The Relationship Between Health Literacy Level of Pregnant Women and COVID 19 Knowledge, Attitudes and Behaviors

Gebe Kadınların Sağlık Okuryazarlığı Düzeyinin COVID 19 Bilgi, Tutum ve Davranışlarıyla İlişkisi

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Öz	
Objective	This study was conducted to determine pregnant women's health literacy level and evaluate the relationship between the determined health literacy levels with COVID 19 knowledge, attitudes, and behaviors.
Materials and Methods	This descriptive and cross-sectional study was conducted on 381 pregnant women between September 2020 and February 2021. The questionnaire, 25 questions about socio-demographic characteristics and knowledge, attitudes and behaviors with COVID 19, and "Turkey Health Literacy Scale-32 (THLS-32)" consisting of 32 questions was applied by face-to-face interview technique.
Results	The average age of participants is 28.70 ± 5.45, and 58.8% of them have an education level above high school. It is the first pregnancy of 27.0% of participants. The average week of gestation is 22.45 ± 9.94. Of the participants, 23.9% have inadequate, 19.7% limited, 28.3% adequate and 28.1% have excellent general health literacy. The average general health literacy average is 33.28 ± 12.63. Health literacy level is high in participants with education level, employment, number of pregnancies and lower pregnancy (p <0.05). Adequate health literacy level is higher in participants who say fever, respiratory distress, and cough are the symptoms of COVID-19 (p <0.05). Adequate health literacy (disease prevention and health promotion) level is higher in participants who avoid close contacts such as handshaking or hugging (p <0.05).
Conclusion	More than half of pregnant women is adequate health literacy levels. Adequate health literacy is high in compliance COVID-19 rules. Improving health literacy can provide benefits in solving both COVID-19 disease and other health problems.
Keywords	Health Literacy; Pregnant; COVID-19; Behavior

Abstract	
Amaç	*Bu çalışma gebe kadınların sağlık okuryazarlık düzeyini belirlemek ve belirlenen sağlık okuryazarlık düzeylerinin COVID 19 bilgi, tutum ve davranışlarıyla İlişkisini değerlendirmek amacıyla yapılmıştır.*
Gereç ve Yöntemle	*Tanımlayıcı ve kesitsel nitelikteki bu çalışma Eylül 2020 – Şubat 2021 tarihleri arasında 381 gebe kadın üzerinde uygulanmıştır. 25 sorudan oluşan sosyo-demografik özellikler ve COVID 19 ile bilgi, tutum ve davranışları ve 32 sorudan oluşan "Türkiye Sağlık Okuryazarlığı Ölçeği -32" (TSOY-32) anket formu ile yüz yüze görüşme tekniği ile uygulanmıştır.*
Bulgular	*Araştırmaya katılanların; yaş ortalaması 28,70±5,45 olup, %58,8'i lise ve üzeri eğitim düzeyine sahiptir. Katılımcıların %27,0'ının (103 gebe) ilk gebeliği olup ortalama gebelik haftası 22,45±9,94'tür. Katılımcıların %23,9'u yetersiz, %19,7'si sınırlı, %28,3'ü yeterli ve %28,1'i mükemmel sağlık okuryazarlığı düzeyindedir. Ortalama genel sağlık okuryazarlık ortalaması 33.28±12.63'dür. Eğitim düzeyi, çalışma, gebelik sayısı ve düşüğü olanlarda yeterli sağlık okuryazarlık düzeyi yüksektir (p<0,05). COVID-19'un semptomları olarak ateş, solunum sıkıntısı ve öksürük olduğunu söyleyenlerde yeterli sağlık okuryazarlık düzeyi daha yüksektir (p<0,05). Tokalaşma, sarılma gibi yakın temaslardan kaçınanlarda yeterli sağlık okuryazarlık (hastalık önleme ve sağlığı geliştirme) düzeyi daha yüksektir (p<0,05).*
Sonuç	*Gebe kadınların yarıdan fazlası yeterli sağlık okuryazarlığı düzeyindedir. COVID-19 kurallarına uyumda yeterli sağlık okuryazarlık düzeyi yüksektir. Sağlık okuryazarlığının geliştirilmesi hem COVID-19 hastalığı hem de diğer sağlık sorunlarının çözümünde yarar sağlayabilir.*
Anahtar Kelimeler	*Sağlık Okuryazarlığı; Gebe; COVID-19; Davranış*

INTRODUCTION

On the last day of 2019, pneumonia with unknown cause was reported in Wuhan, China's Hubei Province. In the first days of 2020, it was determined that pneumonia cases with an unknown cause were a new coronavirus that had not been detected in humans before. Coronavirus cases, which started to be seen in neighboring countries after China, spread rapidly and started to be seen in many countries.[1] With the increase in the number of countries and cases with coronavirus, the World Health Organization (WHO) defined it as an "international public health emergency" on 30 January 2020 and a "global epidemic (pandemic)" on 11 March 2020.[2]

Coronaviruses, which have different types, cause severe respiratory distress, starting from the common cold. The most known of these are; "Middle East Respiratory Syndrome Coronavirus (MERS)" and "Severe Acute Respiratory Syndrome (SARS)" which are viruses defined in previous years and which affected large masses.[3] The coronavirus outbreak was initially named "SARS-CoV-2" due to its similarity to SARS and later named "Coronavirus Disease-2019 (COVID-19)".[4]

COVID-19; has an average incubation period of 2-14 days. Although droplets mainly transmit COVID-19, it can also be transmitted by contacting of infected people with other individuals' hands and then taking the hands to the mouth, nose and eye mucosa. Although the infection's typical symptoms are respiratory symptoms such as fever, cough and dyspnea, uncommon symptoms such as head and sore throat, runny nose, muscle, joint pain, extreme weakness, loss of taste and smell, and diarrhea can also be seen. Although the disease can be asymptomatic, kidney failure, pneumonia, severe acute respiratory tract infection, and death may develop in extreme cases.[5]

Health literacy, which impacts the effective use of health information, can be defined as "the motivation, knowledge, and competence used to access, understand, evaluate and apply health information and make health-related decisions." Adequate health literacy enables the individual to make informed healthcare provision decisions, disease prevention, and health promotion issues.[6] Inadequate health literacy is shown as less use of preventive health services, delay in seeking health care during periods of symptoms, failure to understand the individual's medical condition and adherence to medical instructions resulting in increased health care costs and increased mortality.[7-10]

Pregnancy refers to an average of 280 days (40 weeks) from the first day of the last menstruation, starting with the union of the ovum and sperm.[11,12] Although pregnancy is a natural event, it causes important anatomical, physiological and psychological changes in the organism of the pregnant woman.[13] Pregnancy and pregnancy-related complications are considered among the major causes of morbidity and mortality among women of childbearing age, especially in developing countries.[14] Risks that may occur with pregnancy are important not only for the health of the pregnant but also for the health of the fetus. Providing adequate and qualified prenatal care is one of the main things to be done for the health of both pregnant women and fetuses. Early diagnosis and treatment of health problems that may occur during pregnancy can be provided with antenatal care. Antenatal care, can reduce the mortality and morbidity that may occur and protect and improve the mother, fetus, and newborn's health.[15,16] According to the "Antenatal Care Management Guideline" published by the Ministry of Health, a pregnant woman receives qualified antenatal care at least four times during pregnancy. According to the guideline, the first follow-up should be done before the 14th week of pregnancy, the second at 18-24 weeks, the third at 24-28 weeks, and the fourth at 36-38 weeks.[17] According to the 2018 Turkey Demographic and Health Survey (TDHS) data, 90.0% of pregnant women received antenatal care at least four or more times. Antenatal care consists of urine and blood analysis, blood pressure measurement, ultrasound scanning, weight monitoring, iron supplements, tetanus vaccine, and the abdomen's ex-

ternal palpation.[18]

Some physiological changes in the cardiorespiratory and immune systems during pregnancy make pregnant women more susceptible to infections.[19] Due to influenza infection pregnant women applied to hospitals 6.8 times more than non-pregnant women and their need for intensive care was 6.5 times higher.[20] Although there is no data that pregnant women have a higher risk of contracting COVID-19 infection, the risk of developing complications and morbidity has increased in pregnant women with sub-diseases.[21,22] Studies show that the preterm delivery and cesarean frequency are increased in cases who had COVID-19 during pregnancy. In a systematic review examining 790 cases with COVID-19 during pregnancy, the preterm delivery rate was 23% and the cesarean rate was 72%.[23] In another study involving 427 cases with COVID-19 during pregnancy, the preterm delivery rate was reported as 27% and cesarean rate as 59%.[24] Another problem for those who have had COVID-19 during pregnancy is the transmission of the virus from mother to the fetus or baby. Although vertical transition's extent and clinical significance are still unclear, possible vertical transition cases have been reported, especially in maternal infections in the last trimester.[25] In a study in which nine pregnant women diagnosed with COVID-19 were followed-up, the presence of viruses was detected in two newborns.[26]

Women's and children's health are of great importance in the formation of healthy families and societies. The concept of being healthy for children depends on a healthy start to life from the antenatal period and a healthy growth and development process. Therefore, health literacy in women is vital in terms of both women's and children's health promotion and diseases prevention.[27]

This study was conducted to pregnant women's health literacy level and evaluate the relationship between the determined health literacy levels with COVID 19 knowledge, attitudes, and behaviors.

MATERIAL and METHODS

This cross-sectional and descriptive study was conducted on pregnant women who applied to the Gynecology and Obstetrics Outpatient Clinic of Erciyes University Hospitals between 15 September 2020 and 15 February 2021. For the study, approval from the Scientific Research Evaluation Commission of the Ministry of Health and the ethics committee approval (Decision No: 2020.32 on 12.10.2020) from the Scientific Research and Publication Ethics Committee of Cappadocia University was obtained. The study was carried out in accordance with the Helsinki Declaration Principles. Sample size in the study; "Turkey Health Literacy Survey," which according to the average general health literacy index were calculated based on the study results 30.4 (While this rate was 21.1 for the illiterate, this rate increased as the education increased to 33.8 for undergraduate graduates and 36.0 for master / doctorate graduates). Assuming that the average of the general health literacy index in pregnant women is similar (considering that it is from every education level) and could be 30.4; at 95% confidence interval, alpha = 0.05, power Beta = 0.80, effect size d = 0.10 were calculated as 357 pregnant women to be sampled.28 Four hundred fifty people were included in the study as there might be problems such as incomplete questionnaires. At the end of the study, the questionnaire forms of 381 pregnant women were evaluated. The reach rate is 84.7%. Researchers prepared 12 questions about their socio-demographic characteristics and 13 questions related to their knowledge, attitude and behavior with COVID 19 for the pregnant women who applied to the Gynecology and Obstetrics Outpatient Clinic. In order to determine health literacy, a questionnaire form consisting of 32 questions, "Turkey Health Literacy Scale-32 (THLS-32)" was applied.29 Participants were informed about the subject and purpose of the study. An informed consent form was signed by all the participants before enrollment in the study. The questionnaire form consisted of face-to-face interview techniques following the pandemic rules (appropriate physical distance, etc.).

THLS-32 consisted of two dimensions (Health treatment and service, Disease Prevention and Health Promotion) and four information processing processes (accessing health-related information, understanding health-related information, evaluating health-related information, and evaluating health-related information). Each of the 32 questions was scored between 1 and 4 (1 = very difficult, 2 = difficult, 3 = easy, 4 = very easy). Each question was based on the principle of evaluating how "easy" or "difficult" the specified behavior was, according to a person's own perception. As a result of the scale with the lowest "0 points" and the highest "50 points," the score range of 0-25 was defined as "inadequate," (> 25-33) the score range as "limited," (> 33-42) score range as "adequate" and (> 42-50) as "excellent" health literacy.

In the evaluation of chi-square test, "inadequate, limited/ problematic, adequate, excellent" health literacy categories were re-categorized as adequate and inadequate health literacy. The data were evaluated with the SPSS 15.0 program. The Shapiro-Wilk test was used to evaluate whether the data were normally distributed. The mean and standard deviation was used for continuous data as descriptive statistics, whereas the number and percentage values were presented for categorical variables. The value of p<0.05 was accepted as statistically significant.

RESULTS

Of the pregnant women, 23.9% has inadequate, 19.7% limited, 28.3% adequate and 28.1% had excellent general health literacy. The average general health literacy average was 33.28 ± 12.63. In the sub-dimensions, the highest level of adequate (adequate /excellent) health literacy was at the literacy of apply-use information relevant to health with 68.2%. In the sub-dimensions, the lowest level of adequate (adequate /excellent) health literacy was at the literacy of Appraise/Judge/Evaluate information relevant to health with 50.1%. (Table 1).

As the education level increased, the level of health literacy increased. While 47.1% of those with primary and lower education levels had adequate health literacy levels, this rate increased to 51.8% at the high school level and 74.5% for those with university education levels. The difference is statistically significant (p=0.000). As the number of pregnancies increases, the level of health literacy decreases. Adequate health literacy level, 64.1% in those with one pregnancy, decreased from 57.3% in those with 2-3 pregnancies to 46.2% in those with four or more pregnancies. The difference is statistically significant (p=0.040). Adequate health literacy levels are lower in those who use traditional contraceptive methods, those with chronic diseases, smokers, and those who consume alcohol. However, the differences are not statistically significant (Table 2).

Adequate health literacy level is higher in those who use masks and hand disinfectants, which are the most commonly used personal protective equipment. The level of adequate health literacy is higher in pregnant women who say their COVID-19 symptoms like fever, respiratory distress, and cough. The difference is statistically significant (p=0.028/0.000/0.015). Pregnant women who think that COVID-19 is not transmitted through breast milk and complies with COVID-19 bans are higher in adequate health literacy. However, the differences were not statistically significant. Although the inadequate health literacy level is higher in those who think that COVID-19 creates an atmosphere of panic, the difference was not statistically significant (Table 3).

Pregnant women who respond that in case of continuous coughing / sneezing, cover the mouth and nose with a disposable tissue and avoid close contacts such as handshaking and hugging, have a higher level of adequate health literacy (Disease Prevention and Health Promotion Health Literacy). The difference is statistically significant (p=0.000, Table 4).

Table 1. Distribution of General and Sub-Dimensions Health Literacy Indexes of Pregnant Women									
Health Literacy Indexes (n=381)	Inadequate		Problematic		Adequate		Excellent		Average Health Literacy Score
	n	%	n	%	n	%	n	%	
General Health Literacy	91	23.9	75	19.7	108	28.3	107	28.1	33.28±12.63
Health treatment and service Health Literacy	75	19.7	73	19.2	126	33.1	107	28.1	33.64±12.46
Disease Prevention and Health Promotion Health Literacy	99	26.0	61	16.0	112	29.4	109	28.6	32.67±13.76
Access/Obtain Information Relevant to Health	100	26.2	43	11.3	128	33.6	110	28.9	33.17±13.38
Understand Information Relevant to Health	86	22.6	66	17.3	106	27.8	123	32.3	33.93±13.33
Appraise/Judge/Evaluate Information Relevant to Health	134	35.2	56	14.7	114	29.9	77	20.2	30.10±13.75
Apply /Use Information Relevant to Health	72	18.9	49	12.9	129	33.8	131	34.4	35.42±13.11

Table 2. Adequate Health Literacy Levels According to Various Characteristics of Pregnant Women						
Characteristic		Total	Adequate HL (n=215)		X^2	p
			n	%		
Age Group (Years)	25 and under	117	73	62.4	2.750	0.253
	26-35	220	120	54.5		
	35 and over	44	22	50.0		
Education	Primary school and lower	157	74	47.1	**21.214**	**0.000**
	High school	114	59	51.8		
	University degree	110	82	74.5		
Occupation	Working	85	57	67.1	**5.027**	**0.025**
	Not Working (housewife)	296	158	53.4		
Spouse's occupation	Health professional	16	10	62.5	0.250	0.617
	Non-Health professional	365	205	56.2		
Number of pregnancies	1	103	66	64.1	**6.437**	**0.040**
	2-3	185	106	57.3		
	4 and over	93	43	46.2		
Lower pregnancy	Yes	124	59	47.6	**5.856**	**0.016**
	No	257	156	60.7		
Contraceptive methods (n=178)	Modern	132	78	59.1	0.667	0.414
	Traditional	46	24	52.2		
Chronic disease	Yes	92	48	52.2	0.894	0.344
	No	289	167	57.8		
Smoking	Yes	60	33	55.0	0.059	0.808
	No	321	182	56.7		
Alcohol drinking	Yes	6	3	50.0	0.103	0.749
	No	375	212	56.5		

Table 3. COVID-19 Knowledge, Attitude and Behavior Characteristics in Pregnant Women by Health Literacy Levels

COVID-19 Knowledge, Attitudes and Behavior		Inadequate HL (n=166)		Adequate HL (n=215)		X²	p
		n	%	n	%		
The most frequent personal protective	Mask	150	90.4	201	93.5	1.263	0.261
	Hand disinfectants	51	30.7	73	34.0	0.445	0.505
The most common symptom of COVID-19*	Fever	102	61.4	155	72.1	4.837	**0.028**
	Respiratory distress	83	50.0	146	67.9	12.527	**0.000**
	Cough	78	47.0	128	59.8	5.938	**0.015**
COVID-19 transmission *	Close Contact	119	71.7	159	74.0	0.244	0.621
	Respiratory	51	30.7	88	40.9	4.212	**0.040**
Frequency to follow the COVID-19 process	Always	75	45.2	108	50.2	2.072	0,722
Source to follow the COVID-19 process	TV/Radio	122	73.5	167	77.7	0.894	0.344
	Internet	71	42.8	115	53.5	4.306	**0.038**
Complying with COVID-19 bans	Yes	155	93.4	208	96.7	2.364	0.124
COVID-19 caused panic	Yes	99	59.6	111	51.6	2.430	0.119
COVID-19 positive in the family	Yes	98	59.0	147	68.4	3.557	0.059
COVID-19 is not transmitted through breast milk	Yes	118	71.1	159	74.0	0.389	0.533
* Multiple options are marked.							

Table 4. Compliance with COVID-19 Rules by Adequate Health Literacy (Disease Prevention and Health Promotion) Levels in Pregnant Women

COVID-19 Knowledge, Attitudes and Behavior	Inadequate HL (n=160)		Adequate HL (n=221)		X²	p
	n	%	n	%		
Wash your hands frequently with soap and water for at least 20 seconds	150	93.8	214	96.8	2.083	0.353
Cover the mouth and nose with disposable wipes during coughing or sneezing. If there is no wipe, use the inside of the elbow.	136	85.0	216	97.7	**22.539**	**0.000**
Keep at least 3-4 steps away from people who show signs of a cold.	146	91.3	211	95.5	2.814	0.245
Ventilate the rooms every day.	150	93.8	216	97.7	**7.323**	**0.026**
Avoid close contacts such as handshaking or hugging.	143	89.4	211	95.5	**8.271**	**0.016**
Do not touch your eyes, mouth, and nose with your hands.	127	79.4	202	91.4	**11.963**	**0.003**
Do not share your personal belongings such as towels.	137	85.6	199	90.0	2.909	0.234
Do not take goods and food into the house without wiping-washing.	122	76.3	176	79.6	4.483	0.106
Pay attention to drink plenty of fluids.	140	87.5	202	91.4	2.058	0.357
Pay attention to balanced nutrition.	136	85.0	201	91.0	3.375	0.185
Pay attention to sleep patterns.	120	75.0	172	77.8	0.797	0.671
* Always						

DISCUSSION

In a study conducted in 2014, 26.2% of teachers (Male 18.4% / Female 41.7%), in a study conducted in 2016, 28.8% of academicians (Male 27.6% / Female 31.5%) and in a study conducted in 2016, it was found that 30.6% of the participants (Male 28.8% / Female 32.5%) had adequate (adequate / excellent) health literacy.29-31 Also, in national and international studies, it has been found that as the education level increases, the level of health literacy also increases.32-34 In a study conducted in Erzurum in 2017, 54.9% of pregnant women were found to have adequate (adequate /excellent) health literacy.35 In our study, a total of 56.4% of pregnant women, 23.9% of whom were inadequate, 19.7% were limited, 28.3% were adequate and 28.1% were at an excellent level, in total, 56.4% were at the level of adequate health literacy and as the education level increased, the level of adequate health literacy increased (Tables 1 and 2). The health literacy level of pregnant women is higher than the studies conducted in both private groups. The general society may be due to the importance of health literacy in recent years and the positive and synergy effect of higher education on women's health.

It is reported that the level of health literacy also affects women's knowledge about contraception and family planning.36 In a study, it was found that women with high levels of health literacy have higher knowledge about contraception methods and the days when pregnancy may be at risk in the monthly cycle.37 In another study, unplanned pregnancies were higher in women with low health literacy levels.38 In our study, there is an inverse relationship between the number of pregnancies and the level of health literacy. Adequate health literacy decreases as the number of pregnancies increases. While 64.1% of the pregnant women with one pregnancy are at the adequate health literacy level, the adequate health literacy level is 46.2% in pregnant women with a pregnancy number of four and above (p=0.040). Similarly, while pregnant women's adequate health literacy level with an abortion is 47.6%, this rate is 60.7% in pregnant women without abortion (p=0.016).

Adequate health literacy level is high among those using modern methods of contraception (Table 2).

One of the factors influenced by the level of health literacy recognizing the person's health problems, applying to the health institution at the right time, and complying with the treatment and follow-up. The most common clinical symptoms and signs in COVID-19 are fever (37.8 or 38°C) (88%) and dry cough (68%). It has been found that more than 80% of hospitalized patients have one of these two symptoms.20 In our study, adequate health literacy level was higher in pregnant women who said that cough, respiratory distress and fever are common symptoms of COVID-19 (p=0.028/0.000/0.015, Table 3). Knowing the symptoms of COVID-19 for pregnant women will enable early applications to healthcare institutions. Early application to healthcare institutions can have positive results in terms of the course of the COVID-19 disease.

As the rate of understanding and using the necessary information individuals' health increases, the behaviors of preventing diseases and providing early diagnosis of diseases increase.36 In our study, the highest sub-dimension of the health literacy index was "Apply /Use Information Relevant to Health" with 68.2% and "Understand Information Relevant to Health" with 60.1% (Table 1). Pregnant women were found to comply with the COVID-19 rules at a rate of 76.4- 96.1% (Table 4). In all COVID-19 rules, adequate health literacy (disease prevention and health promotion) levels are high. The differences between them were found to be statistically significant in those who said that they avoided close contacts such as handshaking and hugs, that they ventilate the rooms every day, and that they cover the mouth and nose in the case of coughing/sneezing, or the inside of the elbow (Table 4).

The fact that the study was conducted only in a public (university) hospital is a limitation of the study. For this reason, its results cannot be generalized to the whole population.

CONCLUSION

Adequate health literacy level is high in pregnant women. Adequate health literacy level is higher in pregnant women who identify fever, respiratory distress and cough as the symptoms of COVID-19. With all COVID-19 rules, adequate health literacy levels are high. Health literacy levels of pregnant women in accessing and evaluating health-related information are lower. The number of studies that improve pregnant women's health literacy and enable them to access and evaluate health information should be increased. Improving health literacy in pregnant women can benefit from solving problems related not only to COVID-19 disease but also to other health conditions. Thus, it can have a positive effect on the health of both pregnant women and their children.

Ethics approval for this study was obtained from Scientific Research and Publication Ethics Committee of Cappadocia University (Decision No: 2020.32 on 12.10.2020)

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