Research Article / Araştırma Makalesi

Health Literacy Levels of Individuals not Vaccinated for COVID-19

COVID-19 Aşısı Yaptırmayan Bireylerin Sağlık Okuryazarlığı Düzeyi

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ABSTRACT

Aim: Inadequate health literacy is a risk factor for preventive health services such as vaccination. This study was conducted to determine the health literacy levels of individuals who did not receive the COVID-19 vaccine and determine the relationship between vaccine refusal and health literacy.

Material and Method: This descriptive and cross-sectional study was conducted on 366 individuals between November 2021 and March 2022. The questionnaire form consisting of the participants' socio-demographic characteristics, COVID-19 vaccination status, and the Turkey Health Literacy Scale-32 was applied in face-to-face interviews.

Results: Of the participants, 31.1% had inadequate, 26.8% limited/problematic, 24.9% adequate, and 17.2% excellent health literacy levels. The health literacy of evaluating health-relevant information to health was the lowest adequate health literacy with 39.1%. The health literacy of applying health-relevant information was the highest adequate health literacy with 51.9%. Adequate disease prevention/health promotion health literacy level was higher in those who always followed the coronavirus process and paid attention to social distance and hand washing and was higher than inadequate disease prevention/health promotion level (p<0.05).

Conclusion: The level of adequate health literacy of the participants was low. Those with adequate levels of health treatment and service health literacy sub-dimension were higher than those with adequate health literacy sub-dimension of disease prevention and health promotion. Improving health literacy in individuals who have problems using preventive health services such as vaccination is essential for their own and public health.

Key Words: COVID-19, Vaccine, Health Literacy.

ÖZ

Amaç: Yetersiz sağlık okuryazarlığı, aşılama gibi koruyucu sağlık hizmetleri için bir risk faktörüdür. Bu çalışma, COVID-19 aşısı yaptırmayan bireylerin sağlık okuryazarlığı düzeylerini belirlemek ve aşı reddi ile sağlık okuryazarlığı arasındaki ilişkiyi saptamak amacıyla yapılmıştır.

Gereç ve Yöntem: Tanımlayıcı ve kesitsel nitelikteki bu çalışma Kasım 2021 ile Mart 2022 tarihleri arasında 366 kişi üzerinde gerçekleştirilmiştir. Veriler katılımcıların sosyodemografik özellikleri ve COVID-19 aşılamalarına dair sorulardan oluşan anket formu ve Türkiye Sağlık Okuryazarlığı Ölçeği- 32 kullanılarak yüz yüze görüşme tekniği ile toplanmıştır.

Bulgular: Katılımcıların %31,1'i yetersiz, %26,8'i sınırlı/sorunlu, %24,9'u yeterli ve %17,2'si mükemmel sağlık okuryazarlığı düzeyindedir. Sağlıkla ilgili bilgiyi değerlendirme sağlık okuryazarlığı %39,1 ile en düşük yeterli sağlık okuryazarlığı ve sağlıkla ilgili bilgiyi kullanma sağlık okuryazarlığı %51,9 ile de en yüksek yeterli sağlık okuryazarlığıdır. Coronavirüs sürecini her zaman takip edenlerde, her zaman sosyal mesafeye uyanlarda ve ellerini yıkayanlarda hastalıktan korunma yeterli sağlık okuryazarlık düzeyinde olanlar, hastalıktan korunma yetersiz sağlık okuryazarlık düzeyinde olanlara göre daha yüksektir (p<0.05).

Sonuç: Katılımcıların, yeterli sağlık okuryazarlık düzeyi düşüktür. Tedavi ve hizmet sağlık okuryazarlık alt boyutu yeterli düzeyde olanlar, hastalıklardan korunma ve sağlığın geliştirilmesi sağlık okuryazarlık alt boyutu yeterli düzeyde olanlardan daha yüksektir. Aşılama gibi koruyucu sağlık hizmetleri kullanımında sorun yaşayan bireylerinde sağlık okuryazarlığının geliştirilmesi hem kendilerinin hem de toplum sağlığı açısından önemlidir.

Anahtar Kelimeler: COVID-19, Aşı, Sağlık Okuryazarlığı.

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Introduction

Public health science aims to protect individuals from getting sick, restore health to ill individuals despite protection, and enable individuals who cannot be treated to live independently without being dependent on others. Thanks to these goals, it aims to increase the health level of the individual and the society (1). Immunization services, included in preventive health services for individuals, have an individual effect and a social effect with widespread vaccination practices (2).

Although developing COVID-19 vaccines is a crucial step, vaccine hesitation has become another problem in ending the pandemic. The World Health Organization (WHO) defined vaccine hesitancy as one of the ten problems threatening global health in 2019 (3). According to a systematic review study examining the acceptance rates of COVID-19 vaccines, it was determined that there was great variability in COVID-19 vaccine acceptance rates in different countries and regions. Ecuador (97.0%), Malaysia (94.3%), Indonesia (93.3%), and China (91.3%) had the highest COVID-19 vaccine acceptance rates. Kuwait (23.6%), Jordan (28.4%), Italy (53.7), Russia (54.9%), Poland (56.3%), America (56.9%), and France (58.9%) had the lowest COVID-19 vaccine acceptance rates (4). In a study conducted in Turkey, the rate of COVID-19 vaccine acceptance was 66.0%, the rate of those who were not sure about getting vaccinated was 31.0%, and the rate of those who refused to be vaccinated was 3.0% (5).

Health literacy is the extent to which people can access, understand, appraise, and apply health-related information through all communication channels. Adequate health literacy enables the individual to make informed decisions about health care services, prevention of diseases, and health promotion (6). It has been determined that individuals with inadequate health literacy levels have problems using preventive health services such as screening and vaccination and lack information about preventive health services (7). A study in Norway found that parents with high levels of health literacy were more active participants in the decision-making process regarding their children's vaccinations (8). A study conducted in India found that when adjusting for age and socioeconomic variables, mothers with a mid or high level of functional health literacy were significantly more likely than mothers with a low level of functional health literacy to complete child vaccinations (9). In a study in the Netherlands, health literacy is associated with parents' preferences for rotavirus vaccination (10). Wilson et al. found that low functional health literacy was associated with low knowledge about vaccinations (11).

In addition to the negative impact of the COVID-19 pandemic on society, rapidly developed vaccines have also caused some problems in vaccination. Based on these problems, the lack of correct sources of information about vaccines, the fact that people think they have insufficient information, and the view of society on the health system and the vaccines developed have been effective. This situation affects the opinions of individuals about the vaccination of both themselves and their families. Therefore, there is a need for scientific research into the related issues between vaccine rejection and health literacy.

This study aimed to determine the health literacy levels of individuals who did not receive the COVID-19 vaccine in Adıyaman during the COVID-19 pandemic period to determine the relationship between vaccine refusal and health literacy and the opinions of individuals who did not receive the vaccine. This study is thought to contribute to the literature on these issues.

Material and Methods

Study Design and Setting

This cross-sectional and descriptive study was conducted between November 15, 2021, and March 14, 2022, in Turkey (Adıyaman city). This study was performed in family health centers with individuals not vaccinated against COVID-19. Individuals aged 18 and over, literate, not having any mental/cognitive problems, and individuals who did not receive the COVID-19 vaccine at the time of the study were included.

Sample Size and Sampling Method

The study's sample size was calculated as 357 people (aimed to reach 400 people due to possible problems.) with a 95% confidence interval, alpha=0.05, power Beta=0.80, and effect size d=0.10. The study was completed with 366 people who did not have the COVID-19 vaccine and agreed to participate.

Study Instruments

In obtaining the data in the study, the Turkish Health Literacy Scale (TSOY-32), created with a five-point Likert scale, socio-demographic data and COVID-19 vaccine-related questions were used.

The European Health Literacy Turkish Scale (HLS-TR) scale was translated into Turkish using the framework developed in "The European Health Literacy Survey" (HLS-EU). The TSOY-32 scale was also developed from the HLS-TR scale. Okyay et al. (2016) conducted the validity and reliability study in our country. The general internal consistency (Cronbach's Alpha) coefficient of the scale was determined as 0.927. In our study, the scale's internal consistency was 0.95. HLS-TR scale consists of a 12-cell matrix (3x4) composed of three dimensions (areas) and four information processing processes (stages) and a questionnaire consisting of 47 questions. The TSOY-32 scale consists of an 8-cell matrix (2x4) composed of two dimensions (areas) and four information processing processes (stages). The two dimensions are treatment and service and disease prevention/health promotion. There are four information processing processes: accessing/obtaining health-relevant information, understanding health-relevant information, appraising/evaluating health-relevant information, and applying/using health-relevant information. Each of the 32 questions is scored between 1 and 4, as very difficult (1 point) – difficult (2 points) – easy (3 points) – or very easy (4 points). As a result of scoring calculated with a unique formula, participants score between 0 (lowest score) and 50 (highest score). According to the score received, 0-25 points range is defined as "inadequate," (>25-33) points range as "limited/problematic," (>33-42) points range as "adequate," and (>42-50) points range as "excellent" health literacy (12). Health literacy level during the assessment is reclassified as adequate (excellent/adequate) and inadequate (limited/inadequate).

Data Analysis

IBM Statistical Package for Social Sciences (SPSS) statistical software was used for data entry and analysis. Mean and standard deviation were used in continuous data, and the chi-square test was used to compare groups in categorical data. P value <0.05 was considered statistically significant.

Ethics

For the study, approval from the Scientific Research Evaluation Commission of the Ministry of Health and the ethics committee approval (Decision No: 2021/583 on 22.09.2021) from the Scientific Research and Publication Ethics Committee of Erciyes University was obtained. Verbal consent was obtained by explaining the purpose of the study to the individuals participating in the study.

Results

Of the participants, 58.7% were female, 60.4% were married, and the mean age was 32.78±12.18 years. Of the participants, 37.4% were high school graduates and 34.4% were housewives. While 13.1% of the participants had a chronic disease, the most common chronic disease among those with chronic diseases was diabetes, with 25.0%.

Of the participants, 31.1% had inadequate, 26.8% limited, 24.9% adequate, and 17.2% excellent health literacy levels. The average general health literacy (HL) was 29.61±12.68. The adequate treatment and service health literacy rate was 47.0%, and the mean health literacy rate was 30.95±12.77. The rate of adequate prevention diseases/health promotion health literacy was 42.3%, and the mean health literacy rate was 28.27±13.76 (Table 1).

While the level of adequate health literacy decreased as the age increased, adequate health literacy increased as the education level increased, and the differences were statistically significant. While 43.3% of women had an adequate health literacy level, this rate was 40.4% for men. Although the level of adequate health literacy was higher in those who were single/divorced (46.9%) according to marital status and who were educators (68.8%) by profession, the differences were not statistically significant (Table 2).

Although the differences in fever and respiratory distress symptoms were statistically significant, they were higher in those with adequate prevention diseases/health promotion health literacy levels for all three symptoms. Those with adequate prevention diseases/health promotion health literacy level of 20.0% and those with inadequate prevention diseases/health promotion health literacy level of 9.0% always followed the Coronavirus process ($p<0.05$). The differences between wearing masks and washing hands were statistically significant (Table 3).

Among the reasons for not vaccinating against COVID-19, the top three included that the vaccine was not safe (49.5%), that the vaccine was not protective (43.7%), and that vaccines contained harmful substances (18.3%). Other reasons (9.3%) were side effects, fear of the vaccine, and vaccine instability (Table 4).

Discussion

Of the participants, 42.1% had sufficient health literacy. According to the "Turkey Health Literacy Survey" results conducted on the general population (N = 4924) in 2014, 35.4% of the participants had adequate health literacy levels (13). According to the results of the "Turkey Health Literacy Level and Related Factors Survey," another study conducted on the general population (N = 6228) in 2017, 31.1% of the participants had adequate health literacy levels (14). In studies performed with teachers in Turkey, 50.4% in 2018 (N = 875) and 48.0% in 2019 (N = 306) had adequate health literacy (15, 16). In a study conducted with university students in Turkey in 2018 (N=1003), 62.8% had adequate health literacy (17). In studies conducted with teachers in Turkey in 2021 (N = 381), 56.4% had adequate health literacy (18). All the studies given above, including ours, were conducted using either HLS-EU or TSOY-32 (adapted from HLS-EU to Turkish) scales. Regarding adequate health literacy level, our study results were higher than those of the studies conducted on the general population. The fact that our study results were higher than the general population in terms of health literacy level may be due to the importance of health literacy. In addition, the high level of education in our study group was considered another factor.

Regarding adequate health literacy level, our study results were lower than those conducted in special groups. In national and international studies, it has been determined that individuals with inadequate health literacy have a lack of information about preventive health services and have problems using these services (13, 19, 20). The reason why our study results were lower than the results of the study conducted in special groups might be due to the higher level of inadequate health literacy in individuals who had problems using preventive health services such as vaccination.

In our study, 45.9% of individuals under the age of 30, 42.9% of individuals between the ages of 30- 49, and 18.2% of individuals aged 50 and over had adequate health literacy ($p<0.05$). As the age increased, the level of adequate health literacy decreased. According to the "Turkey Health Literacy Level and Related Factors Survey" results, 42.8% of individuals between the ages of 18 and 24 and 9.6% of individuals aged 65 and over had adequate health literacy. As the age increased, the level of adequate health literacy decreased (14). According to the results of the "Reliability and Validity Study of the Turkish Health Literacy Scales" conducted in 2016, although the level of adequate health literacy decreased as the age increased, 40.3% of individuals aged 15-24, 32.8% of individuals aged 45-54 and 9.5% of individuals aged 65-83 had adequate health literacy (12). Similarly, in national and international studies, the level of adequate health literacy decreases as age increases (13, 21). As in other studies, as in our study, adequate health literacy levels decreased as age increased, and advanced age is considered a risk factor for inadequate health literacy. It would be beneficial to prioritize elderly individuals in studies aimed at improving health literacy, both because of the majority of deaths that occurred in elderly individuals during the COVID-19 pandemic period and the increase in the elderly population.

In evaluating health literacy according to its sub-dimensions in information processing processes, it is seen that the highest level of inadequate health literacy is evaluating information-relevant health with 60.9%, and the lowest level of inadequate health literacy is using/applying information-relevant health with 48.1%. At the same time, the level of inadequate health literacy in accessing information relevant to health is 51.4%, and the level of health literacy in understanding information relevant to health is 50.0%. While 20.0% of those with adequate prevention diseases/health promotion health literacy levels always follow the coronavirus process, this rate is 9.0% for those with inadequate prevention diseases/health promotion health literacy levels ($p<0.05$). Fever, cough, and respiratory distress were the most frequently expressed coronavirus disease symptoms. In all three symptoms, adequate disease prevention/health improvement health literacy level was higher than inadequate disease prevention/health improvement level. The differences in fever and respiratory distress symptoms were statistically significant ($p<0.05$). While 36.8% of those with adequate disease prevention/health promotion health literacy levels always paid attention to social distance during the coronavirus process, this rate was 25.6% for those with inadequate disease prevention/health improvement health literacy level ($p<0.05$). While 53.5% of those with adequate disease prevention/health promotion health literacy levels always washed their hands during the coronavirus process, this rate was 41.2% for those with disease prevention/health improvement health literacy levels ($p<0.05$). Similarly, in those who always wore masks during the coronavirus process, adequate disease prevention/health improvement health literacy level was higher than inadequate disease prevention/health improvement health literacy level. However, the difference was not statistically significant. It can be said that participants did not have any problems accessing health-relevant information by always following the coronavirus process, understanding health-relevant information by knowing the most common symptoms of

Table 1. Distribution of general and sub-dimensions health literacy indices of participants.

Health Literacy Indices (n=366)		Inadequate		Problematic		Sufficient		Excellent		Average Health Literacy Score
		No	%	No	%	No	%	No	%	
General Health Literacy (HL)		114	31.1	98	26.8	91	24.9	63	17.2	29.61±12.68
Areas	Health treatment and service Health Literacy	106	29.0	88	24.0	98	26.8	74	20.2	30.95±12.77
	Disease Prevention and Health Promotion Health Literacy	132	36.1	79	21.6	94	25.7	61	16.6	28.27±13.76
Information Processing Stages	Access/Obtain Information Relevant to Health	122	33.4	66	18.0	104	28.4	74	20.2	30.31±13.74
	Understand Information Relevant to Health	130	35.5	53	14.5	115	31.4	68	18.6	30.31±13.55
	Appraise/Evaluate Information Relevant to Health	149	40.7	74	20.2	90	24.6	53	14.5	27.80±13.44
		117	32.0	59	16.1	136	37.1	54	14.8	30.02±13.00

Table 2. Adequate general health literacy levels according to various characteristics of participants.

Characteristics (n=366)	Total		Adequate HL (n=154)		X^2	p
	No	%	No	%		
Age group (years)						
30 and under	172	47.0	79	45.9	8.819	0.012
30 – 49	161	44.0	69	42.9		
50 and over	33	9.0	6	28.2		
Gender						
Female	215	58.7	93	43.3	0.297	0.586
Male	151	51.3	61	40.4		
Educational Status						
Illiterate/literate without diploma	30	8.2	7	23.3	11.472	0.009
Primary education (primary and secondary school)	74	20.2	24	32.4		
High School	137	37.4	59	43.1		
University / MA and PhD	125	34.2	64	51.2		
Marital status						
Married	221	60.4	86	38.9	2.289	0.130
Single/divorced	145	39.6	68	46.9		
Occupation						
Educator (Teacher-Academicians)	16	4.4	11	68.8	6.717	0.348
Small Business	18	4.9	8	44.4		
Self-employment	37	10.1	13	35.1		
Worker	42	11.5	17	40.5		
Students	69	18.9	31	44.9		
Home worker	126	34.4	48	38.1		
Other (Retired, civil servant)	58	15.8	26	44.8		

Chronic disease						
Yes	48	13.1	17	35.4	1.005	0.316
No	318	86.9	137	43.1		
General health status						
Very good	54	14.8	30	55.6	9.581	0.022
Good	196	53.6	87	44.4		
Moderate	101	27.6	33	32.7		
Bad	15	4.1	4	26.7		

The row percentage was given.

Table 3. Prevention diseases/health promotion health literacy levels according to various characteristics of participants.

Characteristics (n=366)	Total		Inadequate HL (n=211)		Adequate HL (n=155)		X^2	p
	No	%	No	%	No	%		
The most common symptom of COVID-19 **								
Fever	290	79.2	158	74.9	132	85.2	5.739	0.017
Cough	319	87.2	181	85.8	138	89.0	0.843	0.358
Respiratory distress	286	78.1	152	72.0	134	86.5	10.869	0.001
Frequency to follow the COVID-19 process.								
Always	50	13.6	19	9.0	31	20.0	30.225	0.000
Source to follow the COVID-19 process */**								
TV/Radio	226	61.7	131	62.1	95	61.3	0.024	0.877
Internet/social media	182	49.7	97	46.0	85	54.8	2.810	0.094
Complying with COVID-19 bans								
Yes	304	83.1	178	84.4	126	81.4	0.599	0.439
COVID-19 positive in the acquaintances								
Yes	326	89.1	180	85.3	146	94.2	7.247	0.007
COVID-19 death in the COVID-19 positive in the acquaintances								
Yes	135	36.9	88	41.7	47	30.3	4.974	0.026
Wearing a mask during the coronavirus								
Always	123	33.6	61	28.9	62	40.0	6.044	0.196
Social distancing compliance during the coronavirus								
Always	111	30.3	54	25.6	57	36.8	10.179	0.038
Handwashing during the coronavirus								
Always	170	46.4	87	41.2	83	53.5	11.049	0.026
Would you vaccinate if there are restrictions on those who do not get vaccinated?								
Yes	205	56.0	114	54.0	91	58.7	0.795	0.373
Do you think that those who do not get vaccinated cause the pandemic to continue?								
Yes	82	22.4	54	25.6	28	18.1	2.913	0.088
How does coronavirus end?								
Never-ending	171	46.7	91	43.1	80	51.6	2.584	0.108

* The two most common answers are given. **Multiple options are marked.

coronavirus, using health-relevant information by always wearing a mask, paying attention to social distance, and providing hand hygiene. The participants having problems in evaluating health relevant-information, which was the highest level of inadequate health literacy, may also have caused them not to have the COVID-19 vaccine.

Table 4. Reasons for participants not vaccinated for COVID-19.

Reasons (n=366) *	n	%
Vaccine allergy	15	4.1
Better to be sick than to be vaccinated	15	4.1
Vaccine causes infertility	24	6.6
As a foreign country vaccine	46	12.6
Vaccines contain harmful substances	67	18.3
The vaccine is not protective	160	43.7
The vaccine is not safe	181	49.5
Others (Side effects, fear of vaccine, vaccine instability, etc.)	34	9.3

* Multiple options are marked.

In a study evaluating the approach of news sites to COVID-19 vaccines, it has been determined that they reflect their own broadcasting policies on their news content, and therefore, the effect of expert opinion, which increases the reliability of the news, decreases. It was concluded that this situation increased the effect of misinformation and conspiracy theories (22). An analogous situation is experienced on the internet and social media platforms. Especially on social media platforms, misinformation about the COVID-19 outbreak and anti-vaccination is increasing (23). For example, some groups post on social media, such as "There is no virus," "A vaccine will control us with a microchip," and "I do not trust the vaccine" (24). With the COVID-19 pandemic, the concept of infodemia has been brought to the fore again (25). The term "infodemia" is defined by the WHO as "too much information, including false or misleading information in digital and physical environments during a disease outbreak (26). In our study, in the evaluation of the TSOY-32 scale based on questions, the question with the second-highest frequency of those who answered very difficult/difficult was "Deciding whether the information recommended to be healthier in sources such as the internet, newspaper, television, and radio is reliable or not." The rate of those who gave very difficult/difficult answers to this question is 36.0%. The place where the coronavirus process was frequently followed was Television/Radio (61.7%) and internet/social media with 49.7%.

Among the reasons for not vaccinating against COVID-19, not finding the vaccines safe (49.5%), not considering them to be protective (43.7%), and containing harmful substances in vaccines (18.3%) were the most common reasons. Intense and unreliable information may affect individuals to make the right health decisions. This effect, which is also seen in the reasons for not getting the COVID-19 vaccine, may have caused individuals not to have the COVID-19 vaccine. Similar results were found in the literature (27-30).

Conclusion

It is known that global events affect people deeply, but it is not yet predictable how the COVID-19 pandemic will affect the opponents of vaccines. However, ensuring community immunity is critical in preventing epidemics. In our study, the level of adequate health literacy of the participants was found to be low. Developing health literacy for preventive health practices such as vaccination is crucial. The right source should be used to develop health literacy and solve individual and social health problems. Health professionals and health administrators should reach undecided and vaccine-rejection individuals and provide information in a way that responds well to misinformation and disbelief about the safety and efficacy of the vaccine. It is thought that this study will be a resource that researchers and healthcare professionals can refer to on vaccine rejection and health literacy and will contribute to the literature on these issues.

Study Limitations

While one of the strengths of our study is that it is one of the rare studies examining the COVID-19 vaccine and health literacy in our country, one of the weaknesses of our study is that it has been done regionally and in a single center.

Ethics Committee Approval: Approval for this study was obtained from the Scientific Research and Publication Ethics Committee of Erciyes University was obtained (Decision No: 2021/583 on 20.09.2021).

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REFERENCES

1. Öztürk Y. Public Health. Goals, aims and principles of public health. Erciyes University Press, Kayseri, Turkey; 2009.
2. Öztek Z. Basic Health Services 1978-2018. Association of public health specialists. Edirne, Turkey; 2018
3. World Health Organization (WHO) newsroom and spotlight: Ten threats to global health in 2019. Available from: https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019 Access Date: June 10, 2023
4. Sallam M. COVID-19 Vaccine Hesitancy Worldwide: A Concise Systematic Review of Vaccine Acceptance Rates. Vaccines 2021; 160.
5. Salali GD, Uysal MS. COVID-19 vaccine hesitancy is associated with beliefs on the origin of the novel coronavirus in the UK and Turkey. Psychol Med. 2020; 1-3.
6. Sorensen K, Van den Broucke S, Fullam J, et al. Health literacy and public health: A systematic review and integration of definitions and models. BMC Public Health 2012; 12(80): 1-13.
7. Adams RJ, Appleton SL, Hill CL, et al. Risks associated with low functional health literacy in an Australian population. Med J Aust 2009; 191: 530-534.
8. Austvoll-Dahlgren A, Helseth S. What informs parents' decision-making about childhood vaccinations? J. Adv. Nurs. 2010; 66: 2421-2430.
9. Johri M, Subramanian SV, Sylvestre M, et al. Association between maternal health literacy and child vaccination in India: a cross-sectional study, J. Epidemiol Commun H. 2015;69(9):849-854.
10. Veldwijk J, Heide I. van der, Rademakers J, et al. Preferences for vaccination: does health literacy make a difference? Med Decis Making. 2015, 38(8), 948-958.
11. Wilson FL, Baker LM, Nordstrom CK, Legwand C. Using the teach-back and Orem's self-care deficit nursing theory to increase childhood immunization communication among low-income mothers, Issues Compr Pediatr Nurs. 2008, 31(1), 7–22.
12. Okyay P, Abacıgil F. Turkish Health Literacy Scales Reliability and Validity Study. Ministry of Health Press, Ankara Turkey; 2016.
13. Durusu-Tanrıöver M, Yıldırım HH, Demiray-Ready FN, Çakır B, Akalın HE. Turkey Health Literacy Survey. Sağlık-Sen Press, Ankara, Turkey; 2014.
14. Özkan, S, editors. Turkey Health Literacy Level and Related Factors Survey. 1st ed. Ministry of Health Press, Ankara; 2018.
15. Güner AE, Şahin E, Peksu S, Kaya Şengü S, Güngör M. A study on determination health literacy level and identification of knowledge, manner, behavioral change and educational needs of elementary school teachers. Turkish Journal of Health Literacy 2020;1(1):58-76.
16. Deniz S, Bentli R, Kalkanlı MT, et al. Determination of health literacy levels and related factors of teachers working in Malatya. Sakarya Med J. 2020;10(1):28-36.
17. Malatyalı İ, Biçer EB. Determination of health literacy levels: The case of Sivas Cumhuriyet University. Ankara University Journal of Health Services. 2018;17(2):16-27.

18. Doğan M, Özdemir F. The relationship between health literacy level of pregnant women and COVID-19 knowledge, attitudes and behaviors. Sakarya Med J. 2021;11(3):533-541.
19. Doğan M, Çetinkaya F. The relationship of health literacy level with positive health behaviors in academicians. Journal of Health Sciences 2019; 28:135-141.
20. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: An updated systematic review. Ann Intern Med. 2011;155:97-107.
21. Jovic-Vranes A, Bjegovic-Mikanovic V. Which women patients have better health literacy in Serbia? Patient Education and Counseling. 2012;89;209-212.
22. Topsakal T, Ferik F. Approaches of news sites to Covid-19 vaccines and evaluation of news content. The Journal of Akdeniz University's Faculty of Communication. 2021;35:370-386.
23. Ball P. Anti-vaccine movement could undermine efforts to end coronavirus pandemic, researchers warn. Nature. 2020;581(7808):251.
24. Durmaz N, Hengirmen E. The dramatic increase in anti-vaccine discourses during the COVID-19 pandemic: a social network analysis of Twitter. Hum Vaccin Immunother. 2022;18(1):e2025008.
25. Gölbaşı SD, Metintaş S. COVID-19 Pandemic and infodemia. ESTUDAM Public Health Journal. 2020;5:126-37.
26. Guess AM, Nyhan B, O'Keeffe Z, Reifler J. The sources and correlates of exposure to vaccine-related (mis)information online. Vaccine. 2020;38(49):7799-805.
27. Genç Ç. Information sources, media usage habits and attitudes towards vaccination in the COVID-19 pandemic. Journal of Akdeniz University Faculty of Communication. 2021; 36:178-202.
28. Kinali G, Örgev BK, Örgev C, Topal B, Şahin H. A study on vaccine literacy and hesitance reflected on life in the COVID-19 pandemic, vaccine rejection and anti-vaccine opposition. Eur J Sci Technol. 2022;38:462-472.
29. Mete B, Doğan Mete E, Kanat C, Pehlivan E, Demirhindi H. Factors affecting COVID-19 vaccine hesitancy: An online survey study in Turkey. ESTUDAM Public Health Journal. 2022;7(1):73-82.
30. Harlak H, Elmas P, Eyiol G, Mert S, Öner Ş. The effects of death salience and fear of COVID-19 on COVID-19 vaccine opposition: A Quasi-experimental Study. Nesne Psikoloji Dergisi 2022,10(25),399-417.