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Kertas Asli/*Original Articles*

Prevalence of Turkish Parent Refusal and Hesitance Rate and Its Associated Factors in Childhood Vaccination

(Prevalens Kadar Penolakan dan Keraguan Vaksinasi Kanak-kanak dan Faktornya Dalam Kalangan Ibu Bapa Turki)

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ABSTRACT

The Rejection of childhood vaccination is still a major issue in many countries. The aim of the study was to assess prevalence of Turkish parent refusal and hesitance rate and its associated factors in Childhood vaccination. A cross-sectional study was carried out at the General Pediatric Poly Clinic of Ankara Keçören Training and Research Hospital from January – to April 2020. Data was collected using a questionnaire via face to face interviews with parents. We included parents who have 6 months to 7 years old children, who visited the clinic during the study period and who accepted to join the study. A total of 809 mothers and 132 fathers participated in the survey. Among the parents, 1.2% of them refused the vaccination of their children and 4.8 % of them had incomplete vaccination of their children. More than half (67.4%) of the parents have a high level of knowledge about vaccines. knowledge level was statistically significantly different based on the participant's occupation, income, education background and father's age (P <0.05). A majority (72.2%) of the participants had good attitudes toward childhood vaccination, there is no statistically significance based on their occupation, age, income and education background (P > 0.05). Parents with one child had bad attitudes towards vaccines (35.4%).

Keywords: Childhood vaccine; vaccine hesitance; vaccine rejection

ABSTRAK

Penolakan vaksinasi kanak-kanak masih merupakan isu yang major di kebanyakan negara. Tujuan kajian ini adalah untuk menilai prevalens kadar penolakan dan keraguan vaksinasi kanak-kanak dalam kalangan ibu bapa Turki. Suatu kajian rentas lintang telah dijalankan di General Pediatric Poly Clinic of Ankara Keçören Training and Research Hospital pada Januari hingga April 2020. Data dikumpulkan dengan soal selidik secara termu bual bersemuka bersama ibu bapa. Ibu bapa yang terlibat mempunyai anak berusia 6 bulan hingga 7 tahun yang telah melawat klinik sepanjang tempoh kajian dan bersetuju untuk terlibat dalam kajian. Seramai 809 orang ibu dan 132 orang ayah yang terlibat. Sebanyak 1.2% daripada mereka menolak vaksinasi untuk anak mereka, manakala 4.8% tidak melengkapkan vaksinasi untuk anak mereka. Lebih daripada separuh daripada mereka (67.4%) mempunyai ilmu yang tinggi terhadap vaksin. Tahap ilmu mereka adalah signifikan berdasarkan pekerjaan, gaji, latar belakang Pendidikan dan umur ayah (P <0.05). Sebilangan besar (72.2%) daripada mereka mempunyai sikap yang baik terhadap vaksinasi kanak-kanak, namun tidak signifikan berdasarkan pekerjaan, umur, gaji dan latar belakang pendidikan (P > 0.05). Ibu bapa dengan seorang anak mempunyai sikap kurang baik terhadap vaksinasi kanak-kanak (35.4%).

Kata kunci: Vaksin kanak-kanak; keraguan vaksin; penolakan vaksin

INTRODUCTION

One of the greatest public health achievements was obtained through vaccination in the last century (CDC n.d.). As the widespread use of vaccines has grown, so have concerns about vaccine safety and their regulation (Larson et al. 2011). World Health Organization's (WHO) Strategic Advisory Group on Immunizations refers to vaccine hesitancy as a delay in acceptance or refusal of vaccines in spite of the availability of vaccine services (WHO n.d.). The aim of vaccination programs is to prevent vaccine-preventable infectious diseases, to reduce the number of deaths or premature sequel (Dubé et al. 2014). However, according to WHO immunization currently prevents 2-3 million deaths every year from diseases like tetanus, measles, influenza, diphtheria and pertussis (WHO 2021)

The vaccines included in the Turkish national vaccination schedule are provided free of charge in the primary health services. The Aim of The Expanded Program of Immunization (EPI) is to reach 95% vaccine coverage for all children and complete the vaccination of up to 90% of children under one year of age (T.C. Sağlık Bakanlığı Bulaşıcı Hastalıklar Daire Başkanlığı 2000). According to the 2019 health statistics yearbook, the rate of getting the vaccines included in the EPI in our country varies between 96% and 99% (T.C. Sağlık Bakanlığı 2021). Increasing cases of child vaccination rejection and hesitation in recent years put our public health successes at risk (World Health Organization 2019). In Turkey, "vaccine hesitancy" started ten years ago. Vaccine refusal cases, which were few in the past, have increased rapidly after a lawsuit was won in 2015 regarding "requesting parental consent for vaccination" and anti-vaccine discourse was frequently covered in the media (Gür 2019).

The one of most concern barriers for vaccine hesitant parents is doubt about the vaccines' safety (Williams 2014a). One of the factors affecting parents' approach to vaccines is parents' knowledge and attitudes .These play an important role in childhood immunization (Matta et al. 2020). Studies reported that improving parents' knowledge about childhood vaccines helps to improve immunization status and achieve a successful immunization program (Qudsia et al. 2004).

In the fight against anti-vaccination; it is essential to investigate the reasons for vaccine hesitancy and vaccine rejection, to conduct scientific studies on methods of increasing social approval of vaccination, and to propose solutions in the light of these researches. In our study, we aimed to assess the prevalence of Turkish parent refusal and hesitance rate and its associated factors in Childhood vaccination.

MATERIAL AND METHODS

A cross-sectional study was carried out at the General Pediatric Poly Clinic of Ankara Keçören Training and Research Hospital from January-April 2020. Data was collected using a questionnaire via face to face interviews with parents. Verbal consent was taken from the participants before answering the questionnaire. The questionnaire has two parts, the first part is about socio-demographic information and the second part is about vaccine rejection. This part had 23 questions. The knowledge, attitude and practice questions were taken from Ciklar's postgraduate thesis (Cıklar 2019). The minimum sample size of the study should be 1056 respondents. These figures were obtained after considering sample size calculation based on sample size estimation for proportion in survey type of studies. The confidence level was 95%, anticipated population proportion was 45% and absolute precision was 30% (Lwanga et al. 1991). We included parents who had 6 months to 7 years old children who visited the clinic during the study period and who accepted to join the study. Parents who didn't respond to the questions properly and refused to answer some important questions were excluded. A pilot study was conducted to assess its clarity, sequencing and time needed to complete the questionnaire. The pilot was done on thirty-five respondents who were chosen to ensure that the questions are easily understood. Scoring for the KAP was decided by researchers. For knowledge, each right response was given a score of 1 while a wrong or unsure response was scored 0. Total knowledge scores can range from 0 to 27. Knowledge scores from 0 to 16 were considered as poor knowledge while knowledge scores of more than 17 were considered as having good knowledge regarding Childhood vaccines. The Attitude on Childhood vaccines patients was assessed using a 6-item questionnaire where attitude scores was from 0 to 2 were considered bad attitude, and scores of 3 to 5 were considered as a good attitude. Ethical approval was obtained from Ankara Keçören Training and Research Hospital ethics committee (decision no: 425.12.2019/2009) and got permission from each participant. Descriptive and analytic statistics were applied. The SPSS 24 packaged software was used for statistical analyses. Frequency, percentage, mean, standard deviation (SD), minimum (min), and maximum (max)

values had been used for descriptive statistics. Chi-square test, Fisher's exact test and Mann-Whitney U test had been used in the comparison of categorical data. p-<0.05 has been accepted for statistical significance.

RESULTS

A total number of 1060 participants joined the study but 119 participant's questionnaires were excluded due to many questions not being answered. Finally, a total of 941 participants were included in the analysis. The majority (n=809) of the participants were mothers. Mothers' ages were between 17 and 57, the mean age was 32.5±6.0. Fathers' ages were between 18 and 64, and the mean age was 35.9±6.3. The majority (n=562) of the mothers were housewives and the majority (n=348) of the fathers were laborers. Half of the parents who participated were university graduates. More than 35% (n = 332) of the participants earn more than 5,000TL per month. Mean number of children was two, a minimum number of children one maximum no of children was six, and about half of the children (40.1%) have one sibling (Table I).

More than 90% of the parents' (n=885) children have had all vaccines. Only 4.8% of parents refused some of the vaccines and 1.2% refused all vaccines. The most refused

Table 1 Socio-demographic characteristics of the participant (n=941)

	(mean years ± SD) (min-max)
Mother's Age	32.5±6.0 (17-57)
Father's Age	35.9±6.3 (18-64)
	Frequancy (%)
Parents	
Mother	809 (86.0)
Father	132 (14.0)
Mother's Occupation,	
Housewife	562 (59.7)
Officer	138 (14.7)
Health worker	77 (8.2)
Laborer	57 (6.1)
Other	107 (11.4)
Father's Occupation	
Laborer	348 (37.0)
Officer	237 (25.2)
Tradesman	95 (10.1)
Health worker	44 (4.7)
Jobless	23 (2.4)
Other	194 (20.6)
Mother's Education	
Primary school	105 (11.1)
Middle School	143 (15.2)
High school	264 (28.1)
University	429 (45.6)
Father's Education	
Primary school	95 (10.1)
Middle School	117 (12.4)
High school	282 (30.0)
University	447 (47.5)
Family income	
≤1000 TL	30 (3.2)
1001-2000 TL	92 (9.8)
2001-3000 TL	248 (26.4)

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3001-5000 TL	239 (25.4)
>5000 TL	332 (35.3)
Number of children	
One	316 (33.6)
Two	377 (40.1)
Three and more	248 (26.3)

Table 2 Children's immunizations status and reasons for vaccine rejection (n=941)

	n (%)
Child's immunization status	
Full Vaccinated	885 (94.0)
Incomplete Vaccination	45 (4.8)
Never Vaccinated	11 (1.2)
Missing Vaccines (n=56)	
Oral Polio (6.months)	34 (60.7)
DTaP-IPV-Hib (6. months)	29 (51.8)
PCV (4. months)	28 (50.0)
Hep-B (6. months)	26 (46.4)
BCG (2. months)	25 (44.6)
DTaP-IPV-Hib (4. months)	24 (42.9)
PCV (2. months)	21 (37.5)
DTaP-IPV-Hib (2. months)	20 (35.7)
Hep-B (1. month)	19 (33.9)
Hep-B (at birth)	15 (26.8)
Reasons of Vaccine Refuse (n=56)	
Because of Adverse Effects	23 (41.1)
Because of an undesired matter in its content	20 (35.7)
Because it is thought to be unnecessary	14 (25.0)
Because of religious reasons	9 (16.1)
Because of illness	7 (12.5)
Because of missing the date	5 (8.9)
Other	16 (28.6)
I'll Have Vaccine If a Domestic Vaccine Produced	
I agree	582 (61.8)
I don't agree	29 (3.1)
I am not sure	330 (35.1)

vaccine (60.7%) was the oral polio vaccine (in the 6th month) (OPV) while the least refused vaccine (26.8%) was the HepB vaccine (at birth). Those who refused some or all of the vaccines were afraid of adverse effects and had doubts about vaccine content (41.1% and 35.7%, respectively). More than half of the participants (61.8%) stated that they would have the domestic vaccine if the domestic vaccine was produced (Table II).

According to our results, 67.4% of the parents have a high level of knowledge about vaccines. There is statistical significance between father's age, occupation, education and family income, and knowledge level about vaccines ($P < 0.05$). There is statistical significance between a mother's occupation and education, and level of knowledge about vaccines ($P < 0.05$). There is no statistical significance between the mother's age, the number of children and knowledge regarding vaccines ($P > 0.05$).

Table III Parents' knowledge on childhood immunization at their demographics

	Knowledge		
	Low (n=306) n (%)	High (n=635) n (%)	p*
Mother's age (year)			
18-29 age	109 (34,7)	109 (34,7)	
30-39 age	158 (31,3)	158 (31,3)	0.590
≥40 age	39 (32,0)	39 (32,0)	
Father's age (year)			
18-29 age	64 (44,8)	79 (55,2)	
30-39 age	154 (29,1)	376 (70,9)	0.002[a]
≥40 age	88 (32,8)	180 (67,2)	
Parent Participating In The Survey			
Mother	264 (32,6)	545 (67,4)	0.853
Father	42 (31,8)	90 (68,2)	
Mother's Occupation			
Housewife	230 (40,9)	332 (59,1)	
Officer	23 (16,7)	115 (83,3)	
Health Worker	10 (13,0)	67 (87,0)	<0.001[a]
Laborer	13 (22,8)	44 (77,2)	
Others	30 (28,0)	77 (72,0)	
Father's Occupation			
Tradesman	21 (22,1)	74 (77,9)	<0.001[a]
Laborer	143 (41,1)	205 (58,9)	
Officer	64 (27,0)	173 (73,0)	
Health Worker	5 (11,4)	39 (88,6)	
Jobless	13 (56,5)	10 (43,5)	
Others	60 (30,9)	134 (69,1)	
Mother's Education			
Primary School	57 (54,3)	48 (45,7)	
Middle School	56 (39,2)	87 (60,8)	<0.001[a]
High school	97 (36,7)	167 (63,3)	
University	96 (22,4)	333 (77,6)	
Father's Education			
Primary School	49 (51,6)	46 (48,4)	
Middle School	56 (47,9)	61 (52,1)	<0.001[a]
High school	95 (33,7)	187 (66,3)	
University	106 (23,7)	341 (76,3)	
Family income			
≤2000 TL	64 (52,5)	58 (47,5)	
2001-3000 TL	98 (39,5)	150 (60,5)	<0.001[a]
3001-5000 TL	75 (31,4)	164 (68,6)	
>5000 TL	68 (20,5)	263 (79,5)	
Number of children			
One	95 (30,1)	221 (69,9)	
Two	116 (30,8)	261 (69,2)	0.075
Three and more	95 (38,3)	153 (61,7)	

*Pearson's Chi-Squared Test; [a]p<0.05

Table 4 shows that 72.2% of the parents had good attitudes about vaccines. No statistical significance between parents' attitudes to vaccines and mother and father age, occupation and education (*P > 0.05*). There is statistical significance between the number of children and parents' attitudes to vaccines (*P <0.01*).

There is statistical significance between the mother's education and the child's immunization status (*P <0.05*). Primary school graduate mothers have the highest rate of missing or never vaccinating (9.5%). There is no statistical significance between a child's immunization status and mother and father's age, occupation, family income, number of children and father's education (*P > 0.05*).

Table IV Parents' attitudes to vaccines at their demographics

	Attitude		p*
	Bad (n=306)	Good (n=680)	
	n (%)	n (%)	
Mother's age (year)			
18-29 age	93 (29,6)	221 (70,4)	
30-39 age	131 (25,9)	374 (74,1)	0.412
≥40 age	37 (30,3)	85 (69,7)	
Father's age (year)			
18-29 age	47 (32,9)	96 (67,1)	
30-39 age	137 (25,8)	393 (74,2)	0.229
≥40 age	77 (28,7)	191 (71,3)	
Parent Participating In The Survey			
Mother	219 (27,1)	590 (72,9)	0.259
Father	42 (31,8)	90 (68,2)	
Mother's Occupation			
Housewife	171 (30,4)	391 (69,6)	
Officer	32 (23,2)	106 (76,8)	
Health Worker	14 (18,2)	63 (81,8)	0.131
Laborer	16 (28,1)	41 (71,9)	
Others	28 (26,2)	79 (73,8)	
Father's Occupation			
Tradesman	31 (32,6)	64 (67,4)	
Laborer	97 (27,9)	251 (72,1)	
Officer	70 (29,5)	167 (70,5)	<0.001[a]
Health Worker	7 (15,9)	37 (84,1)	
Jobless	8 (34,8)	15 (65,2)	
Others	48 (24,7)	146 (75,3)	
Mother's Education			
Primary School	26 (24,8)	79 (75,2)	
Middle School	37 (25,9)	106 (74,1)	0.764
High school	78 (29,5)	186 (70,5)	
University	120 (28,0)	309 (72,0)	
Father's Education			
Primary School	22 (23,2)	73 (76,8)	
Middle School	29 (24,8)	88 (75,2)	0,507
High school	85 (30,1)	197 (69,9)	
University	125 (28,0)	322 (72,0)	
Family income			
≤2000 TL	36 (29,5)	86 (70,5)	

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2001-3000 TL	67 (27,0)	181 (73,0)	
3001-5000 TL	78 (32,6)	161 (67,4)	
>5000 TL	79 (23,9)	252 (76,1)	
Number of children			
One	112 (35,4)	204 (64,6)	
Two	75 (19,9)	302 (80,1)	<0.001[a]
Three and more	74 (29,8)	174 (70,2)	

Table V Distribution of some descriptive characteristics of parents according to their child's vaccination status

	Child's immunization status		p
	Full Vaccinated (n=885)	Incomplete/ Never (n=56)	
Mother's age (year)	32.5±6.1 (17-57)	31.7±5.6 (20-47)	0.360*
Father's age (year)	36.0±6.3 (18-64)	34.8±5.8 (27-57)	0.121*
Mother's Occupation			
Health Worker	74 (96.1)	3 (3.9)	0.615[b]
Others	811 (93.9)	53 (6.1)	
Father's Occupation			
Health Worker	41 (93.2)	3 (6.8)	0.762[b]
Others	844 (94.1)	53 (5.9)	
Mother's Education			
Primary School	95 (90.5)	10 (9.5)	
Middle School	140 (97.9)	3 (2.1)	0.035[ac]
High school	243 (92.0)	21 (8.0)	
University	407 (94.9)	22 (5.1)	
Father's Education			
Primary School	91 (95.8)	4 (4.2)	
Middle School	112 (95.7)	5 (4.3)	0.590[a]
High school	266 (94.3)	16 (5.7)	
University	416 (93.1)	31 (6.9)	
Family income			
≤2000 TL	110 (90.2)	12 (9.8)	
2001-3000 TL	240 (96.8)	8 (3.2)	0.051[a]
3001-5000 TL	221 (92.5)	18 (7.5)	
>5000 TL	314 (94.6)	18 (5.4)	
Number of children	2.0±0.9 (1-6)	2.1±1.1 (1-6)	0.797*
One	297 (94.0)	19 (6.0)	
Two	356 (94.4)	21 (5.6)	0.900[a]
Three and more	232 (93.5)	16 (6.5)	

*Mann-Whitney U Test; [a]Pearson's Chi-Squared Test, [b]Fisher's exact test [c]p<0.05

There is statistical significance between a child's immunization status and knowledge level about vaccines (*P <0.01*). We found that 70.1% of the participants whose children were vaccinated had a high level of knowledge. The majority of the participants (%71.2) who missed vaccine appointments or never vaccinated their children had less knowledge (Table 6).

There is statistical significance between child's immunization status and parent's attitude towards vaccination (P <0.01). We found that %76.5 of the participants whose children were vaccinated had a good attitude. More than 90% participants, who missed vaccine appointments or never vaccinated their children, had a bad attitude (Table 6).

Table 6 Vaccine knowledge levels and attitude according to vaccination status

	Knowledge		
	Low(n=306) (%)	High (n=635) (%)	
Child's immunization status (n=941)			
Full Vaccinated	264 (29,9)	618 (70,1)	
Incomplete/Never Vaccinated	42 (71,2)	17 (28,8)	<0.001[a]
	Attitude		
	Bad (n=261) (%)	Good (n=680) (%)	
Child's immunization status (n=941)			
Full Vaccinated	207 (23,5)	675 (76,5)	
Incomplete/Never Vaccinated	54 (91,5)	5 (8,5)	<0.001[a]

*Pearson's Chi-Squared Test, ap<0.05

DISCUSSION

Concerns regarding vaccines are a common problem in the whole world and not only in Turkey. It has been seen that there was at least one vaccine hesitancy related notice from 185 countries in 2014 and from 184 countries in 2016 among the 194 countries which are members of WHO in a study that was conducted based on the WHO/UNICEF Common Report (Lane et al. 2018)"ISSN":"18732518"," abstract":"In order to gather a global picture of vaccine hesitancy and whether/how it is changing, an analysis was undertaken to review three years of data available as of June 2017 from the WHO/UNICEF Joint Report Form (JRF.

The Majority (86%) of the participants were mothers while 14% of them were fathers in our study which was conducted with the purpose of evaluating the knowledge, attitudes and practice regarding childhood vaccines of the parents. Features such as age, occupation, and education level have been questioned to both parents. Our study population has shown a lesser vaccination ratio than Turkey's national data reported by the Ministry of Health for each vaccine (T.C. Sağlık Bakanlığı Sağlık Bilgi Sistemleri Genel Müdürlüğü 2020). This fact can be associated with data being collected in merely one district of Ankara. Nevertheless, our ratios are similar to full vaccination ratios that Üzüm et al. had found in their studies to be 91%,4 for 2 years old and younger children and 94%,8 for children older than 2 years old (Üzüm et al. 2019). The Oral polio vaccine is one of the most rejected vaccines while the Hepatitis B vaccine is the less rejected one in our study. Similar findings has reported by İlter (İlter 2020).

According to our results; fear of the side effects, the presence of unwanted substances in the vaccines, and seeing vaccination as unnecessary are the main reasons for parents' deficient vaccination decisions. Reasons for vaccine rejection are investigated in lots of studies in the literature and these reasons are determined (Kempe et al. 2011; Gaudino & Robison 2012; Salmon et al. 2009; Gilkey et al. 2013; Wenger et al. 2011; LaVail & Kennedy 2012; McCauley et al. 2012; Smith et al. 2011; Luthy et al. 2011; Luthy et al. 2012; Erdem et al. 2017; Bekis Bozkurt 2018)8% of physicians reported that <10% of parents refused a vaccine and 20% reported that <10% of parents requested to spread out vaccines in a typical month. More pediatricians than FM physicians reported always/often requiring parents to sign a form if they refused vaccination (53% vs 31%, p<0.0001. Concerns regarding vaccine security are the leading ones. Parents think that vaccines aren't safe and substances such as thiomersal, in them might cause autism (Bekis Bozkurt 2018; Borràs et al. 2009; Offit & Coffin 2003)the large part of the world and in our country polio and neonatal tetanus has been eradicated, and the incidence of other diseases in the program has declined markedly. While The World Health Organization (WHO. Vaccination rates in Turkey have not decreased even though these claims are proved to be unfounded several times, thiomersal, has been removed from vaccines in 2001 and 2009 in America and Turkey respectively (T.C. Sağlık Bakanlığı 2018). Burghouts et al. (2017) have found mothers' concern about side effects of vaccines in Venezuela. Concerns regarding side effects and trust issues are among the main reasons for rejecting or delaying vaccination in lots of areas of the world including western societies like in our study (Vonasek et al. 2016; Cobos Muñoz et al. 2015; Williams 2014b; Aggarwal 2018)parents' understanding and perception of childhood immunizations has largely been overlooked. The aims of this study were to survey mothers' knowledge and attitudes towards childhood immunizations and then determine if these variables correlate with the timely vaccination coverage of their children. From September

to December 2013, we conducted a cross-sectional survey of 1,000 parous women in rural Sheema district in southwest Uganda. The survey collected sociodemographic data and knowledge and attitudes towards childhood immunizations. For the women with at least one child between the age of one month and five years who also had a vaccination card available for the child (N = 302. While most of the parents have addressed that they would accept if local vaccines are available.

Most of the parents in our study have high levels of knowledge about vaccines. Considering the full vaccination rate of 94%, we can't state that all of the parents who had full vaccinations have high levels of knowledge. These parents might be administering the vaccines because they think vaccination is obligatory or because they're convinced of the vaccination necessity by their doctors. Benin et al. have found in their study that trust in pediatricians and being satisfied in discussion with the pediatrician about vaccines positively affect the practice towards vaccines (AL et al. 2006). On the other hand; even though obligatory vaccination seems to be working in some cases, it doesn't provide an absolute solution to vaccine rejection. Salmon et al. have stated that there was no significant difference in vaccination rates between the countries suggesting specific vaccines and the countries necessitating them (MacDonald et al. 2018). While there was no significant difference between mothers' and fathers' vaccine knowledge levels, it was seen that being a healthcare professional or having higher levels of education increases the level of knowledge in both mothers and fathers. Levels of knowledge about vaccines were lower among the parents in the low income category. Increasing education level and income status upgrades the level of knowledge about vaccines. Studies showing paralleled with these conclusions of our study are present in the literature (Borràs et al. 2009; Abdulrahman Albarraq et al. 2013; Papazoglou et al. 2013)there is some reluctance in a proportion of the population. Negative parental perceptions of vaccination are an important barrier to paediatric vaccination. The aim of this study was to investigate parental knowledge of paediatric vaccines and vaccination in Catalonia. Methods. A retrospective, cross-sectional study was carried out in children aged < 3 years recruited by random sampling from municipal districts of all health regions of Catalonia. The total sample was 630 children. Parents completed a standard questionnaire for each child, which included vaccination coverage and knowledge about vaccination. The level of knowledge of vaccination was scored according to parental answers. Results. An association was observed between greater vaccination coverage of the 4:4:4:3:1 schedule (defined as: 4 DTPa/w doses, 4 Hib doses, 4 OPV doses, 3 MenC doses and 1 MMR dose.

It has been seen that approximately one-third of the parents in our study have bad attitudes towards vaccines. There haven't been any differences in the parents' attitudes towards vaccines with regards to parents' ages, occupations, education levels and income statuses. Solely, it has been seen that parents with 2 and more children have a better attitude than the parents with only one child. It is thought that the positive experiences that parents with more than one child had with the previous child might be positively affecting the approaches to vaccines. Gülgün et al. had found that vaccination rates are increased by the number of children (Gülgün et al. 2014). Studies showing exactly the opposite are also present in the literature (Üzüm et al. 2019; Reading et al. 2004; Yiğitalp & Ertem 2008).

Prislin et al. (1998) has stated that parents who have a better education have less hesitant attitudes towards immunization while Olszewska et al. (2017) concluded that parents with high education level and who live in the city have a higher possibility of believing to vaccine toxicity. There are no statistical significant differences between parents' socio-demographic features and vaccination statuses except for mother education in our study. The highest rate of non-vaccination has been found among mothers with a primary school education background.

More than two-third of the parents who either incomplete the vaccination or didn't vaccinate at all to their children had low level of knowledge about vaccines and it was seen that almost all of the parents had a bad attitude towards vaccines. Similarly, with our study, Altreyfy et al. and Borras et al. (2009) have found in their studies, the relationship between vaccine knowledge and vaccine administrations that increasing vaccine knowledge affects the vaccine administrations positively (Ewad Alkarim et al. 2019; Borràs et al. 2009). Studies demonstrated that education programs for improving parents' knowledge might increase the success rate of vaccination programs in a country (Olszewska et al. 2017; Ewad Alkarim et al. 2019; AI et al. 2014). Some limitations are present in our study. Even though the goal of the Turkish national childhood immunization program is to cover a hundred percent for the child population in the country and to provide all the childhood vaccines in the program for free of charge the vaccine rejection and incompletion rate is still 1.2% and 4.8%, respectively. There may be some possible limitations in this study. The study was conducted in a single center and the findings might not represent all Turkish parents, another limitation of the study is the memory factor, participants may not be able to correctly remember the events that occurred in the past.

CONCLUSION

Among the participants, 11 (1.2%) of them refused the vaccination of their children and 4.8 % of them had an incomplete vaccination of their children. One of the most reasons for rejecting childhood vaccination was due to side effects, undesired matter in its content and thoughts it's unnecessary to give the vaccines to their children. Nearly two-thirds of the participant's knowledge score was high (67.4%) regarding childhood immunization while 72.2% of the participant's attitude was good towards childhood immunization.

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