



Determining the Relationship of Parents, Knowledge and Attitudes and Health Literacy About the Admission or Refusal of Childhood Immunization

Ebeveynlerin Çocukluk Çağı Aşılarının Kabulünün Sağlık Okuryazarlığı ile İlişkisi

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Abstract

Objective: This research was conducted to determine the knowledge and attitudes of parents about vaccine acceptance or rejection and to evaluate their relationship with health literacy.

Material and Methods: This descriptive study was conducted with the parents of 220 pediatric patients who were admitted to the pediatric and pediatric infection outpatient clinic/service of Çukurova University Balcalı Hospital. The data were collected by using Personal Information Form and Health Literacy Scale.

Results: The mean age of the mothers was 30.20 ± 5.89 , and the average health literacy score was 106.80 ± 17.4 . A statistically significant difference was found between the variables of education status ($p < 0.001$), employment status ($p = 0.005$), social security status ($p < 0.001$), the number of children ($p < 0.001$), their knowledge and attitudes about vaccination ($p = 0.004$), the status of paid vaccination for their children, the reason for not having paid vaccinations ($p = 0.004$), and the total score averages of the health literacy scale.

Conclusion: In this study, it was determined that the vast majority of mothers accepted vaccines and the health literacy levels of the mothers were sufficient. Besides, the health literacy levels of the mothers were affected by education status, income status, employment status of the mother, social security status, the number of children, the status of paid vaccination for their children, the reason for not having paid vaccinations.

Keywords: Vaccination, child, parent, health literacy

Öz

Giriş: Bu araştırma, aşı kabulü veya reddi hakkında anne/babaların bilgi ve tutumlarını belirlemek ve bunların sağlık okuryazarlığı ile ilişkisini değerlendirmek amacıyla yürütülmüştür.

Gereç ve Yöntemler: Tanımlayıcı tipteki bu araştırma, Çukurova Üniversitesi Balcalı Hastanesi Çocuk Sağlığı ve Hastalıkları Polikliniği ile Çocuk Enfeksiyon Poliklinik/Servisine başvuran 220 çocuk hastanın ebeveynleriyle yürütülmüştür. Araştırma verileri Kişisel Bilgi Formu ve Sağlık Okuryazarlığı Ölçeği ile toplanmıştır.

Bulgular: Annelerin yaş ortalaması 30.20 ± 5.89 , sağlık okuryazarlığı toplam puan ortalaması ise 106.80 ± 17.4 olarak saptanmıştır. Annelerin eğitim durumu ($p < 0.001$), çalışma durumu ($p = 0.005$), sosyal güvence durumu ($p < 0.001$), çocuk sayısı ($p < 0.001$), çocuklarına ücretli aşı yaptırmama durumu ($p = 0.004$) ve çocuklarına ücretli aşı yaptırmama nedeni değişkenleri ($p = 0.004$) ile sağlık okuryazarlığı ölçeği toplam puan ortalamaları arasında istatistiksel olarak anlamlı farklılık saptanmıştır.

Sonuç: Bu çalışmada annelerin büyük çoğunluğunun aşıları kabul ettiği ve annelerin sağlık okuryazarlığı düzeylerinin yeterli olduğu saptanmıştır. Ayrıca annelerin sağlık okuryazarlık düzeylerinin eğitim durumu, gelir durumu, annenin çalışma durumu, sosyal güvence durumu, çocuk sayısı, ücretli aşı yaptırmama durumu ve ücretli aşı yaptırmama nedenleri değişkenlerinden etkilendiği belirlenmiştir.

Anahtar Kelimeler: Aşı, çocuk, ebeveyn, sağlık okuryazarlığı

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Introduction

Immunization is one of the most effective, reliable, and economic ways to protect the public from infectious diseases (1), and the main objective is to prevent disabilities, deaths, and the occurrence of vaccine-preventable diseases particularly in infants and children (2). According to the data of World Health Organization (WHO), over 100 million children get vaccinated before the age of 1 year thanks to vaccine implementations, and 2.5 million children avoid death each year (3).

As of 2018, vaccination rates are 90% in Europe and the USA and around 70-80% in countries like Afghanistan, Nigeria, Pakistan, and India (2). Regarding the 2017 data, vaccination rates diminished in Turkey, the rates, which were 98% in 2016, dropped to 96% in 2017 (4). The number of families that refuse to get their children vaccinated was 183 in 2011, and in 2018, this number reached to the level of 23 thousand (4). In a study conducted in Turkey, it has been reported that 3/10 of young females with high socioeconomic levels refuse vaccination or are irresolute (5).

Health Literacy (HL) is the ability to appreciate many healthy actions related to health. WHO has defined HL as "the capacity to obtain, understand and use basic health information to protect and sustain health" (6).

Information on vaccines is complicated, and thus some degree of literacy and logic is needed to understand this information. If health literacy level of the patients is low, it becomes more difficult to explain vaccines. Particularly social media, constantly increasing information pollution and not being able to reach correct information can be considered as a potential determinant in experiencing vaccine hesitations (7).

When the literature is reviewed, it is observed that there have been many studies conducted in the world and in our country on vaccination acceptance or refusal (8-10), but there are very few studies investigating the relation between vaccine acceptance or refusal and HL. In studies carried out on immunization rates, it has been determined that young age, incomplete and incorrect information, education, low socioeconomic and sociocultural status negatively affect immunization rates. Besides, it has also been stated that families with high socioeconomic level have started refusing vaccines or remained irresolute on the matter in recent years in developed countries and in our country (11-14).

Influential interaction with the parents can be an efficient method in overcoming anti-vaccination. The positive effect of correct, reliable and influential methods in enabling communication has been emphasized in studies on vaccines and drugs (7). In addition, informing parents on vaccines and their effects and the comprehension and interpretation of these information by the parents are highly important (15). Therefore,

it is possible to indicate that the level of HL is crucial in experiencing vaccine acceptance or refusal.

It is speculated by this study that an important gap will be filled and a basis for the steps to be taken will be provided in understanding mothers who accept, refuse, or show hesitancy towards vaccines. Moreover, this study was also carried out due to the fact that studies investigating the relation between vaccine acceptance or refusal and HL are scant and that the knowledge and attitudes of mothers having children aged between 0-5 years regarding vaccine acceptance or refusal should be determined and their relation with HL should be evaluated.

Materials and Methods

Research Type

This research has a descriptive design.

The Place and Duration of Research

The research was conducted with the mothers of child patients presenting to Çukurova University, Balcalı Hospital, Pediatric Health and Pediatric Infectious Diseases Polyclinics between 15 November 2019 and 15 January 2020.

Research Population and Sample

The research population comprised 480 mothers who had children aged 0-5 years presenting to Çukurova University, Balcalı Hospital, Pediatric Health and Pediatric Infectious Diseases Polyclinics. Considering the number of mothers meeting research criteria and presenting to relevant departments, simple random sampling was performed and the research was carried out with 220 mothers.

The research included mothers aged 18 years and over with good communication skills in Turkish and children aged 0-5 years. Mothers who were foreigners and immigrants, mothers with problems in communication and those with mental incapacity were excluded.

Data Collection Form and Methods

Research data were collected with personal information form and Health Literacy Scale (HLS).

Personal Information Form

The personal information form is a form consisting 33 questions regarding sociodemographic features of the mothers and their knowledge and attitudes on vaccines, which was prepared by the researchers themselves in line with literature data (1,8,16-18).

Health Literacy Scale

The HLS-EU (Health Literacy Survey in Europe) scale with 47 items was developed by Sorensen in 2013 (19) and then revised and simplified by Toçi, Bruzari (20) and Sorenson et al. (2013) as Health Literacy Scale (HLS). Its validity and reliability

in Turkey was performed by Aras and Temel in 2017 (19-21). HLS is comprised of 25 items and 4 sub-scales. Access to Information includes five items (items 1 to 5), and the minimum and maximum scores to be received from this sub-scale are 5 and 25, respectively. Understanding Information has seven items (items through 6 and 12), and the minimum and maximum scores to be received from this sub-scale are 7 and 35, respectively. Valuation/Evaluation sub-scale includes eight items (items 13 to 20), and the minimum and maximum scores to be received from this sub-scale are 8 and 40, respectively. Implementation/Utilization sub-scale has five items (items through 21 to 25), and the minimum and maximum scores to be received from this sub-scale are 5 and 25, respectively. Minimum and maximum scores for the whole scale are 25 and 125, respectively. This Likert-type scale is responded by the participants as "5: I have no difficulty, 4: I have slight difficulty, 3: I have some difficulty, 2: I have a lot of difficulty, 1: I am not capable/I have no capacity/impossible. All items of the scale have a positive nature, there are no reverse items. Time needed for the completion of the scale is 5-10 minutes. Low scores show that health literacy is insufficient, problematic and weak; high scores demonstrate sufficient and very good health literacy. The higher the score is, the higher the health literacy of the participant is. Cronbach Alpha coefficient of the scale was found as 0.92 in the validity study (21).

In this study, the Cronbach Alpha value of the scale was found as 0.93, and sub-scale Cronbach Alpha value was detected between the range of 0.75-0.87.

Data Collection

Data were collected from the mothers of child patients aged 0-5 years presenting to Çukurova University, Balcalı Hospital, Pediatric Health and Pediatric Infectious Diseases Polyclinics. Face-to-face interview technique was used in data collection, and it took approximately 15 minutes to collect the data.

Data Analysis

For the evaluation of research findings, IBM SPSS Statistics 20 (IBM SPSS, Turkey) program was used for statistical analyses. In the evaluation of data, apart from descriptive statistical methods (mean, standard deviation, frequency, min-max), Independent Sample t test was used for the comparisons between two groups, Kruskal Wallis H test and One-Way ANOVA test were used for comparisons between more than two groups, and post hoc test and dual comparisons in Kruskal Wallis H test were used to detect the group causing the difference. $p < 0.05$ was accepted as statistically significant.

Ethics Aspect of the Research

Approval was obtained from the Ethics Board of Çukurova University, Faculty of Medicine (2019/93/23), and Academic Board approval was also received from the Department of Pediatrics. Written and oral informed consent was also obtained

from the parents participating in the research by explaining its objective.

Results

Mean age of the mothers participating in the study was 30.20 ± 5.89 years. Forty-six point four percent of them were primary school and secondary school graduates, 53.6% had a bad perception of income, 95.9% stated that vaccines were necessary, 4.1% indicated that getting vaccinated was not necessary or that they were irresolute about the issue. The reason for being irresolute or against vaccination was that 3.2% of the mothers believed that vaccines contained harmful substances and did not trust vaccine companies. Table 1 and Table 2 summarizes other sociodemographic and vaccine-related information of the parents.

Mean total score of HLS in this research was 106.80 ± 17.44 . Moreover, mean score of the "Access to Information" sub-scale was 21.08 ± 4.54 , that of "Comprehending Information" was 29.08 ± 5.54 , that of "Valuation/Evaluation" was 39.32 ± 6.62 , and that of "Implementation/Utilization" was 17.30 ± 3.15 .

When findings related to the comparison of mean total HLS score according to some personal characteristics of the mothers, a significant difference was determined between mean HLS scores in terms of the education status of the mothers ($p < 0.001$). As a result of the further analysis conducted, the difference was determined to have been caused by the illiterate group ($p < 0.005$) (Table 4).

Significant difference was detected between mean total HLS scores of the mothers in terms of the mothers' perception of income ($p < 0.001$). As a result of the further analysis conducted, the difference was determined to have been caused by the group with bad income status ($p < 0.001$) (Table 4).

Significant difference was detected between mean total HLS scores of the mothers in terms of their employment status and social security status ($p = 0.005$; $p < 0.001$). Mean total HLS score of working mothers with social security was detected higher ($p < 0.001$) (Table 4).

Significant difference was detected between mean total HLS scores of the mothers in terms of the number of children ($p < 0.001$). As a result of the further analysis conducted, the difference was found to have resulted from the group with three or more children ($p < 0.001$) (Table 4).

When the results related to the comparison of mean HLS scores of the mothers according to their knowledge and attitude towards vaccines are evaluated, a significant difference was not detected between the total HLS scores of the mothers in terms of the necessity of getting vaccinated ($p = 0.933$) (Table 5).

A significant difference was detected between the mothers' total HLS scores and the condition of getting their children

Table 1. Mothers' sociodemographic characteristics

Characteristics	X ± Ss	Min-Max
Mean age of the child (month)	25.70 ± 18.74	1-60
Mean age of the mother (year)	30.20 ± 5.89	19-55
Mean age of the father (year)	34.15 ± 6.14	20-55
Mean number of children	2.58 ± 1.39	1-11
	Number	%
Mother's age		
25 years and under	55	25.0
25 years and over	164	74.5
Mother's education level		
Illiterate	27	12.2
Primary/secondary school	102	46.4
High school	58	26.4
University	33	15.0
Mother's employment status		
Employed	25	11.4
Unemployed	195	88.6
Perception of income		
Good	96	43.6
Fair	6	2.7
Bad	118	53.6
Social security status		
Existing	165	75.0
None	54	24.5
Place of Inhabit		
Province	173	78.6
County	47	21.4
Number of children		
Single child	47	21.4
1-2	132	60.0
3 and more	41	18.6

immunized with paid vaccinations. Mean total HLS scores of the mothers getting their children immunized with paid vaccinations was found higher ($p=0.004$) (Table 5).

Significant difference was detected the mothers' total HLS scores and the reason of not getting their children immunized with paid vaccinations. As a result of the further analysis conducted, the difference was found to have been caused by the group with no financial opportunity ($p=0.004$) (Table 5).

A significant difference was detected between the mothers' total HLS scores and the condition of getting their children immunized with paid vaccinations. Mean total HLS scores of the mothers getting their children immunized with pay vaccines was found higher ($p=0.004$) (Table 5).

Discussion

In this study conducted to determine the association between HL and childhood vaccine acceptance or refusal of mothers with children aged 0-5 years, it was determined that a majority of the mothers accepted the vaccines and HL levels of the mothers were sufficient.

Immunization is one of the most effective means of public health to prevent and eradicate infectious diseases, to diminish deaths and to improve health (22). In this study, 95.9% of the mothers indicated that vaccines are necessary. In studies by Özceylan et al. (2020) (5) and by Ertuğrul (2019) (23), 89.3% of the mothers and 95.3% of the parents have been reported to have stated that vaccination was necessary, respectively. Veldwijk et al. (2015) have reported that 90% of the parents considered getting their newborn children vaccinated (12). Our study results are parallel to other research results showing that the importance given to vaccines is high, and we put forward that parent sensitivity towards getting their children vaccinated was at a satisfying level.

In our study, 97.7% of the mothers were detected to have knowledge on vaccines, 82.7% of whom obtained information from nurses/midwives/health staff and 46.4% of whom obtained information from physicians. 80.1% of the parents in the study by Soyer et al. (2011) (24) and 61.1% of the mothers in the study by Arlı (2018) (17) have stated that they obtained information on vaccines from physicians.

Table 2. Mothers' characteristics related to their knowledge and attitude towards vaccines

Characteristics	Number	%
Do you have knowledge on vaccines?		
Yes	215	97.7
No	5	2.3
Do you think vaccines are necessary?		
Yes	211	95.9
No	2	0.9
Neutral	7	3.2
What is the reason if vaccines are not necessary? (n= 9)		
I believe they contain harmful substances and I do not trust vaccine companies	7	3.2
I have heard on tv and the internet that they are harmful	1	0.5
I do not trust healthcare workers	1	0.5
From where or whom did you get the information? (n= 215)		
Nurse/midwife/health staff	182	82.7
Physician	102	46.4
Tv-radio-newspaper-internet	77	35.0
Neighbours/relatives	34	15.5
Knowledge on vaccines (n= 213)		
Protects from diseases	198	90
Provides immunity against microbes	182	82.7
To be healthy	176	80
I do not know	7	3.2
How bad is it if your child does not get vaccinated? (n= 213)		
Infection risk increases	177	80.5
Suffers from infectious diseases	188	85.5
Gets sick quickly	180	81.8
Gets sick more frequently	176	80.0
Suffers from diseases severely	177	80.5
Can catch lethal infectious diseases	150	68.2
Can have a disability following the infectious disease	134	60.9
I do not know	7	3.2
Do vaccines have side effects?		
Yes	139	63.2
No	48	21.8
I do not know	33	15.0
What are the side effects of vaccines? (n= 187)		
Fever	135	61.4
Infection	47	21.4
Allergy	75	34.1
Stroke	41	18.6
Pain	83	37.7
What are the childhood vaccines that you know of? (n=1 62)		
Measles	94	42.7
Hepatitis B	86	39.1
Tuberculosis	64	29.1
Varicella	45	20.5
Tetanus	39	17.7
Polio	29	13.2
Are you informed about paid vaccinations?		
Yes	110	50
No	110	50
Have you got your child vaccinated with paid vaccinations?		
Yes	16	7.3
No	204	92.7

Table 2. Mothers' characteristics related to their knowledge and attitude towards vaccines (continue)

Characteristics	Number	%
What is the reason for not getting paid vaccinations? (n= 204)		
I have no information on the matter	110	50
I have no financial possibilities	53	24.1
I do not think they are necessary	41	18.6
Under what circumstances are vaccines postponed?		
Infection	145	65.9
High fever	157	71.4
There are no obstacles	8	3.6
I do not know	29	13.2

Table 3. Mothers' mean HL scores

Sub-scales	X ± Ss	Min-max	Cronbach Alfa
Access to information	21.08 ± 4.54	5-25	0.856
Comprehending information	29.08 ± 5.54	7-35	0.788
Valuation/Evaluation	39.32 ± 6.62	12-45	0.870
Implementation/Utilization	17.30 ± 3.15	4-20	0.757
Total	106.80 ± 17.44	29-125	0.935

Table 4. Comparison of mothers' mean HLS scores according to some informative characteristics

	Access to Information X ± Ss	Comprehending Information X ± Ss	Valuation/Evaluation X + Ss	Implementation/ Utilization X + Ss	HL X + Ss
Mothers' education level					
Illiterate	16.33 ± 6.1	22.18 ± 7.4	34.29 ± 9.0	15.77 ± 3.7	88.59 ± 24.0
Primary/Secondary school	20.71 ± 4.4	29.22 ± 4.9	39.20 ± 6.6	17.01 ± 3.4	106.16 ± 16.7
High school	22.58 ± 2.8	30.31 ± 3.7	40.44 ± 5.1	17.75 ± 2.3	111.10 ± 11.3
University	23.45 ± 2.3	32.15 ± 3.1	41.81 ± 4.0	18.66 ± 1.8	116.09 ± 9.6
	F= 18.827 p= 0.000**	F= 24.009 p= 0.000**	F= 8.003 p= 0.000**	F= 5.110 p= 0.002*	F= 17.312 p= 0.000**
Perception of income					
Bad	19.64 ± 5.2	27.72 ± 6.3	37.78 ± 7.8	16.67 ± 3.6	101.83 ± 20.3
Fair	23.16 ± 2.7	30.66 ± 4.5	41.16 ± 5.4	17.66 ± 2.7	112.66 ± 13.0
Good	22.71 ± 2.8	30.66 ± 3.9	41.09 ± 4.2	18.06 ± 2.2	112.54 ± 10.7
	X²= 24.228 p= 0.000**	X²= 11.809 p= 0.003*	X²= 9.919 p= 0.007*	X²=7.603 p= 0.022*	X²= 17.643 p= 0.000**
Mothers' employment status					
Employed	23.92 ± 2.4	32.20 ± 3.8	43.24 ± 2.3	18.84 ± 1.9	118.20 ± 8.5
Unemployed	20.71 ± 4.6	28.68 ± 5.6	38.82 ± 6.8	17.11 ± 3.2	105.33 ± 17.7
	t= -5.389 p= 0.000**	t= -3.037 p= 0.054	t= -6.537 p= 0.000**	t= -3.808 p= 0.016*	t= -6.040 p= 0.005*
Social security status					
Existing	22.03 ± 3.5	29.96 ± 4.2	40.50 ± 4.8	17.78 ± 2.5	110.29 ± 12.4
None	18.09 ± 5.8	26.31 ± 7.7	35.62 ± 9.4	15.81 ± 4.2	95.85 ± 24.8
	t= 4.650 p= 0.000**	t= 3.304 p= 0.000**	t= 3.628 p= 0.000**	t= 3.223 p= 0.000**	t= 4.108 p= 0.000**
Number of children					
Singe childe	21.97 ± 3.7	30.04 ± 4.2	40.02 ± 5.6	18.12 ± 2.2	110.17 ± 12.8
1-2	21.71 ± 3.9	29.61 ± 5.1	40.08 ± 5.8	17.56 ± 2.8	108.97 ± 15.4
3 and more	18.00 ± 5.7	26.29 ± 7.0	36.07 ± 8.8	15.56 ± 4.1	95.92 ± 23.2
	F= 12.879 p= 0.000**	F= 6.842 p= 0.001*	F= 6.353 p= 0.002*	F= 8.897 p= 0.000**	F= 10.752 p= 0.000**

t: Independent Sample t test, F: One-Way ANOVA, X²: Kruskal Wallis H test.

*p< 0.05

**p< 0.001

Table 5. Comparison of mothers' mean HLS score according to their knowledge and attitude towards vaccines

	Access to Information X ± SS	Comprehending Information X ± SS	Valuation/Evaluation X ± SS	Implementation/Utilization X ± SS	HL X ± SS
Do you think vaccines are necessary?					
Yes	21.11 ± 4.5	29.06 ± 5.5	39.34 ± 6.6	17.29 ± 3.1	106.8 ± 17.5
No	21.00 ± 4.2	30.00 ± 1.4	40.00 ± 0.0	18.50 ± 2.1	109.50 ± 7.7
Neutral	20.14 ± 4.9	29.42 ± 5.0	38.57 ± 6.9	17.42 ± 2.2	105.57 ± 17.2
	X²= 0.497 p= 0.780	X²= 0.045 p= 0.978	X²= 0.237 p= 0.888	X²= 0.322 p= 0.851	X²= 0.138 p= 0.933
Have you got your child vaccinated with paid vaccinations?					
Yes	23.50 ± 2.5	31.83 ± 3.2	41.78 ± 4.4	18.23 ± 2.0	115.35 ± 10.0
No	20.51 ± 4.7	28.43 ± 5.7	38.74 ± 6.9	17.08 ± 3.3	104.78 ± 18.2
	t= 5.654 p= 0.000**	t= 5.102 p= 0.002*	t= 3.529 p= 0.010*	t= 2.834 p= 0.016*	t= 5.107 p= 0.004*
The reasons for not getting paid vaccinations (n=178)					
No information	20.58 ± 4.9	28.14 ± 6.1	38.60 ± 7.0	17.06 ± 3.2	104.39 ± 19.1
No financial possibility	10.94 ± 4.6	28.86 ± 5.4	38.13 ± 7.3	16.71 ± 3.7	103.66 ± 18.3
Do not think they are necessary	23.09 ± 2.5	30.73 ± 3.6	42.00 ± 3.2	18.43 ± 2.0	114.26 ± 9.1
	F= 6.424 p= 0.002*	F= 3.190 p= 0.043*	F= 4.860 p= 0.009*	F= 3.772 p= 0.025*	F= 5.593 p= 0.004*

t: Independent Sample t test, F: One-Way ANOVA, X²: Kruskal Wallis H test.
*p< 0.05.
** p< 0.001.

In our study, 4.1% of the mothers expressed that they were irresolute and getting their children vaccinated was not necessary, and 3.2% of these mothers stated that their hesitation was due to the fact that vaccines contained harmful substances and they did not believe in vaccine companies. The study by Yazıcı (2018) (1) has detected that 39% of the parents did not trust the content of vaccines. In the studies by Özceylan et al. (2020) (5) and Bozkurt'un (2018) (25), the most common cause of vaccine hesitation has been found as lack of confidence in vaccine companies. Ertuğrul's study (2019) has pointed out that 4.7% of the parents thought that getting their children vaccinated was not necessary and that they did not trust the vaccines (2.5%) and were afraid of the side effects of the vaccines (2.2%) (23). The reason for the low rate of hesitant mothers or mothers who do not want their children to get the vaccines is believed to be the result of a performance system implemented by the state in the follow-up of childhood vaccinations, and thus vaccine-related policies in the state's preventive health service are strong and healthcare workers exhibit a highly positive effort.

In this research, mothers' health literacy levels were determined to be sufficient. According to the results of a study conducted by the Directorate General of Health Improvement of the Ministry of Health to identify health literacy levels in Turkey and related factors (2019), 7%, 23.4%, 38%, and 39.9% of the participants have been reported to have perfect, sufficient, problematic-limited, and insufficient HL levels, respectively (26). In other studies, it has been reported that HL levels in Turkey ranged between 32.5% and 35.4% (27-29).

In studies conducted abroad, HL levels have been reported sufficient (12-14,30). According to a large-scale research conducted to determine HL in Europe by Sorenson et al. (2015), it has been reported that HL levels in some countries such as the Netherlands, Germany, Poland, and Ireland were above average, and while the highest HL levels were found in the Netherlands (72%) and Ireland (60%), the lowest levels were found in Bulgaria (37%) and Spain (42%) (31).

According to a research from our country, it is seen that our HL level, when compared to that of Europe, is below average (23,26-29). This study, which we conducted in a university hospital, reached different results compared to the studies conducted country-wide since our results showed that 95.9% considered vaccines necessary and HL levels were sufficient.

In this study, it was seen that the higher the education status of the mothers was, the higher their HL levels was. HL levels of illiterate mothers were detected the lowest. In studies conducted, it has been determined that as the mothers' education level increased, so did their HL levels (18,28,29,32,33). However, in the literature, there are studies detecting low HL levels in individuals with high education levels(12,13,34) or studies showing no significant relation between education level and HL level (14,23,28). The fact that education affects the level of health literacy is an important result. Education plays a vital role in this positive result since it develops learning skills and eases comprehension, in general.

In this study, mothers with bad income were found to have low HL levels. In studies conducted on the matter, along with

studies suggesting that HL levels also increase with the increase in income levels (35-37), there is also a study that has found low HL despite high income levels (38). In addition, a significant difference could not have been found between monthly income of families and their HL levels (12,13,23,28,30,35,36). Along with various results in the literature, it is possible to state that HL levels are positively affected by the increase in public welfare and the ease in reaching healthcare services in parallel to the income status.

In this research, HL levels of mothers who were employed and had social security were found higher. Being employed means that the mothers have social security. In studies by Şen Uğur (2016) (37), Özdemir (2018) (39), and Öncü et al. (2018) (40), HL levels of the individuals who were employed and had social security were determined higher. In other studies, it has been indicated that HL levels did not change according to employment status (35,39). Along with different results in the literature, it can be said that an increase in HL levels is an expected result of high socioeconomic conditions.

In our study, HL levels of the mothers who got their children immunized with paid vaccinations were found higher compared to mothers who did not. Moreover, it was also found that the reason for not getting paid vaccinations was significantly related to HL levels, and mothers with insufficient financial opportunities had lower HL levels. Arlı's study (2018) (17) has emphasized that 78.3% of the parents got their children immunized with paid vaccinations, 21.7% did not and the reason for not getting their children immunized with paid vaccinations was that 62.2% did not have information on paid vaccinations and 10.6% did not have the financial opportunity.

Our study pointed out that HL levels decreased with the increase in the number of children. In the study of Ulusoy (2019) (28) a negative relation has been reported between the number of children and HL levels, similar to our study. Brandstetter et al. (2020) have determined that HL level was lower in mothers with first child and low education level (30).

Conclusion

This research concluded that a majority of the mothers considered vaccinations necessary and had a sufficient HL level. Moreover, mothers' HL levels were found to have been affected by their education level, income status, their employment status, their social security status, the number of children, the condition of getting paid vaccinations, the reasons of not getting paid vaccinations.

The importance of the notion of HL is getting more prominent day by day. All healthcare professionals that have a vital role in the protection, continuation and improvement of health and also nurses who actively execute their role as

health instructors and consultants, independent of their duties, inform parents on the importance of childhood vaccines and continue educating parents on the matter, which, in turn, provide more conscious and efficient healthcare applications and serve as a significant tool in improving public health. In addition, it is recommended to conduct larger scale studies with a wider population and sample.

Limitations of the Research

Since this study was conducted in a hospital, it gives information related to a small sample group. Therefore, it is not possible to generalize the study results to the whole public. Hence, larger-scale studies are needed at the nation level.

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Informed Consent: Patient consent was obtained.

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