

# The Relationship between Health Literacy and Health Practices in Pregnancy and their Affecting Factors: A Cross-Sectional Study

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ARTICLE INFO	ABSTRACT
Article type: Original article	<b>Background &amp; aim:</b> Health literacy is the ability to appraise proper health-related behaviors. Women's health literacy levels affect not only their own health but also pregnancy, fetus, newborn, and child health. This study aimed to determine the relationship between health literacy and health practices in pregnancy and identify its affecting factors.
Article History: Received: 07-Apr-2022 Accepted: 26-Jun-2022	<b>Methods:</b> The sample of this cross sectional study consisted of 374 pregnant women who visited the Obstetrics and Gynecology Polyclinic of a University Hospital between the 1st of March and the 1st of October, 2018 in Ankara, Turkey. Data were collected using Demographic Questionnaire, Health Literacy Index, and Health Practices in Pregnancy Scale. The data were evaluated using SPSS 25.0. For analysis, Mann-Whitney U test, Kruskal-Wallis test, Dunn's test, Spearman Rho correlation analysis, Linear regression analysis were used.
Key words: Pregnancy Health Literacy Health Practices	<b>Results:</b> Pregnant women had a good health literacy and an above-average health practice level. A positive and significant relationship was found between health literacy and health practices ( $p < 0.05$ ). Income level, the place where women spent their childhood, perception of pregnancy, and behaviors demonstrated in case of a health problem were found as influencing factors of health literacy level. Health practices in pregnancy were found to be significantly affected by age, educational level, perception of pregnancy, and behaviors demonstrated in case of a health problem ( $p < 0.05$ ).
	<b>Conclusion:</b> The study indicates that health literacy and health practices in pregnancy are affected by many important socio-demographic characteristics. In addition, health practices demonstrated during pregnancy increase with the increase in pregnant women's health literacy levels.

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## Introduction

The World Health Organization (WHO) defines health literacy as "individuals' ability to access, understand and use healthcare information for the purpose of protecting and maintaining their health" (1). Health literacy is the ability to appraise many proper health-related behaviors. These behaviors may include using medication properly, knowing how to benefit from healthcare services, understanding and signing informed consent forms, making decisions about self-care and the management

of diseases, using medical devices at home properly, and undertaking the role of caregiver (2).

Women's health literacy levels affect not only their own health but also pregnancy, fetus, newborn, and child health (3). Pregnancy is one of the most important phenomena affecting women's health. Health practices performed by women during the pregnancy period affect the woman's and baby's health during the pregnancy and postpartum periods (4).

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Health practices in pregnancy can be defined as the activities that include the health status of pregnant women, fetus, and newborn and that affect the progress and outcomes of the pregnancy. Thus, a healthy pregnancy period depends on a thorough knowledge of pregnancy care and correct implementations in the real sense. Health practices during pregnancy include issues such as balanced nutrition and correct amount of weight gain, regular exercises, dental care, education on pregnancy and birth, avoiding smoking, immunization, avoiding alcohol-illegal substances and excessive medication, and avoiding risky sexual behaviors or exposure to other infection agents (5).

Having a high health literacy level in pregnancy is critical for women in performing health practices as well as protecting and improving their health during pregnancy. Women should have information about each stage of pregnancy so that they can manage their decisions in this period. However, many women do not understand the medical instructions or prescriptions given by the doctors in this period, which causes them to experience an unhealthy pregnancy period, unhealthy pregnancy outcomes, or an undesired parental experience at an early age (6). A significant relationship is reported to exist among women's health literacy levels, receiving prenatal care, and experiencing a healthy pregnancy. Therefore, improving pregnant women's health literacy level is crucial (3).

Women with adequate health literacy levels were reported to demonstrate positive differences regarding the issues such as beginning prenatal care and frequency of follow-ups, weight gain in pregnancy, gestational age, type of delivery, use of folic acid and iron tablets, and birth weight of the newborn (7). The related literature reports a positive relationship among the adequate health literacy level, positive pregnancy behaviors, and a healthy pregnancy period (8-11).

Pregnancy is a period when women benefit from healthcare services most frequently and when they are open to learning about health-related information and behaviors. This period could be an opportunity to increase the health literacy level. Knowing the health literacy level is considered to be the first step for improving

this level. It is thus important to identify the health literacy level of pregnant women who benefit from health services so that the problem can be defined and pregnant women can cooperate with health practices in pregnancy. Therefore, knowing pregnant women's health literacy level and its effects on health practices is considered to be important.

This descriptive study aimed to determine the relationship between health literacy and health practices in pregnancy and identify their affecting factors.

### Materials and Methods

This study was conducted at Etlik Zübeyde Hanım Obstetrics and Gynecology Training and Research Hospital in Health Sciences University between the 1st of March and the 1st of October 2018. The hospital where the study was conducted is located in Ankara, the capital city of Turkey.

The target population of the study was women who visited the pregnancy polyclinic of the related hospital for their follow-ups and treatment within a one-month period. In Turkey, the Ministry of Health recommends every pregnant woman receive quality follow-up care at least four times.

The sample size of the study was determined using the approach for a known population. The number of pregnant women who visited the polyclinic within a one-month period (1st of January and 1st of February 2018) was 14,000. Sample Size Calculator website was used for sample size calculation (12). The minimum sample size to be reached at 5% error probability ( $\alpha=0.05$ ) and 95% power ( $1-\beta=0.95$ ) was calculated as 374 with a population of 14,000.

The pregnant women who agreed to participate and had no mental deficiency were included in the study. The women with a high-risk pregnancy were excluded.

The data collection tools included the Demographic Questionnaire, the Health Literacy Index, and the Health Practices in Pregnancy Scale.

A Demographic Questionnaire developed by the researchers in line with the literature<sup>1-10</sup> consisted of 23 questions that aimed to collect data regarding pregnant women's socio-demographic and obstetric characteristics.

The 47-item Health Literacy Survey in Europe (HLS-EU) developed by Sorensen (2013) was then simplified by Toçi, Bruzari, and Sorenson et al. (2013) as the Health Literacy Index (11-13); Aras and Temel performed the Turkish validity and reliability of the index in 2017. The Health Literacy Index consists of 25 items and four sub-scales. Accessing Information consists of five items (items 1-5); the minimum and maximum scores on this sub-scale are 5 and 25, respectively. Understanding the Information consists of seven items (items 6-12); the minimum and maximum scores on this sub-scale are 7 and 35, respectively. Processing/Appraising information consists of eight items (items 13-20); the minimum and maximum scores on this sub-scale are 8 and 40, respectively. Applying/Using information consists of five items (items 21-25); the minimum and maximum scores on this sub-scale are 5 and 25, respectively. The scores obtained from the whole scale range from 25 to 125. The items are rated on a 5-point Likert-scale as follows: 5: I do not have difficulty at all, 4: I have slight difficulty, 3: I have moderate difficulty, 2: I have considerable difficulty, 1: I cannot do/I am not able to do/impossible to do. All the items on the scale are positive, and there are no reverse items. While lower scores indicate inadequate, problematic, and weak health literacy, higher scores indicate adequate and very good health literacy. Health literacy levels increase with the increase in the scores obtained from the scale. Cronbach's Alpha coefficient was 0.92 in the validity study (13). This study found Cronbach's Alpha value of the HLI total score as 0.950, and the Cronbach's Alpha values of the sub-scales were found to range between 0.844 and 0.906

The Health Practices in Pregnancy Scale (HPPS) was developed by Lindgren in 2005 (14). Er conducted the Turkish validity and reliability in 2006<sup>15</sup>. The scale consists of 33 items. Items between 1 and 16 are responded on a 5-point Likert scale with options ranging from "always" to "never". Items between 17 to 33 are also responded on a 5-option scale ranging from one to five. The overall score is obtained from the total score of all the items. The scores to be obtained from the scale range between 33 and

165. Higher scores indicate a higher level of health practices. Cronbach's Alpha coefficient was reported 0.74 in the validity study (15). This study found the Cronbach's Alpha value of the HPSS as 0.707.

The data were collected from the pregnant women in the polyclinic by the researcher through interviews conducted face-to-face. The process took approximately 10-15 minutes.

Statistical analyses were performed using IBM SPSS (Statistical Package of Social Sciences) program V25. Descriptive statistics were presented with median, minimum and maximum values, frequencies, and percentages. Whether the distribution of each variable in the dataset fit the normal distribution was tested, and the variables that did not distribute normally were analyzed by nonparametric tests. Mann Whitney U was used for the comparison of the differences between two independent groups, and the Kruskal Wallis H test was used for the comparison of three or more groups. Besides, Dunn's test was used for pairwise comparisons to determine the significant differences within groups. The Spearman Rho Correlation Analysis was performed to assess the correlation between the scale scores. In addition, the linear regression analysis-backward method was performed to examine the relationship between scale scores and independent variables. For each categorical variable, dummy (number of category-1) variables were created in the regression model and evaluations were made according to the reference category. The results were assessed with a 95% confidence interval.

Ethics committee approval was obtained from the Ethics Committee of Yildirim Beyazit University (2018-21), and written permission was obtained from the hospital where the study was conducted. An informed consent form was obtained from each participant. The purpose of the study was explained to the women participating in the study, and their written and signed Informed Consent Form was obtained.

## Results

Table 1 demonstrates participating pregnant women's socio-demographic and pregnancy-related characteristics and health practices.

**Table 1.** Socio-demographic characteristics of the pregnant women

Characteristics	Mean±SD	Median [Min-Max]
<b>Age</b>	27.4±5.4	26.5 [17-42]
<b>Marriage duration</b>	5.3±4.9	4.0 [1-23]
<b>Gestational week</b>	23.8±10.7	24.0 [1-40]
<b>Number of pregnancies</b>	1.9±1.0	2.0 [1-7]
<b>Number of children</b>	1.5±0.7	1.0 [0-4]
<b>Age</b>	<b>N (%)</b>	
19 and below	16 (4.3)	
20-29	236 (63.1)	
30-39	113 (30.2)	
40-49	9 (2.4)	
<b>Educational Level</b>		
Elementary/Secondary school	103 (27.6)	
High school	156 (41.7)	
University	115 (30.7)	
<b>Employment</b>		
Employed	83 (22.3)	
Unemployed	290 (77.7)	
<b>Social insurance</b>		
Yes	325 (86.9)	
No	49 (13.1)	
<b>Income Level</b>		
Low	9 (2.4)	
Moderate	197 (52.7)	
Good	168 (44.9)	
<b>Family type</b>		
Nuclear	325 (86.9)	
Extended	49 (13.1)	
<b>Place where women spent their childhood</b>		
City	279 (74.6)	
Town	23 (6.1)	
Village	72 (19.3)	
<b>Wanted pregnancy</b>		
Yes	344 (92.0)	
No	30 (8.0)	
<b>Perception of pregnancy</b>		
Physically uncomfortable	59	
Untimely	37	
Difficult and troublesome	120	
Joyous/easy	158	
<b>Medication compliance in pregnancy</b>		
Yes	253	
No	29	
Partial	92	
<b>Perception of health status</b>		
Quite good	54	
Good	213	
Moderate	98	
Poor	9	

Significant differences were detected between the HLI total median scores according to the educational level variable ( $p < 0.001$ )

(Table 2). Further analysis results showed that the difference was related to the group that graduated from university ( $p < 0.05$ ) (Table 2).



**Table 2.** Pregnant women's Health Literacy Index (HLI) and Health Practices in Pregnancy Scale (HPPS) mean scores according to their socio-demographic characteristics

Characteristics	Accessing Information	Understanding Information	Processing/ Appraising information	Applying/Using information	HLI	HPPS
	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]
<b>Age</b>						
19 and below	22[11-25]	29[8-35]	38,5[8-40]	22[5-25]	107[46-125]	85[54-108]
20-29	23[7-25]	31[10-35]	36[13-40]	23[5-25]	112[45-125]	98[47-119]
30-39	23[6-25]	30[13-35]	36[16-40]	21[5-25]	108[48-125]	98[72-125]
40-49	24[16-25]	31[29-33]	38[34-40]	24[21-25]	117[109-123]	104[87-123]
	KW= 5.291 p= 0.152	KW= 6.302 p= 0.098	KW= 4.715 p= 0.194	KW= 6.590 p= 0.086	KW= 5.701 p= 0.127	<b>KW= 13.501</b> <b>p= 0.004*</b>
<b>Educational level</b>						
Elementary/Secondary school	22[7-25]	28[8-35]	35[13-40]	21[5-25]	104[45-125]	93[49-119]
High school	23[6-25]	30[13-35]	36[8-40]	22[5-25]	110[46-125]	97[47-125]
University	24[11-25]	32[15-35]	37[17-40]	24[14-25]	117[68-125]	102[75-123]
	<b>KW= 25.096</b> <b>p&lt; 0.001*</b>	<b>KW= 25.185</b> <b>p&lt; 0.001*</b>	<b>KW= 14.846</b> <b>p= 0.001*</b>	<b>KW= 16.423</b> <b>p&lt; 0.001*</b>	<b>KW= 28.235</b> <b>p&lt; 0.001*</b>	<b>KW= 28.365</b> <b>p&lt; 0.001*</b>
<b>Employment</b>						
Employed	24[10-25]	31[14-35]	36[16-40]	22[5-25]	112[50-125]	101[47-122]
Unemployed	23[6-25]	31[8-35]	36[8-40]	22[5-25]	110[45-125]	97[49-125]
	U= -1.776 p= 0.076	U= -0.206 p= 0.837	U= -0.376 p= 0.707	U= -0.238 p= 0.812	U= -0.731 p= 0.465	U= -1.514 p= 0.130
<b>Perceived Income</b>						
Low	23[10-25]	32[14-35]	37[13-40]	23[13-25]	114[53-125]	101[90-116]
Moderate	22[6-25]	30[8-35]	35[16-40]	21[5-25]	108[47-125]	97[47-123]
Good	23[7-25]	31[10-35]	36[8-40]	23[5-25]	113[45-125]	100[68-125]
	<b>KW= 8.614</b> <b>p= 0.013*</b>	KW= 2.544 p= 0.280	KW= 3.049 p= 0.218	KW= 5.808 p= 0.055	KW= 5.981 p= 0.054	KW= 5.742 p= 0.057
<b>Family type</b>						
Nuclear	23[6-25]	31[8-35]	36[8-40]	22[5-25]	111[45-125]	99[47-125]
Extended	23[8-25]	31[11-35]	36[20-40]	23[5-25]	112[47-125]	96[49-114]
	U= -0.903 p= 0.926	U= -0.123 p= 0.902	U= -0.259 p= 0.796	U= -1.117 p= 0.264	U= -0.032 p= 0.974	U= -0.908 p= 0.364
<b>Place where they spent their childhood</b>						
City	23[6-25]	31[8-35]	36[8-40]	23[5-25]	112[46-125]	99[47-125]
Town	24[10-25]	31[14-35]	36[16-40]	23[13-25]	113[53-124]	101[59-122]
Village	22[7-25]	28[10-35]	35[14-40]	21[10-25]	107,5[45-125]	93,5[54-119]
	<b>KW= 9.715</b> <b>p= 0.008*</b>	<b>KW= 10.268</b> <b>p= 0.006*</b>	KW= 3.471 p= 0.176	<b>KW= 3.902</b> p= 0.142	<b>KW= 9.100</b> <b>p= 0.011*</b>	KW= 3.269 p= 0.195
<b>Gestational week</b>						
First Trimester	22,5[9-25]	31[14-35]	36[8-40]	21,5[5-25]	108,5[46-125]	98[61-119]
Second Trimester	23[6-25]	31[8-35]	36[16-40]	23[5-25]	113[47-125]	98[47-125]
Third Trimester	23[7-25]	30[10-35]	36[13-40]	22[5-25]	110[45-125]	98[50-120]
	KW= 0.425 p= 0.808	KW= 2.258 p= 0.323	KW= 0.087 p= 0.957	KW= 0.837 p= 0.658	KW= 1.016 p= 0.602	KW= 0.406 p= 0.816
<b>Number of pregnancies</b>						
Primipara	23[6-25]	31[8-35]	36[8-40]	22[5-25]	111[46-125]	98[47-120]
Multipara	23[7-25]	31[10-35]	36[14-40]	22[5-25]	111[45-125]	98[50-125]

Characteristics	Accessing Information	Understanding Information	Processing/ Appraising information	Applying/Using information	HLI	HPPS
	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]	$\bar{X}$ [Min – Max]
	U= -0.092 p= 0.927	U= -0.140 p= 0.889	U= -0.529 p= 0.597	U= -0.682 p= 0.495	U= -0.38 p= 0.970	U= -1.293 p= 0.196
<b>Perception of pregnancy</b>						
Physically uncomfortable	22[12-25]	30[14-35]	36[16-40]	21[10-25]	107[62-125]	95[59-119]
Untimely	23[8-25]	30[12-35]	34[20-40]	19[5-25]	106[47-125]	95[47-119]
Difficult and troublesome	22,5[7-25]	30[8-35]	36[14-40]	22[10-25]	110[45-125]	96[50-125]
Joyous/easy	23[6-25] KW= 3.241 p= 0.356	32[13-35] <b>KW= 9.531</b> <b>p= 0.023*</b>	37[8-40] KW= 6.753 p= 0.080	24[5-25] <b>KW= 16.467</b> <b>p= 0.001*</b>	114,5[46-125] <b>KW= 10.765</b> <b>p= 0.031*</b>	100,5[71-123] <b>KW= 8.867</b> <b>p= 0.035*</b>
<b>Wanting the pregnancy</b>						
Yes	23[6-25]	31[8-35]	36[8-40]	23[5-25]	112[45-125]	98[47-125]
No	23,5[8-25] U =-0.726 p=0.468	30[14-35] U =-1.006 p=0.314	34[16-40] U =-1.138 p=0.255	19[10-25] <b>U =-2.777</b> <b>p=0.007*</b>	108[62-125] U =-1.359 p=0.174	94[68-116] U =-0.909 p=0.364
<b>Behaviors demonstrated in case of a health problem</b>						
Ignoring	22[12-25]	30[14-35]	33,5[8-40]	20[5-25]	108[46-121]	90[47-116]
Trying self-treatment	22[8-25]	30[14-35]	35[16-40]	22[5-25]	108[50-125]	97,5[50-120]
Seeing a doctor	23[6-25] KW=4.167 p=0.125	31[8-35] KW=1.772 p=0.412	36[13-40] <b>KW=7.429</b> <b>p=0.024*</b>	23[5-25] <b>KW=10.343</b> <b>p=0.006*</b>	112[45-125] <b>KW= 6.858</b> <b>p 0.032*</b>	99[49-125] <b>KW= 8.022</b> <b>p= 0.018*</b>

$\bar{x}$ : Median, U: Mann Whitney U Test, KW: Kruskal Wallis H Test,  $p < 0,05$ : Significance level

A significant difference was detected between the HLI total median scores according to the place where participating pregnant women spent their childhood ( $p$ : 0,011). Further analysis results showed that the difference was related to the group that lived in the village ( $p < 0,05$ ) (Table 2). A significant difference was found between pregnancy perception and the HLI total median scores ( $p$ = 0,031). Further analysis results showed that the difference was related to the group that perceived their pregnancy as joyous/easy ( $p < 0,05$ ) (Table 2). A significant difference was found between the HLI total median scores according to behaviors demonstrated in case of a health problem ( $p$  =0,032). Further analysis results showed that the difference was related to the group that saw a doctor ( $p < 0,05$ ) (Table 2).

A significant difference was detected between the HPPS median scores according to pregnant women's age groups (Table 2). Further analysis results showed that the difference was related

to the group aged 19 and below ( $p < 0,05$ ) (Table 2). The HPPS total median scores demonstrated a significant difference according to the educational level ( $p < 0,001$ ).

Further analysis showed that the difference was related to the group that graduated from university ( $p < 0,05$ ) (Table 2). A significant difference was found in the HPPS total median scores according to perception of pregnancy ( $p$ :0,035). Further analysis results showed that the difference was related to the group that perceived pregnancy joyous/easy ( $p < 0,05$ ) (Table 2). HPPS total median scores demonstrated significant differences according to behaviors demonstrated in case of a health problem ( $p$ :0,018). Further analysis results showed that the difference in terms of the HLI and HPPS total scores was related to the group that saw a doctor ( $p < 0,05$ ) (Table 2).

While pregnant women's HLI total median score was found 111[45-125], HPPS total median score was found 98 [47-125] (Table 3). HLI sub-scale median scores are demonstrated in Table 3.

When the HLI and HPPS correlations were analyzed, a positive and significant relationship

was found between the HLI and HPPS sub-scales and total scores ( $p < 0.05$ ).

**Table 3.** Pregnant women's Health Literacy Index (HLI) and Health Practices in Pregnancy Scale mean scores (HPPS)

Scale and Sub-scales	$\bar{X} \pm SD$	$\bar{X}$ [Min – Max]
Accessing Information	21.4±4	23[6-25]
Understanding the Information	29±5.7	31[8-35]
Processing/appraising information	33.6±6.6	36[8-40]
Applying/using information	21.1±4.3	22[5-25]
Total scale score	105.1±18.1	111[45-125]
Total HPPS score	96.6±12.7	98[47-125]

$\bar{X}$ : Mean,  $\bar{X}$ : Median, SD: Standard Deviation

**Table 4.** Regression model for HPPS and HLI, Backward Method

HPPS Backward Method	Unstandardized Coefficients		t	p value	95,0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
Constant	81.442	3.221	25.286	<0.001	75.108	87.775
Age 20-29	10.030	3.059	3.279	0.001	4.014	16.046
Age 30-39	12.346	3.169	3.896	<0.001	6.114	18.578
Age 40+	21.157	4.915	4.305	<0.001	11.493	30.822
Educational level high school	3.863	1.511	2.556	0.011	0.891	6.834
Educational level university	8.034	1.636	4.909	<0.001	4.816	11.252
Perception of pregnancy Joyous/easy	4.043	1.253	3.226	0.001	1.578	6.507
Income level moderate	-2.330	1.247	-1.869	0.062	-4.781	0.121
R <sup>2</sup> =0.144, F <sub>model</sub> =9.943, p <sub>model</sub> <0.001, p<0.05 Significance level						
Backward Model SO	Unstandardized Coefficients		t	p value	95,0% Confidence Interval for B	
	B	Std. Error			Lower Bound	Upper Bound
Constant	96.238	2.154	44.688	<0.001	92.003	100.473
Age 40+	13.285	5.889	2.256	0.025	1.704	24.866
Perception of pregnancy untimely	-5.754	3.020	-1.905	0.058	-11.692	0.184
Place where they spent their childhood city	3.812	2.110	1.807	0.072	-0.336	7.960
Educational level high school	6.041	2.251	2.684	0.008	1.615	10.468
Educational level university	12.170	2.407	5.057	<0.001	7.438	16.903
R <sup>2</sup> =0.084, F <sub>model</sub> =7.816, p <sub>model</sub> <0.001, p<0.05 Significance level						

When the Backward Regression analysis results were analyzed in terms of participating pregnant women's health literacy in pregnancy scores, women aged 40 and over were found to

have 13.285 units' higher mean scores in comparison to the reference group (women aged 19 and below). In comparison to the reference group (secondary school and below),

women who graduated from high school and university had 6.041 and 12.170 units' higher mean scores, respectively (Table 4).

According to the regression analysis of the factors affecting health practices in pregnancy, the mean scores were 10.030 units higher in the women in the 20-29 age group, 12.346 units higher in the 30-39 age group, and 21.157 units higher in the 40+ age group in comparison to the reference group (women aged 19 and below) (Table 4). The mean scores were 3.863 units higher in women who graduated from high school, 8.034 units higher in women who graduated from university in comparison to the reference group (women who had an educational level of secondary school and below). Besides, the mean scores of the pregnant women who had a joyous and easy pregnancy were found to be 4.043 units higher in comparison to the pregnant women who had a difficult and troublesome pregnancy.

## Discussion

This study, which aims to assess the relationship between health literacy and health practices and their influencing factors, found that participating pregnant women had a good health literacy level. Akça et al. (2020) also found that the pregnant women had good health literacy levels (18). Kohan et al. (2007) reported that only 18% of the women in their study group had good health literacy levels (19). The same study reported that those who demonstrated positive healthcare behaviors had good health literacy levels, and 60% of those who demonstrated negative healthcare behaviors had low health literacy levels. Mojuyinola (2011) started that the mother's health literacy level in pregnancy was associated with healthy pregnancy (11). Filiz (2015) reported that the pregnant women in the study group had low health literacy levels (20). The potential reason for the good health literacy level in the present study is that it was conducted in a metropolitan city, which is also the capital city. The study was conducted in the city center, which is another positive factor associated with the higher educational level in comparison to the average educational level in Turkey.

This study found that health literacy levels increased with the educational level. The

literature also includes studies indicating that the health literacy level increases with the increase in pregnant women's educational level (21-22). Education affects the health literacy level, which is an important finding and indicates the importance of taking measures for increasing the health literacy level of pregnant women with low educational levels so that they can demonstrate correct health behaviors.

Pregnant women's literacy level was found to be affected by the place where they spent their childhood. Pregnant women who lived in a village were found to have lower health literacy levels compared to the women who lived in cities and towns. Health behaviors are affected by the habits of society where individuals live, socio-cultural features of the individual, health literacy level, and many other factors. The literature also reports that living in a city center for a long time is associated with the adequate health literacy level (18,32). The study conducted by Özcan and Beji (2015) reported that the pregnant women who lived in the city center had better health practices in pregnancy in comparison to pregnant women who lived in a village (4). This finding indicates the need for taking measures for increasing the health literacy levels of pregnant women living in rural areas.

This study found that the health literacy level varied depending on having a planned pregnancy or not, and pregnant women who perceived pregnancy as joyous and easy had high health literacy levels. This result is supported by the regression analysis in this study. The process of being a mother requires intensive psychological, social, and physical preparation (33). Having a planned pregnancy leads to positive health practices and enables the pregnant woman to improve her health literacy level so that she can improve both her and the baby's health. Having a planned pregnancy affects how the pregnant woman perceives her body (34). Women who want and plan their pregnancy are known to take care of themselves more and have fewer negative experiences (35). The study conducted by Filiz (2015) also reported a positive correlation between health perception and health literacy (32). Aydın and Aba (2019) also stated that

those who had a planned pregnancy had significantly higher health literacy levels.

Participating pregnant women who saw a doctor when they had a health problem were found to have high health literacy levels. This result is supported by the regression analysis in this study. Health literacy is the level of an individual's capacity in understanding and processing health information and services to be able to make proper and correct health decisions. In addition to enabling individuals to have a say in and responsibility for their own health, health literacy is also important for the more effective and correct use of health services (11-16). Knowing about the health needs and seeking appropriate services to meet these needs are directly associated with an individual's health literacy level (8). Insufficient health literacy causes negative conditions such as insufficiency in using health services and an increase in the risk of catching a disease. Mojuyinola (2011) detected a significant relationship among maternal health literacy and receiving antenatal care and having a healthy pregnancy (6). Nawabi et al (2021) reported that pregnant women who had low health literacy levels understood the screening test in pregnancy less than those who had high health literacy levels (8). This result indicates that a pregnant woman who decides to see a doctor is also aware of her health care need, and her receiving healthcare service is improved. This result is also parallel to the results indicating that health literacy level affects health-related preferences and behaviors.

This study found that pregnant women's health practices were above-average. Akça et al. (2020) reported that pregnant women had high levels of health practices. Özcan and Beji (2015) and Er (2006) also reported that pregnant women had a good health practice level. Health behaviors demonstrated during the pregnancy period are important. The above-average level of health practices detected in this study is considered to be a pleasing finding.

This study found that health practices were affected negatively by the decrease in pregnant women's age. Health practices of the pregnant women aged 19 and below were found to be inadequate compared to other age groups. This result is supported by the regression analysis in

this study. Özcan and Beji (2015) found that health practices in pregnancy were affected positively by the increase in age (4). Pirdal et al. (2016) stated that knowledge level increased with the increase in the average age (17). This result could be associated with the lower educational level due to younger age.

Pregnant women's health practices were found to increase with the increase in their educational level, and the health practices of pregnant women who graduated from university were found to be better in comparison to other groups. The regression analysis results also support this finding. The literature indicates that educational level affects health practices in important ways (20,23). Uzun et al. (2017) reported that women with high educational levels had better adaptation to pregnancy (24), and Onat and Aba (2014) stated that pregnant women with low educational levels were at risk in terms of unhealthy behaviors (25). Zhao et al. (2009) similarly reported that the educational level was associated with health practices<sup>26</sup>. Other studies in the literature also found that high educational levels were associated with adequate health literacy levels (27-28).

This study found that pregnancy perception affected health practices in pregnancy. Particularly perceiving pregnancy as 'joyous and easy' led to better health practices, which is a finding supported by the regression analysis results as well. Although pregnancy and birth are physiological processes, they require adaptation. Pregnant women who had positive emotions about their pregnancy and fetus were reported to tend to have interventions to improve their health practices, and those who had negative emotions about pregnancy were less careful about their health practices (30). While some women perceive pregnancy as a pleasing condition, some others perceive it as something that causes worry, anxiety, and stress. People's perceptions affect their health behaviors (31-32). Women who had poor pregnancy perceptions had lower adaptation to pregnancy and motherhood and demonstrated negative health behaviors in pregnancy. Studies reported a positive relationship between mothers' health behaviors and pregnancy



perceptions (33-34). The results are in line with the literature.

This study found that pregnant women who saw a doctor when they had a health problem also had higher health practices, which was supported by the regression analysis as well. To improve their health and maintain their good health, individuals need to access, understand and use health-related information, which is closely associated with having adequate levels of health practices (35-36). Pregnant women who had four or more prenatal follow-ups were reported to have better health practices in comparison to women who had less frequent follow-ups (37). This study found that pregnant women who decided to see a doctor were aware of their health needs, and their receiving healthcare service was improved. Those who did not need to see a doctor or ignored their health problems had inadequate health practices. This result indicates that an individual's health practices affected the use and efficiency of health services. This study found that pregnant women's health practices increased with the increase in their health literacy levels. Pregnant women's health practices are reported to be an indicator of the health status of pregnant women and their babies in the pregnancy, birth, and postpartum periods (16,39). Maternal health literacy level is highly important in terms of community health care (28-29). The literature reports that low health literacy levels prevent individuals from accessing accurate information and services, benefitting from these services, using the sources available correctly, and becoming competent about their own health (21-22). Studies report that the health literacy levels affected breastfeeding rates, choosing effective family planning, and receiving antenatal care (38-39). It is reported that unhealthy behaviors are associated with low health literacy levels and risky behaviors are associated with poor health conditions and increased hospital treatments and expenses (40-41). This result shows that pregnant women's health literacy levels have important effects on their health practices.

The lack of studies that evaluate both health literacy and health practices in pregnancy using scales constitutes the strong aspect of this study.

However, it was a cross-sectional type of research, that it only enrolled women who attended a hospital and that the scales applied here cannot be used to make a definitive diagnosis are important limitations. More comprehensive studies are needed to reveal the relationship between the health literacy levels of pregnant women and health practices in pregnancy and their affecting factors.

## Conclusion

This study showed that the pregnant women had a good health literacy level and an above-average health practice level; many variables affected health literacy and health practices in pregnancy. Besides, pregnant women's health practices increased with the increase in their health literacy levels.

These results indicate the importance for healthcare professionals providing health services to also recognize the socio-demographic characteristics that have the potential to cause differences in health practices and health literacy levels in pregnancy. While focusing on the physiological and biological changes, one should not overlook health literacy levels, and particularly the risk groups with low health literacy levels should be evaluated more carefully. Health literacy is considered to be an important step for pregnant women to have a healthy pregnancy. In this regard, evaluation of pregnant women's health literacy levels is considered to be among the duties of nurses as health professionals so that pregnant women's health can be protected and enhanced. Particularly within the scope of nurses' health education and consultancy roles, starting from pre-conceptual periods, mothers' health literacy levels should be assessed; the results are believed to contribute to the improvement of health.

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## Conflicts of interest

Authors declared no conflicts of interest.

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