000	63 (20.9)
1001-2000	119 (39.4)
2001-3000	72 (23.8)
> 3001	48 (15.9)

Table 2. Presence of vaccination record card and regular vaccination

	n (%)		
Were the vaccines regularly applied?			
Yes	284 (94.0)		
No	18 (6.0)		
Was ill, postponed	12 (4.0)		
Do not find it necessary	2 (0.7)		
Find it harmful	2 (0.7)		
	Were the vaccines regularly applied? (%)		p
Patient age	Yes	No	0.310*
≤ 2 years	117 (91.4)	9 (8.6)	
> 2 years	167 (94.8)	9 (5.2)	
Number of children			
1	117 (96.6)	4 (3.4)	0.065**
2	83 (95.4)	4 (4.6)	
≥ 3	84 (89.3)	10 (10.7)	
	Presence of vaccination record card (%)		
Patient age	Yes	No	
≤ 2 years	116 (92.0)	10 (8.0)	0.001*
> 2 years	138 (78.4)	38 (21.6)	
Number of children			
1	108 (89.2)	13 (10.8)	0.008**
2	76 (87.3)	11 (12.7)	
≥ 3	70 (74.4)	24 (25.6)	

* Chi-square test.
** Anova test.

Table 3. Mother’s education status and knowledge on vaccine names

	Knowledge on vaccines covered by Ministry of Health (%)	
	Yes*	No
Mother’s education status		
None	10 (47.6)	11 (52.4)
Primary school 1 st stage	62 (63.9)	35 (36.1)
Primary school 2 nd stage	49 (73.1)	18 (26.9)
High school	48 (80.0)	12 (20.0)
University	21 (91.3)	2 (8.7)
	Knowledge on non-routine vaccines	
	Yes*	No
Mother’s education status		
None	3 (14.2)	18 (85.8)
Primary school 1 st stage	19 (19.6)	78 (80.4)
Primary school 2 nd stage	19 (28.3)	48 (71.7)
High school	23 (38.3)	37 (61.7)
University	19 (82.6)	4 (17.4)

* Yes: means the mother knows one or more vaccine names.

in the questionnaire that the effect of father’s education level was not evaluated. When that of the mothers was evaluated, 70.9% of the caregivers knew one or more names of the vaccines of the Ministry of Health, and as the level of education increased so did the level of knowledge on vaccines (Table 3).

It was determined that 35.8% of the caregivers heard about the vaccines not routinely performed but only 15.6% of them had these vaccines administered. It was seen that 70.5% (n= 213) of the caregivers did not know which non-routine vaccine is protective against which diseases. 69% (n= 185) of the mothers and 86.9% (n= 20) of the fathers were found to have no knowledge on non-routine vaccines. When mothers were evaluated, it was noticed that 31% (n= 83) was aware and informed of one or more non-routine vaccine and as the education level increased so did the level of being informed of non-routine vaccines (Table 3). Out of the non-routine vaccines, 19 children were vaccinated for rotavirus, four for meningococcus, and two for vacicella. As the income level of the family increased so did implementation of non-routine vaccines. With the increase in the number of children in the family, there found to be a reduction in the knowledge and implementation of non-routine vaccines (Table 4). Mothers were found to be more informed about rotavirus (16.4%) and fathers about influenza (13%) vaccines among all non-routine vaccines.

Discussion

Our study data revealed that low income and education level and having many children negatively affects vaccine awareness. Moreover, it was established that even though there is a group of caregivers with negative opinion on vacci-

Table 4. Evaluation of the caregivers approach to non-routine vaccinations and knowledge of their names

	Knowledge on non-routine vaccines (%)		p
	Yes	No	
Family total income (YTL/month)			
0-1000	12 (19.0)	51 (81.0)	
1001-2000	38 (31.9)	81 (68.1)	
2001-3000	35 (48.6)	37 (51.4)	
> 3001	23 (47.9)	25 (52.1)	
Number of children			< 0.05*
1	57 (47.1)	64 (52.9)	
2	32 (36.7)	55 (63.3)	
≥ 3	19 (20.2)	84 (79.8)	
	Non-routine vaccination practice (%)		
	Yes	No	
Family total income (YTL/month)			
0-1000	3 (4.8)	60 (95.2)	
1001-2000	17 (14.2)	102 (85.8)	
2001-3000	18 (25.0)	54 (75.0)	
> 3001	9 (18.8)	39 (81.2)	
Number of children			0.041*
1	25 (20.6)	96 (79.4)	
2	12 (13.8)	75 (86.2)	
≥ 3	10 (10.6)	(89.4)	

* Anova.

nation, these caregivers complied with the National Immunization Program of the Ministry of Health.

Majority of the mothers applying to outpatient clinics in our study comprised of housewives. In field studies conducted in our country, the female population has been found to be not satisfactorily involved in business life and has been determined as being housewives at a rate of 92% (4,16). Although outpatient clinic applications of the children were mostly made by mothers, the fact that one fourth of the mothers were employed and 24 caregivers were fathers made us consider that fathers also needed to be informed about vaccines. Although it has been observed that majority of the families has two children in field studies carried out in various cities of our country, one third of the applications to our hospital consisted families with three or more children. Education level of the mothers were mostly detected at the first stage and at similar rates with field studies (2,4).

Regular practice of vaccines in our study was found to be high (76.4%) as regards Turkish Population and Health Research (TPHR, 2013) data. Similar to TPHR data, percentage of regular vaccination under the age of two was detected to be higher. Even though the increase in the number of children cause setbacks in vaccination, vaccination percentage was

found higher in all groups with regard to TPHR-2013 data (16).

It has been emphasized in field studies carried out in Turkey that the most important source of knowledge on immunization in the healthcare workers (4,15,17). International studies have insisted on the fact that caregivers search about vaccines on the internet and the negative data on these resources has led to an increase in vaccine hesitancy and rejection (3). Moreover, it is seen that caregivers rely on information found in physician group websites the most (9,18). Again participants having a relative or a friend who lives abroad and has gone through a negative experience on vaccines stated vaccine hesitancy or higher rates of rejecting doctor's recommendations (19,20). In a field study taken place in 2016 regarding vaccine necessity, 98.1% of the caregivers agreed but the number of caregivers unwilling to have their children vaccinated increased from 183 in 2011 to 980 in 2013, 5400 in 2015 and 12.000 in 2016, and case number regarding vaccine hesitancy has increased up to 23.000 by the year 2018 (4,21). It was seen in our study that caregivers continued to get their children vaccinated despite negative opinions on the matter. These results made us consider that their answers regarding vaccine necessity were contradictory and this condition was due to not being sufficiently informed on the matter. Fever was the answer given by most caregivers regarding the question on side effects. Side effects like infertility, autism and reduction in immunity stated in field studies were not put forward (15,17,22), which made us believe that caregivers reached sufficient and accurate information on vaccines in healthcare institutions where they most frequently received information regarding vaccines and immunization.

When factors affecting vaccination status in the studies conducted, Uzuner et al. have found that mother's education and income level, social security and having tetanus vaccination in this process are effective; Aktürk et al. have concluded that mother's education level and monthly income, Ayçiçek et al. have established that mother's education level, place of settlement (countryside or city), socioeconomic environment and family's economic status are effective. On the other hand, Altun et al. have stated that education and income levels of the caregivers do not have any impact on vaccination (2,4,23-25). Furthermore, field studies put forth that the rate of the number of children in the family and what number the children brought to the outpatient clinic is affecting getting vaccinated and knowledge level of vaccines (15,26,27). In a study conducted in the province Diyarbakır, the increase in the birth rank of the child decreases vaccination rate and having many children negatively affects vaccination (28). A study carried out in the UK has similarly detected that the increase in sibling numbers is related to the delay in vaccination (26). However, a study centered in Kayseri has demonstrated that full vacci-

nation rates of three or more siblings are higher than those of two or less siblings (29). In our study, as the level of income and education level of the caregivers increased so did the knowledge on routine and non-routine vaccine names. Moreover, the increase in the number of siblings led to a decrease in the presence of a vaccination record card, regular practice of vaccinations and knowledge on the names of non-routine vaccines and having them.

In field studies questioning the caregivers's level of knowledge regarding non-routine vaccines on Turkey, it has been found that two thirds of the caregivers do not know any non-routine vaccines and the ones who do could count influenza, measles and meningitis vaccines at the first place (2,4). Particularly bringing forward chronic patients or elderly patients who are not vaccinated due to influenza in the media causes the perception that this vaccine is not necessary in the pediatric age group. Therefore, the importance of pediatric influenza vaccination should be better conveyed and positive attitudes of the public and healthcare workers should be supported (30). It was seen in our study that caregivers knew about measles vaccination among the vaccines implemented by the Ministry of Health the most. The changes in the measles vaccination policy that have occurred in the last five years have increased sensitivity of the caregivers.

Since only caregivers applying to the outpatient clinic of our hospital during a selected period of time and accepting to participate in the study were included into our study, the results reflect a cross-sectional period and our number is limited. Due to its location, caregivers applying to our hospital come from low income and low educational backgrounds, and thus, healthier results will be reached if these factors are put forth in a more heterogenous study population. When vaccine hesitancy is considered to be higher in certain regions where the education levels of caregivers is high, low vaccine hesitancy detected in our study might be related to this fact (9).

The effects of low income and education levels and having many children on vaccination were seen in our study and we drew the conclusion that caregivers did not possess sufficient knowledge on the matter. It was seen that caregivers preferred healthcare centers to get the information they need on vaccines, and it was concluded that providing caregivers with extensive knowledge on immunization in healthcare centers and having healthcare workers share the correct information on the internet with the caregivers were important. It should be kept in mind that compliance to extended immunization programs can be provided with increase in knowledge on diseases and vaccines and that caregivers are a part of the immunization program.

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