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Evaluation of the Relationship Between Health Literacy and the Perspectives of Pregnancy on Covid-19 Vaccines During the Covid-19 Pandemic Period

Perspectives of Pregnancy on Covid-19 Vaccines

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Abstract:

Objective:1The aim of this study was to investigate the number of pregnant women who were exposed to COVID-19 during the COVID-19 pandemic their perspectives on vaccines, their vaccination status, their attitude towards vaccines, and to evaluate the relationship between their approaches and health literacy.

The population of the study, Kastamonu Training and Research Hospital and those who have at least four weeks of pregnancy who apply to İnebolu State Hospital, and covering all other trimester periods (N = 375). May 2022- Between December 2023, socio-demographic characteristics of pregnant women, obstetrics characteristics, vaccination status, attitudes and behaviors towards vaccines Survey Questionnaire in order to determine and determine health literacy levels Turkey Health Literacy Scale-32 (TSOY-32) was used. Analyses SPSS It was made using 22 software. Data Mean±Standard Deviation and percentage distribution and the Chi-square test was used in its analysis. $p < 0.05$ significance level it was considered statistically significant.

Results: The mean age of pregnant women was 28.40±5.61 and the mean gestational week was 28.405.61 22.69±11.47. In the study, 69.1% of pregnant women had COVID-19 disease. caught, 76% received COVID-19 vaccine and 9.3% were during pregnancy He was seen receiving the COVID-19 vaccine. Infecting the family of 68% of pregnant women with the disease pregnancy because they got the COVID-19 vaccine against their will, and 90.7% of them were pregnant He was seen to have given up on getting the COVID-19 vaccine. Pregnant women's TSOY-32 The mean overall index score of the scale was 23.37 ± 8.35. 55.7% of pregnant women It was determined that there was insufficient health literacy level.

Conclusion: As a result of the study, COVID-19 vaccines during the COVID-19 pandemic Health literacy of pregnant women who are determined to show approaches, attitudes and behaviors It was determined that their levels were insufficient. In line with these results, health By supporting the multidisciplinary team approach of doctors and midwives, who are among the professionals, The level of knowledge of pregnant women with low health literacy about COVID-19 vaccines It should be increased.

Keywords: Pregnancy, COVID-19, COVID-19 vaccines, Health literacy.

INTRODUCTION

Infectious diseases that have impacted countries, continents, and even the entire world have led to the emergence of the concept of a pandemic. The pandemic declared by the World Health Organization (WHO) on March 11, 2020, due to the Coronavirus Disease 2019 (COVID-19) is seen as a serious public health issue today. (1) In the fight against the COVID-19 pandemic, early diagnosis can be achieved by using definitive diagnostic methods to minimize the transmission of the infection from infected individuals to healthy ones. This, combined with the support of antiviral drugs and vaccination practices, can help prevent the rapid spread of the virus. For pregnant women of reproductive age who are infected with COVID-19, the decision regarding the use of antiviral drugs for treatment should be made collaboratively by a multidisciplinary team and the patient herself (2). Among the pharmacological agents used in the treatment of viral infections, the antiviral drug Remdesivir is also used for treating pregnant women (3). The Academy of Breastfeeding Medicine supports the continuation of breastfeeding in infected mothers using the antiviral drug Remdesivir (4). Favipiravir, an antiviral drug that strongly inhibits the RNA-dependent RNA polymerase of RNA viruses, has insufficient data regarding its use in pregnant women and is not recommended (5). Another method used in the treatment of COVID-19 is vaccination. Vaccination plays a crucial role in minimizing the risk factors that may arise in pregnant women facing the risk of COVID-19 infection. Vaccinated pregnant women protect themselves from mortality and morbidity, and subsequently protect the fetus from neonatal mortality and morbidity. This aims to significantly reduce maternal and infant mortality, and "The American College of Obstetricians and Gynecologists (ACOG)" recommends vaccination for all women of reproductive age and breastfeeding mothers (6). Among COVID-19 vaccine types, data on the use of the inactivated CoronaVac (Sinovac) vaccine in reproductive-age pregnant women, who are at risk, are insufficient. However, the WHO supports the vaccination of reproductive-age pregnant women with the CoronaVac (Sinovac) vaccine, suggesting that clarifications about the vaccine should be made, the outcomes of vaccination versus non-vaccination should be compared, and this would contribute to increasing the awareness level of pregnant women. The WHO does not support delaying pregnancy in vaccinated reproductive-age women (7). The Pfizer-BioNTech mRNA vaccine has been found to be safe, well-tolerated, and capable of inducing both humoral and cellular immune responses against the SARS-CoV-2 virus in reproductive-age pregnant women during the second and third trimesters, as well as in newborns and breastfeeding women (8). Following vaccination, both humoral and cellular immune responses are transferred through the placenta to the fetus in pregnant women, and through breast milk to newborns in breastfeeding women, providing protective benefits. The Centers for Disease Control and Prevention (CDC) and the American College of Obstetricians and Gynecologists (ACOG) recommend vaccination for women of reproductive age and breastfeeding mothers, and support the continuation of breastfeeding by vaccinated mothers as well as not delaying pregnancy if planned (9). Lastly, the Turkovac vaccine, which falls under the inactivated vaccine category used in our country, has been approved following an emergency use authorization application, making it the first locally produced COVID-19 vaccine in Turkey (10,11). Health literacy plays a crucial role in developing vaccination habits by helping women make informed decisions about their health, adopt positive health behaviors, and effectively utilize health services (12). This not only enables women to make conscious and accurate decisions about their own health but also helps them manage pregnancy, childbirth, and the postpartum period effectively, significantly benefiting fetal, neonatal, and child health (13).

Inadequate health literacy during pregnancy can hinder access to sufficient and quality prenatal care. It is extremely challenging for women to adhere to recommendations from healthcare professionals, such as obstetricians and midwives, and the

likelihood of making informed decisions about their own health and the fetus's health is relatively low (14). Therefore, improving problematic or limited health literacy levels through planned health education provided by a multidisciplinary team approach involving obstetricians and midwives is essential for ensuring a healthy pregnancy. Women with high health literacy levels engage in behaviors that improve the health of themselves, future generations, and the community (15).

MATERIALS AND METHODS

The study was conducted as a cross-sectional research. The study population consisted of pregnant women who visited Kastamonu Training and Research Hospital and İnebolu State Hospital between May 2022 and December 2023, including those in the early stages of pregnancy (as early as four weeks) as well as those in later trimesters. Based on the data from the study assessing the relationship between health literacy and attitudes toward COVID-19 vaccines during the COVID-19 pandemic, the sample size (power analysis) required to achieve a 95% confidence interval and 80% power was calculated to be 330 pregnant women. The study was completed with 375 pregnant women who met the inclusion criteria. Pregnant women who volunteered to participate, had at least four weeks of pregnancy, and were in any trimester and had visited the hospital were included in the study. Pregnant women with gestational age less than four weeks, those with risky pregnancy conditions, those with health problems that impeded communication (e.g., hearing or vision impairments), and those with chronic psychiatric disorders were excluded from the study.

Data Collection Tools

The research data were collected using a Questionnaire Form, which investigated the socio-demographic characteristics of the pregnant women, pregnancy information, vaccination status, attitudes towards vaccines, and their behaviors. Additionally, the Turkey Health Literacy Scale-32 (TSOY-32) was used to determine their level of health literacy.

Questionnaire Form

The research data were collected using a form consisting of a total of 33 questions: eight questions regarding the socio-demographic characteristics of the pregnant women, eight questions concerning obstetric characteristics, and 17 questions related to COVID-19 parameters. The questions were distributed across multiple-choice, closed-ended, and open-ended formats.

Turkey Health Literacy Scale-32 (TSOY-32 Scale)

The TSOY-32 Scale, designed to measure individuals' health information levels, was developed in 2016 through the adaptation of the European Health Literacy Survey (HLS-EU) into Turkish by a team led by Pınar Okyay, Filiz Abacıgil, and Hacer Harlak. This scale has been incorporated into Turkish literature. The validity and reliability of the scale in Turkey were established by Okyay and colleagues (16).

The scale, developed using a 2X4 matrix, consists of eight components divided into two dimensions: treatment and service, and disease prevention/health improvement. It includes four processes: accessing health-related information, understanding health-related information, evaluating health-related information, and using/applying health-related information (17). It comprises 32 items on a five-point Likert scale. Scores from the TSOY-32 Scale are assigned as follows: very easy (4), easy (3), difficult (2), and very difficult (1). The zero score represents the lowest health literacy level, while fifty represents the highest. The Cronbach's Alpha coefficient for the Turkish version of the scale was found to be 0.927 in the validity and reliability study (18).

Data Collection Process

Before starting the study, the necessary permissions were obtained from the Kastamonu Provincial Health Directorate. Participants were first informed about the study by the researchers, and their consent for voluntary participation was obtained. Subsequently, the participants were asked to

complete the Questionnaire Form and the TSOY-32 Scale thoroughly. Data were collected using face-to-face interviews.

Statistical Analysis

The data were analyzed using IBM SPSS 22 software. Descriptive statistics were used to summarize the data on socio-demographic, obstetric, and COVID-19 characteristics of the pregnant women, as well as the scale data, presenting them as percentages and Mean±Standard Deviation (x̄±SD).

The Chi-square test was applied in the data analysis. A 95% confidence interval and a p-value <0.05 were considered statistically significant.

RESULTS

The findings regarding the socio-demographic characteristics of the 375 volunteer pregnant women participating in the study are presented in Table 1. The average age of the pregnant women was determined to be 28.40±5.61 years, and the average gestational age was 22.69±11.47 weeks (Table 1).

Table 1. Socio-Demographic Characteristics of Pregnant Women (n: 375)			
Characteristics		**Mean±SD**	**Min-Max**
Age		28,40±5,61	18-45
		n	**%**
Occupation	**Housewife**	313	83,5
	Freelancer (Worker)	30	8,0
	Public Employee	32	8,5
Employment Status	Employed	64	17,1
	Not Employed	311	82,9
Income Level	4000-6000 TL	141	37,6
	6000-8000 TL	137	36,5
	8000-10,000 TL	63	16,8
	10,000-12,000 TL	21	5,6
	Above 12,000 TL	13	3,5
Income-Expense Balance	Income less than expenses	239	63,7
	Income equal to expenses	135	36,0
	Income more than expenses	1	0,3
Residence Location	Village	113	30,1
	District	198	52,8
	Center	64	17,1
Education Level	Literate	4	1,1
	Primary school graduate	43	11,5
	Middle school graduate	156	41,6
	High school graduate	131	34,9
	Bachelor's degree	40	10,7
	Postgraduate	1	0,3
Social Security	SSK (Social Security)	224	59,7
	Bağ-Kur (Social Security for Self-Employed)	87	23,2
	Green Card	37	9,9
	None	27	7,2
Min: Minimum, Max: Maximum, SD: Standard Deviation			

Table 2 presents findings related to the obstetric characteristics of the pregnant women. The average age of the first pregnancy for the women was 23.98±4.12 years. The average total number of pregnancies was 2.16±1.45; the average total number of births was 0.90±1.19, and the average number of living children was 0.92±1.22. It was observed that the women experienced their first pregnancy either during adolescence (19 years old and younger) or at advanced age (35 years old and older). 79.5% of the women (n=298) reported that they had not had a miscarriage before. When examining previous birth methods, it was found that 44.5% (n=167) had not given birth before. 88.5% of the women (n=332) had no history of chronic illness. The most common chronic condition was thyroid/goiter disease, which was found in 5.6% (n=21) of the women (Table 2).

Table 2. Obstetric characteristics of pregnant women (n: 375)		
Characteristics	**Mean±SD**	**Min-Max**
Your pregnancy week	*22,69±11,47*	5-40
Age at first pregnancy	*23,98±4,12*	15-40
Total number of pregnancies	*2,16±1,45*	1-11
Total number of births	*0,90 ±1,19*	0-10
Number of living children	*0,92±1,22*	0-10
Characteristics	*n*	%
History of miscarriage Yes	77	20,5
No	298	79,5
Previous birth method Normal vaginal delivery	117	31,2
Cesarean delivery	76	20,3
Stillbirth	15	4,0
I have not given birth	167	44,5
History of chronic illness None	332	88,5
Thyroid/Goiter	21	5,6
Platelet disorder	2	0,5
Hypertension	3	0,8
Diabetes	5	1,3
Ulcerative Colitis	3	0,8
Asthma	3	0,8
Gastritis	1	0,3
Celiac Disease	2	0,5
Migraine	1	0,3
Familial Mediterranean Fever	1	0,3
Psoriasis	1	0,3
Min: Minimum, Max: Maximum, SD: Standard Deviation		

Table 3 shows the findings related to the COVID-19 characteristics of the pregnant women. 69.1% (n=259) of the women reported that they had contracted COVID-19, and when asked about the severity of their illness, 34.7% (n=130) indicated that they did not experience it as either mild or severe. 76% (n=285) of the pregnant women had received the COVID-19 vaccine, and among those vaccinated, 68% (n=255) did so to avoid transmitting the disease to their family. On the other hand, 24% (n=90) had not received the vaccine, and among those who did not get vaccinated, 22.7% (n=85) were afraid of the vaccine's side effects. Most of the vaccinated women, 90.7% (n=340), had not received the vaccine during pregnancy, and 82.7% (n=310) of those who did not get vaccinated did so because they were pregnant. Conversely, 9.3% (n=35) received their vaccines during pregnancy, and among those who got vaccinated during pregnancy, 6.7% (n=25) did so to ease their pregnancy process. 52% (n=195)

of the pregnant women had received two doses of the vaccine, 58.7% (n=220) preferred the BioNTech vaccine, and 43.2% (n=162) indicated that their next vaccine preference would also be BioNTech. Some pregnant women received multiple and different types of vaccines. When asked about side effects after vaccination, 41.1% (n=154) reported no side effects. 64.3% (n=241) of the women felt they did not have enough information about the vaccine, 80% (n=300) recommended the vaccine to others, and 79.5% (n=298) did not closely follow developments related to the COVID-19 vaccine (Table 3).

Table 3. COVID-19 Characteristics of Pregnant Women			
Characteristics		**n**	**%**
COVID-19 infection status	Yes	259	69,1
	No	116	30,9
Condition of illness in those who contracted COVID-19	*I had a very mild case*	*51*	13,6
	It was neither mild nor severe	130	34,7
	Typeface must be same all tables	78	20,8
COVID-19 vaccination status	Yes	285	76,0
	No	90	24,0
If yes, reason for getting vaccinated	*I believe that the vaccine protected me from the illness*	221	58,9
	I trust the vaccine	*168*	44,8
	I do not want to spread it to my family	*255*	68,0
	My workplace requires me to get vaccinated	*29*	7,7
If no, reason for not getting vaccinated	*I do not believe the vaccine is protective*	41	10,9
	I think the vaccine will harm me	81	21,6
	I am afraid of the vaccine's side effects	85	22,7
	I am against vaccines	12	3,2
COVID-19 vaccination status during pregnancy	Yes	35	9,3
	No	340	90,7
If yes, reason for getting vaccinated	I got vaccinated to protect my baby	19	5,1
	I got vaccinated to make the pregnancy process more comfortable	25	6,7
	I believe the vaccine is beneficial	15	4,0
	My doctor recommended that I get vaccinated	24	6,4
If no, reason for not getting vaccinated	I don't want it because it might harm my baby	245	65,3
	I decided not to get vaccinated because I am pregnant	310	82,7
	My time to get vaccinated hasn't come yet	16	4,3
	I believe the vaccine will harm my body	186	49,6

Table 3. COVID-19 Characteristics of Pregnant Women *(Devamı)*			
Characteristics		**n**	**%**
Number of COVID-19 vaccine doses received	1	29	7,7
	2	195	52,0
	3	53	14,1
	4	8	2,1
Type of COVID-19 vaccine received	Sinovac	82	21,9
	BioNTech	220	58,7
	Turkovac	3	0,8
Next vaccine preference	Sinovac	31	8,3
	BioNTech	162	43,2
	Turkovac	92	24,5
Experience of side effects after vaccination	Yes	131	34,9
	No	154	41,1
Level of knowledge about vaccines	Yes	134	35,7
	No	241	64,3
Recommending the vaccine to others	Yes	300	80,0
	No	75	20,0
Following developments in COVID-19 vaccines	Yes	77	20,5
	No	298	79,5

Table 4 shows the findings related to the health literacy levels of pregnant women. The average general index score determined using the TSOY-32 scale for the included pregnant women was calculated as 23.37±8.35. When the health literacy levels of the 375 volunteer pregnant women participating in the study were assessed, it was found that 55.7% (n=209) had an inadequate health literacy level with a score range of 0-25, 31.2% (n=117) had a problematic-limited health literacy level with a score range of 25-33, 12% (n=45) had a sufficient health literacy level with a score range of 33-42, and 1.1% (n=4) had an excellent health literacy level with a score range of 42-50 (Table 4).

Table 4. Distribution of pregnant women in the research group according to their health literacy levels (n: 375)		
Characteristics	**Mean±SD**	**Min-Max**
Overall index score	23,37 ± 8,35	0-50
Characteristics	**n**	**%**
Insufficient health literacy	209	55,7
Problematic-limited health literacy	117	31,2
Adequate health literacy	45	12
Excellent health literacy	4	1,1
Min: Minimum, Max: Maximum, SD: Standard Deviation		

Table 5 shows the effect of pregnant women's COVID-19 vaccination status on their socio-demographic characteristics. A statistically significant difference was detected between pregnant women's COVID-19 vaccination status and their employment status (p <0.05). A statistically significant difference was detected between pregnant women's COVID-19 vaccination status and their social security (p <0,05). The significant difference is due to the None group, which does not have social security.

Table 5. The effect of pregnant women's COVID-19 vaccination status on their socio-demographic characteristics							
Variable	**Working Status**						
	I am working I am not working Total						**p**
COVID-19 vaccination status (n=375)							
Yes	n	56	229	285			
	%	14,9	61,1	76,0		**0,018**	
No	n	8	82	90			
	%	2,1	21,9	24,0			
Total	n	64	311	375			
	%	17,1	82,9	100,0			
Variable	**Social security**						
		SSK (Social Security)	**Bağ-Kur (Social Security for Self-Employed)**	**Green card**	**None**	**Total**	**p**
COVID-19 vaccination status (n=375)							
Yes	n	181	63	26	15	285	**0,016**
	%	48,3	16,8	6,9	4,0	76,0	
No	n	43	24	11	12	90	
	%	11,5	6,4	2,9	3,2	24,0	
Total	n	224	87	37	27	75	
	%	59,7	23,2	9,9	7,2	100,0	
*p≤0,05 It was considered statistically significant. *Chi-square test was used.							

Table 6 shows the impact of COVID-19 characteristics of pregnant women on their health literacy levels. There was no statistically significant difference between the pregnant women's COVID-19 disease status and their health literacy levels (p > 0.05). There was no statistically significant difference between the disease process status and health literacy levels of pregnant women with COVID-19 (p > 0.05). A statistically significant difference was detected between the symptom of sore throat, which is among the symptoms experienced by pregnant women with COVID-19 during the disease process, and their health literacy levels (p <0.05). The symptom of sore throat was more common in pregnant women with insufficient health literacy level, at a rate of 46.7% (n=121). A statistically significant difference was detected between pregnant women's COVID-19 vaccination status and their health literacy levels (p <0.05). A statistically significant difference was detected between the workplace's willingness to be vaccinated, which was among the reasons for pregnant women vaccinated against COVID-19, and their health literacy levels (p <0.05). A statistically significant difference was detected between the thought that the vaccine would harm oneself, which was among the reasons for not being vaccinated for pregnant women who had not received the COVID-19 vaccine, and their health literacy levels (p <0.05). A statistically significant difference was detected between pregnant women's COVID-19 vaccination during pregnancy and their health literacy levels (p <0.05). There was no statistically significant difference between the reasons why pregnant women received the COVID-19 vaccine during pregnancy, such as protecting their babies, having a comfortable pregnancy, thinking the vaccine

is beneficial, and the doctor's recommendation to be vaccinated, and their health literacy levels (p > 0.05). A statistically significant difference was detected between pregnant women's health literacy levels and the reasons for not getting the COVID-19 vaccine during pregnancy: thinking that it would harm their baby, not being vaccinated for time, and thinking that the vaccine would harm the body (p <0.05). There was no statistically significant difference between the status of giving up vaccination due to pregnancy, which is among the reasons why pregnant women did not receive the COVID-19 vaccine during pregnancy, and their health literacy levels (p > 0.05). There was no statistically significant

difference between the number of COVID-19 vaccine doses received by pregnant women and their health literacy levels (p > 0.05). A statistically significant difference was detected between pregnant women's having sufficient knowledge about vaccination and their health literacy levels (p <0.05). There was no statistically significant difference between pregnant women's recommendation of vaccination to others and their health literacy levels (p > 0.05). A statistically significant difference was detected between pregnant women's ability to follow developments regarding the COVID-19 vaccine and their health literacy levels (p <0.05).

Table 6. The impact of COVID-19 characteristics of pregnant women on their health literacy levels						
Variable		Insufficient	Problematic-Limited	Satisfactory/ Excellent	Total	p
Status of contracting COVID-19 disease (n=375)						
Yes	n	139	81	39	259	0,198
	%	37,1	21,6	10,4	69,1	
No	n	70	36	10	116	
	%	18,7	9,6	2,7	30,9	
Disease process status in those infected with COVID-19 (n=259)						
I survived the disease very mildly.	n	30	13	8	51	0,559
	%	11,6	5,0	3,1	19,7	
My illness was neither mild nor severe.	n	64	47	19	130	
	%	24,7	18,1	7,3	50,2	
I overcame the disease very seriously.	n	45	21	12		
	%	17,4	8,1	4,6	78	
Symptoms experienced by people with COVID-19 during the disease process						
Sore throat						
Yes	n	121	64	27	212	**0,028**
	%	46,7	24,7	10,4	81,9	
No	n	18	17	12	47	
	%	6,9	6,6	4,6	18,1	
COVID-19 vaccination status (n=375)						
Yes	n	147	96	42	285	**0,014**
	%	22,8	13,9	11,2	76,0	
No	n	62	21	7	90	
	%	16,5	5,6	1,9	24,0	
If your answer is yes, the reason for vaccination (n=285)						
My workplace requires me to get vaccinated						

Table 6. The impact of COVID-19 characteristics of pregnant women on their health literacy levels (Continue)						
Variable		Insufficient	Problematic-Limited	Satisfactory/ Excellent	Total	p
Yes	n	1	10	18	29	**<0,001**
	%	0,4	3,5	6,3	10,2	
No	n	146	86	24	256	
	%	51,2	30,2	8,4	89,8	
If your answer is no, the reason for not being vaccinated (n=90)						
I think the vaccine will harm myself						
Yes	n	59	19	3	81	**<0,001**
	%	65,6	21,1	3,3	90,0	
No	n	3	2	4	9	
	%	3,3	2,2	4,4	10,0	
Status of receiving COVID-19 vaccination during pregnancy (n=375)						
Yes	n	15	11	9	35	**0,045**
	%	4,0	2,9	2,4	9,3	
No	n	194	106	40	340	
	%	51,7	28,3	10,7	90,7	
If your answer is yes, reason for vaccination (n=35)						
I was vaccinated to protect my baby						
Yes	n	9	6	4	19	0,907
	%	4,0	2,9	2,4	54,3	
No	n	6	5	5	16	
	%	17,1	14,3	14,3	45,7	
I was vaccinated to have a comfortable pregnancy.						
Yes	n	11	8	6	25	1,000
	%	4,0	2,9	2,4	71,4	
No	n	4	3	3	10	
	%	11,4	8,6	8,6	28,6	
I think the vaccine is useful						
Yes	n	7	6	2	15	0,381
	%	20,0	17,1	5,7	42,9	
No	n	8	5	7	20	
	%	22,9	14,3	20,0	57,1	
My doctor suggested I get vaccinated						
Yes	n	9	9	6	24	0,581
	%	25,7	25,7	17,1	68,6	
No	n	6	2	3	11	
	%	17,1	5,7	8,6	31,4	
If your answer is no, the reason for not being vaccinated (n=340)						
I don't want it because it will harm my baby						
Yes	n	154	71	20	245	**<0,001**
	%	45,3	20,9	5,9	72,1	
No	n	40	35	20	95	
	%	11,8	10,3	5,9	27,9	

Variable		Insufficient	Problematic-Limited	Satisfactory/ Excellent	Total	p
I gave up getting vaccinated because I was pregnant						
Yes	n	180	94	36	310	0,472
	%	52,9	27,6	10,6	91,2	
No	n	14	12	4	30	
	%	4,1	3,5	1,2	8,8	
It's not time for me to get vaccinated						
Yes	n	4	9	13	16	**0,027**
	%	1,2	2,6	0,9	4,7	
No	n	190	97	37	324	
	%	55,9	28,5	10,9	95,3	
I think the vaccine will harm my body						
Yes	n	119	49	18	186	**0,017**
	%	35,0	14,4	5,3	54,7	
No	n	75	57	22	154	
	%	22,1	16,8	6,5	45,3	
Number of COVID-19 vaccine doses you have received (n=285)						
1	n	19	8	2	**29**	0,217
	%	6,7	2,8	0,7	10,2	
2	n	99	65	31	195	
	%	34,7	22,8	10,9	68,4	
3	n	25	22	**6**	**53**	
	%	8,8	7,7	2,1	18,6	
4	n	4	1	3	8	
	%	1,4	0,4	1,1	2,8	
Having sufficient knowledge about vaccination (n=375)						
Yes	n	**35**	**65**	**34**	**134**	**<0,001**
	%	9,3	17,3	9,1	35,7	
No	n	174	52	15	241	
	%	46,4	13,9	4,0	64,3	
Status of recommending vaccination to the public (n=375)						
Yes	n	158	100	42	300	0,055
	%	42,1	26,7	11,2	80,0	
No	n	51	17	7	75	
	%	13,6	4,5	1,9	20,0	
Status of following COVID-19 vaccine developments (n=375)						
Yes	n	8	37	32	77	**<0,001**
	%	2,1	9,9	8,5	20,5	
No	n	201	80	17	298	
	%	53,6	21,3	4,5	79,5	

Table 6. The impact of COVID-19 characteristics of pregnant women on their health literacy levels (Continue)

*p≤0.05 was considered statistically significant. *Chi-square test was used.

DISCUSSION

We obtained some important data by applying the TSOY-32 scale in the study, which examined the relationship between variables such as socio-demographic characteristics, obstetric characteristics, vaccination status and attitudes and behaviors towards vaccines and health literacy levels of pregnant women. In studies using the TSOY-32 scale, it was observed that the average TSOY-32 scale general index score of pregnant women was between 34.49±9.14 and 58±8.15 (19,20). Although there are many studies on the COVID-19 pandemic, there is insufficient research on its relationship with health literacy. In the study, it was determined that there was a significant relationship between employment status, which is among the socio-demographic characteristics that affect the status of pregnant women to receive the COVID-19 vaccine. When the literature was examined, a significant relationship was observed between the acceptance of the COVID-19 vaccine by those with high income levels (21). In the study, it was determined that there was a significant relationship between social security status, which is among the socio-demographic characteristics that affect the status of pregnant women to receive the COVID-19 vaccine. In order to examine the effect of nursing students' COVID-19 vaccine literacy and socio-demographic characteristics on their COVID-19 vaccine attitudes, Gökşen et al.'s (2023) descriptive and relational study included 503 nursing students and found that 64.2% (n) =323) had social security, while 35.8% (n=180) did not have social security. In the study, no significant relationship was seen between nursing students' attitudes towards COVID-19 vaccination and social security (22). The study determined that there was a significant relationship between the status of COVID-19 vaccination in pregnant women and their health literacy levels. ACOG recommends vaccination for all pregnant women of reproductive age, breastfeeding mothers, and women planning to become pregnant (6). Vaccine administration is among the protective and preventive measures against the COVID-19 pandemic (23). In a study conducted

in our country by Goncu Ayhan et al. (2021), when we look at the attitudes of pregnant women regarding COVID-19 vaccines, 37% of them are positive about being vaccinated, and among the reasons for not being vaccinated for pregnant women who have not been vaccinated, the most common reasons for not being vaccinated are lack of information about the safety of vaccines and their risk to the fetus. It has been determined that there is a possibility of harm (Goncu Ayhan et al., 2021) In a recent systematic review by Shamshirsaz et al. (2021), although the rate of pregnant women getting the COVID-19 vaccine was observed to be low, the frequency of getting the COVID-19 vaccine was higher among pregnant women who had Tdap (tetanus, diphtheria, acellular pertussis) and seasonal influenza vaccines, which are among the inactive vaccines. It has been found to be excessive (24). The study determined that there was a significant relationship between the status of pregnant women receiving the COVID-19 vaccine during pregnancy and their health literacy levels. In Demir's (2023) study, which was conducted using the phenomenology design, one of the qualitative research methods, in which they included 10 pregnant women, in order to examine the thoughts of pregnant women about coronavirus infection and COVID-19 vaccines, specifically against vaccination, ten pregnant women participating in the study were asked about their thoughts about COVID-19 vaccines. Six of them stated that their pregnancy status did not affect their COVID-19 vaccination status, five stated that they were affected by their spouse's vaccination status, four stated that they did not receive sufficient assurance from anyone about the vaccine, ten stated that they were most worried about their baby, and nine stated that COVID-19 vaccines were not safe during pregnancy (25). Therefore, presenting information about vaccination practices during pregnancy and the effects of vaccines in a transparent manner will help alleviate the concerns of pregnant women about vaccination. The study determined that there was no significant relationship between the number of COVID-19 vaccine doses, vaccine types and

next vaccine preferences of pregnant women and their health literacy levels. In a descriptive study by Aloğlu and Sönmez (2021) in which they included 1708 volunteers, male and female, aged 18 and over, in order to examine the impact of the COVID-19 pandemic on individuals and their attitudes towards the COVID-19 vaccine, 56.8% of the participants It was determined that while 43.2% of the population wanted to get vaccinated, 43.2% did not want to have it, 20.5% preferred the CoronaVac (Sinovac) vaccine, 24.7% preferred the BioNTech vaccine and 47% preferred the local vaccine, the Turkovac vaccine (26) In the study, it was determined that there was a significant relationship between pregnant women's ability to have sufficient knowledge about vaccination and their health literacy levels. When the literature was examined, it was seen that pregnant women's increased confidence in COVID-19 vaccines and adequate knowledge about vaccines were an important factor in positively changing attitudes towards vaccines (27). In another study, it was determined that posts on social media, as well as doctors, who are among the health professionals who are effective in gaining knowledge about the vaccine, are also an important factor in affecting the society's perspective on the vaccine (28). In the study, it was determined that there was no significant relationship between the status of pregnant women recommending the vaccine to others and their health literacy levels. In a descriptive study by Özkan and Yiğit (2022) in which they included 63 health care workers at family health centers in the central districts of Kayseri, in order to determine the attitudes of primary health care workers towards the COVID-19 vaccine and the relationship between COVID-19 disease perceptions during the coronavirus epidemic, 95% It was determined that 2.2% (n=60) recommended the vaccine to their patients, while 4.8% (n=3) did not recommend the vaccine to their patients (29). The study determined that there was a significant relationship between pregnant women's ability to follow developments regarding the COVID-19 vaccine and their health literacy levels. In order to examine the impact of the

COVID-19 pandemic on individuals and individuals' attitudes towards the COVID-19 vaccine, Aloğlu and Sönmez's (2021) descriptive study included 1708 volunteers, women and men aged 18 and over, and found that developments regarding the COVID-19 vaccine were 38% higher. 1.1% (n=650) from TV, 31.1% (n=531) from the internet, 28.2% (n=481) from social media, 2.1% (n=36)) from their close circle and 0.6% (n=10) from newspapers (26).

Limitations of the study

Since the study is based on the statements of pregnant women, effects such as information and recall biases may occur. Since the study is carried out from a single center, there may be problems in the generalizability of the data to the universe. For this reason, a larger sample size can be reached.

CONCLUSION AND SUGGESTIONS

As a result of the study, it is observed that the health literacy levels of pregnant women who were determined to have an approach, attitude and behavior towards COVID-19 vaccines during the COVID-19 pandemic period were insufficient. In line with these results, the multidisciplinary team approach of doctors and midwives, who are health professionals, should be supported and the knowledge level of pregnant women with low health literacy about COVID-19 vaccines should be increased. In the pre-pregnancy period, women should be supported to increase their confidence in the vaccine by identifying the content, importance and possible side effects of COVID-19 vaccines, misconceptions about vaccination and the real reasons and reservations underlying refusing to be vaccinated, and providing them with the necessary training. Due to the importance of informed women educated before pregnancy in providing accurate, reliable and effective information during pregnancy, birth, breastfeeding and the postpartum period, it will contribute to preventing anti-vaccine thoughts, developing vaccine awareness and increasing trust in vaccines. Guiding pregnant women in the risk population group and increasing their awareness is

also important for the continuity of immunization during the pandemic process. It has been observed that increasing the awareness levels of pregnant women will contribute to their approach, attitude and behavior towards vaccines and the pandemic period.

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