

Original Research Article

Determination of the effect of internet use and e-health literacy on birth worries in pregnant women

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ABSTRACT

Background: This study was carried out to determine the relationship between the internet use of pregnant women and e-health literacy and birth anxiety.

Methods: This descriptive study was conducted 313 pregnant Turkish woman in Ankara Turkey, from May 2018 to December 2018. The Introductory Information and internet usage e-health literacy scale (E-HLS) and the Oxford worries about labor scale (OWLS) used to measure participants' birth anxiety and e-health literacy. To evaluate data that were not normally distributed, additional descriptive statistics, the Mann-Whitney U test, the Kruskal-Wallis analysis test and Pearson correlation analysis were employed.

Results: The (E-HLS) scale and the (OWLS) scale and median scores were 29.31 ± 6.34 and 24.59 ± 7.44 , respectively. The majority of pregnant women had access to the internet, and had access to internet for the information given by the health care provider is not clear. Fetal development and nutrition delivery were the two most often mentioned topics of interest. We detected statistically significant relationships between Internet usage during pregnancy and income and education status ($p < 0.05$). A moderately positive and statistically significant relationship was detected between e-health literacy and Oxford birth anxiety total score.

Conclusions: During antenatal visits and childbirth education classes, health professionals should help increase the e-health literacy of pregnant women, including the abilities to search, understand, and evaluate health information from electronic sources.

Keywords: E-health, Information, Internet, Pregnant women, Worry

INTRODUCTION

Worldwide and in Turkey, people are increasingly using the internet.¹ Today, the internet is the most widely used source of information for many subjects.² In parallel with this, the internet has become a part of our life as the most important communication source. This situation has been effective in the field of health, providing individuals with quick and easy access to information.^{3,4} Because of this, the internet has become one of the most important sources of health information. Sociodemographic characteristics,

such as age, gender, income, and education level, play an important role in researching health on the Internet.⁵ It has been reported that the rates of using the Internet for health-related subjects are higher.^{6,7} Many studies show that almost all women use the Internet intensively during pregnancy.⁸⁻¹¹

A study conducted in Sweden reported that 91% of pregnant women had internet access. It was observed that pregnant women who use the internet generally gather information in the early stages of pregnancy. Also, it was

determined that pregnant women mostly searched for pregnancy-related issues before going to the health professional, and after the interview was completed.¹²⁻¹⁴ The subjects most investigated by pregnant women are fetal development, feeding during pregnancy, pregnancy complications, stages of labor, birth pain and birth pain, birth stories of women who gave birth, sites selling baby and breastfeeding products, and forums.^{10,15,16} However, it is seen that most women do not discuss the information they received on the Internet with health professionals.¹⁶

Pregnancy is a special and important period in which several physiological and psychological changes occur.^{17,18} Although pregnancy is a natural phenomenon, pregnancy care, medical monitoring, and prenatal testing often raise fears and worries about the pregnancy and childbirth process.^{19,20} The reasons for such fear and anxiety during pregnancy vary. These fears and worries are related to the risk of baby death or damage, birth pain, death and panicking, health staff competency, and believing themselves incapable of giving birth.^{20,21} Worries were also related to previous pregnancy and birth experiences, knowledge about the delivery process, becoming educated about labor and birth, having support at birth, and increasing the anxiety of environmental factors.²² In the literature, it has been found that the Internet is widely used in information research to reduce these fears and worries about women's pregnancies.^{16,23} However, it is known that not all of this information is correct.¹¹

Although health literacy is a relatively new concept in health promotion, it is necessary to understand the importance of e-health literacy in health promotion.²⁴ Using information technology for health requires e-health literacy. For e-health literacy, reading, computer use, knowledge search, and the ability to understand and apply health information are required.²⁵ Therefore, e-health literacy is important for pregnant women to be able to access health information via the internet. E-health literacy might also help to reduce birth anxiety. To our knowledge, no study has investigated the relationship between e-health literacy and birth anxiety. To address this, here we have determined the relationship between the internet use habits of pregnant women, e-health literacy, and birth anxiety.

METHODS

Design and sampling

This descriptive and cross-sectional study was conducted between March 2018 and December 2018. The population for the study included pregnant women who came to the outpatient antenatal clinic for follow-up during this period to Etlik Zubeyde Hanım Gynecology Training and Research Hospital, Ankara, Turkey. The study sample used random sampling, a sample size alpha error of 5%, and a confidence interval of 95%. Our power analyses estimated that 313 participants were necessary.²⁶ Volunteering to participate in the study and being able to

communicate in Turkish were the inclusion criteria. Three-hundred-thirteen pregnant women who met these criteria were reached, and the study was completed. The response rate of the questionnaires was 100% (n=313).

Instruments

The data collection tools were the Introductory Information and internet usage e-health literacy scale (E-HLS) and the Oxford worries about labor scale (OWLS). An 18-item, Introductory Information and Internet Usage questionnaire was formulated after a thorough review of the relevant literature.^{16,20,27} The questionnaire consisted of personal information questions (age, educational level, profession) and questions on the use of the internet.

E-health literacy scale (E-HLS)

Developed by Norman and Skinner and adapted to Turkish by Gencer, the e-health scale is an 8-item measure of e-health literacy developed to measure the common knowledge, comfort, and perceived skills of individuals in finding, evaluating, and applying electronic health information on health problems. E-HLS is a 5-point Likert-type scale (from 1 = strongly disagree and 5 = completely agree). The minimum and maximum possible scores on the E-HLS are 8 and 40, respectively.^{25,28}

Oxford worries about labour scale (OWLS)

Redshaw et al. demonstrated the validity of the Turkish form developed by Aksoy et al. It is a psychometrically developed measurement tool to assess women's concerns about birth and labor. Women's concerns about the birth process were evaluated with a four-point Likert scale. Scale can be applied to women in all periods before, during, and after prenatal, and was scored as; "1, I was so worried"; "2, I was pretty worried"; "3, I was not too worried", and "4, No, I was not worried". The scale is evaluated using the total score (min = 10, max = 40). The higher the score, the lower the level of women's anxiety.^{29,30}

Data collection procedure and ethical considerations

The purpose of the study was explained to the pregnant women who participated in the study, and the importance of reliable internet usage in pregnancy was emphasized. Only pregnant women who were volunteers were included in the study, and their verbal and written informed consent was obtained. The data collection was within approximately 10 minutes.

Data analysis

The study was conducted using the Statistical Package for Social Sciences (IBM SPSS Statistics 19; SPSS Inc, Chicago, Illinois). Descriptive statistics were used to assess data on demographics and research factors. The

Kruskal-Wallis analysis test and the Mann-Whitney U test were employed to evaluate the non-normally distributed data and Pearson Correlation analysis were used. It was deemed statistically significant when $p < 0.05$.

RESULTS

The mean age was 28.1 ± 5.1 (minimum, 19; maximum, 43). Most (79.3%) of the pregnant women were under the age of 33, and 91.4% had a nuclear family. Most (58.8%) of the pregnant women did not work, and 39.3% were university graduates. More than half (55%) of the participants stated their income status as good, and 62.3% did not receive a pregnancy-related education from a health institution (Table 1).

In this study, 78.6% of pregnant women reported that they used the internet during their pregnancy, and 71.6% stated that it was easy to reach information on the internet. We found that pregnant women use the Internet to search for information on various topics during their pregnancy; the most frequently searched subjects were baby development (67.4%), birth (38%), pregnancy (36.7%), in pregnancy (16%), in infant care (14.1%), in the puerperium (5.8%). In addition to the information provided by the health care professional, 67.4% of the

pregnant women and 64.9% of the health care professionals were not satisfied with the information given by the health care professional, and 61% of them showed that they were not satisfied with the information given by the health care provider and that they needed to search for information from the internet. Also, 65.2% of pregnant women stated that health experts do not have sufficient time to answer their questions, and 56.2% said that they needed to search for information from the internet. Among the participants, 41.9% stated that they used the internet as a source of information, rather than visiting a health professional (e.g., midwife, nurse, doctor). Most (56.5%) of the pregnant women stated that they needed to search for information on the Internet to have control in decisions that affect their pregnancy (Table 2).

We detected a statistically significant difference between Internet usage status during pregnancy and income and education status ($p < 0.05$). Also, it was observed that those who did not have health education in pregnancy used the internet more than those who received health education ($p < 0.05$). No statistically significant difference was found between age and family structure with internet usage in pregnancy ($p > 0.05$) (Table 3).

Table 1: The socio-demographic characteristics of the pregnant women.

Variables	Number	Percent
Age group (years)		
19-26	137	43.8
27-32	111	35.5
33-38	54	17.3
≥ 38	11	3.5
Family structure		
Nuclear family	286	91.4
Extended family	27	8.6
Working status		
Working	129	41.2
Not working	184	58.8
Education status		
Primary school	34	10.9
Middle school	47	15.0
High school	109	34.8
University and above	123	39.3
Income status		
Bad	13	4.1
Middle	128	40.9
Good and very good	172	55
Getting a health education authority from about pregnancy		
Yes	118	37.7
No	195	62.3

Table 2: The general internet habits of the participants.

Variables	Number	Percentage (%)
Internet usage status during pregnancy		
Yes	246	78.6
No	67	21.4
Difficulty in accessing information on the internet		
Easy	224	71.6
Difficult	64	20.4
I do not know	25	8.0
How often do you use the internet for the information you need		
Always	205	65.5
Sometimes	80	25.6
Never	28	8.9
What did you need to research about during your pregnancy?*		
Baby's development		
Yes	211	67.4
No	102	32.6
Nutrition in pregnancy		
Yes	115	36.7
No	198	63.3
Baby care		
Yes	44	14.1
No	269	85.9
Exercise during pregnancy		
Yes	50	16.0
No	263	84.0
Birth		
Yes	119	38.0
No	194	62.0
Postpartum		
Yes	18	5.8
No	295	94.2
Reasons why pregnant women need information from the internet		
In addition to the information provided by the healthcare professional		
Yes	211	67.4
No	102	32.6
The information given by the health care provider is not clear		
Yes	203	64.9
No	110	35.1
Not satisfied with the information given by the health professional		
Yes	191	61.0
No	122	39.0
Health professionals don't have enough time to answer my questions		
Yes	204	65.2
No	109	34.8
Beware of asking a healthcare professional		
Yes	176	56.2
No	137	43.8
Have control over decisions that affect my pregnancy		
Yes	177	56.5
No	136	43.5
When did you feel like searching for information on pregnancy		
Before going to pregnancy control	131	41.9
After going to pregnancy control	70	22.4
For my own need without a prenatal visit	17	5.4
Instead of visiting a midwife, nurse or doctor	95	30.4

*More than one item could be indicated.

Table 3: Relationships between the characteristics of pregnant women with their internet habits.

Variables	Internet use in pregnancy				Test statistics	
	Yes		No		P value	χ^2
	N	%	N	%		
Age (years)						
19-26	98	39.8	39	58.2	0.21	9.752
27-32	90	36.6	21	31.3		
33-38	47	19.1	7	10.4		
≥38	11	4.5	0	0.0		
Family structure						
Nuclear family	225	78.7	61	21.3	0.012	0.914*
Extended family	21	77.8	6	22.2		
Income status						
Bad	2	0.8	11	16.4	0.001	50.696*
Middle	89	36.2	39	58.2		
Good+very good	155	63.0	17	25.4		
Working status						
Working	118	48.0	11	16.4	0.001	21.634*
Not working	128	52.0	56	83.6		
Education status						
Primary school	23	9.3	11	16.4	0.001	52.321*
Middle school	24	9.8	23	34.3		
High school	79	32.1	30	27.5		
University and above	120	48.8	3	4.5		
Health education in pregnancy						
Training	109	44.3	9	13.4	0.001	21.374*
Education	137	55.7	58	86.6		

*Mann-Whitney U test.

Table 4: Relationships between the characteristics of the pregnant women and their mean e-health literacy scale scores.

E-health literacy (n=313)	N	Mean±SD	Descriptive statistic		
			Z	P value	χ ²
Internet use in pregnancy					
Yes	246	30.36±5.6	4.8*	0.001	
No	67	25.4±7.3			
Education about pregnancy					
Yes	115	32.1±8.0	6.9*	0.001	
No	198	24.4±6.7			
Working status			6.4*	0.001	
Yes	118	33.7±2.3			
No	13	22.5±8.4			
Education status					
Primary school	34	29.0±7.3		0.070	5.314**
Middle school	47	27.2±5.5			
High school	109	26.4±6.4			
University and above	123	32.7±4.2			
Age					
19-26 age	137	27.8±6.4		0.001	21,227**
27-32 age	111	30.7±5.9			
33-38 age	54	30.7±6.1			
38 and above	11	26.3±4.7			

*Mann-Whitney U test; **Kruskal-Wallis test; ***p<0.05

Table 5: Relationships between the characteristics of the pregnant women and their Oxford worries about labour scale scores.

The Oxford worries about labour scale (n=313)	Descriptive statistic		Z	P value	χ^2
	N	Mean±SD			
Internet use in pregnancy					
Yes	246	22±8.1	3.4*	0.001	
No	67	30.1±8.0			
Education about pregnancy					
Yes	115	23.3±14.4	6.1*	0.001	
No	198	21.5±5.8			
Working statements					
Yes	129	33.7±2.3	6.4*	0.001	
No	184	22.5±8.4			
Education status					
Primary school	34	23.8±8.1		0.454	1.581**
Middle school	47	21.6±6.7			
High school	109	22.7±6.2			
Universtiy and above	123	27.5±7.5			
Age					
19-26 age	137	27.8±6.4		0.029	9.011**
27-32 age	111	30.7±5.9			
33-38 age	54	30.7±6.1			
38 and above	11	26.3±4.7			

*Mann-Whitney U test; **Kruskal-Wallis test; ***p<0.05

The validity of the E-HLS Turkish validity study was calculated as Cronbach's alpha =0.886. In our study, this value was found to be 0.902, and it was found that the scale had a high-reliability value. The mean total E-HLS score for pregnant women was found to be 29.31±6.34. A statistically significant difference was found between the Internet use status of pregnant women and e-health literacy scores (p=0.001). Also, there was a statistically significant difference between E-HLS score averages in pregnancy, study status, education level, and age in pregnancy (p=0.001) (Table 4).

The reliability coefficient of the Turkish OWLS was $\alpha=0.83$. In this study, the reliability coefficient was calculated as $\alpha=0.82$. The mean total score of pregnant women was 24.59±7.44. There was a statistically significant relationship between the mean scores of the pregnant women and the use of internet in pregnancy, getting an education during pregnancy, and working status (p=0.001). However, no statistically significant difference was found between age and education level (p>0.05) (Table 5). In our study, a moderate positive relationship was detected between e-health literacy and the Oxford birth anxiety total score of pregnant women, and this relationship was statistically significant (r=0.512; p=0.001).

DISCUSSION

In the twenty-first century, the number of internet users has increased worldwide, and in Turkey.⁹ Rate of 72.9%

of internet users in Turkey in 2018 arose.³¹ In this study, 78.6% of pregnant women stated that they use the internet to access information. Bjelke et al and Hadimli et al reported the rate of internet use during pregnancy as 95% and 96.3% respectively. Lima-Pereira et al reported that the rate of internet use among pregnant women is 98%.⁸ The findings of our study are consistent with previous studies and confirm that women use the Internet as a source of information during their pregnancy. Also, in this study, the subjects of interest to the pregnant women were investigated and could be ranked as infant development (most interest), birth, and nutrition in pregnancy. Larsson reported that infant development was of most interest to pregnant women (59%).¹⁰ Kavlak et al reported that 81% of the pregnant women in the Izmir region searched the internet for information, and they searched for information about baby development.¹¹ Also, Gao et al have shown that 57% of Chinese pregnant women use the Internet to search for information about infant development.¹² However, in some studies, it was stated that pregnant women search the internet for complications related to pregnancy.^{32,33}

Hadimli et al showed that 69.2% did not have the opportunity to talk to professionals because of the reason of not consulting the health personnel of pregnant women. Similar results have been obtained in the literature and in this study.⁵

Diaz investigated Internet use in pregnancy and the sociodemographic characteristics of those with university

graduates and those with high-income status and reported significant relationships.³⁴ Kavlak et al stated that those who have a high level of education and working with pregnant women use the internet more frequently.¹¹ Gao et al found a surprisingly high level of education among those who frequently use the Internet during pregnancy.¹² This study is similar to the literature, and there was a statistically significant difference between the higher education levels of the university and the higher education and those with high-income levels. However, Larson did not find a significant difference between the level of education and internet use in pregnancy.¹⁰ Although the results of our study show that internet use is greater among high income and highly educated pregnant women, it has also become an accessible technology for low and middle-income groups. For this reason, we propose that healthcare professionals will be able to benefit from training in the appropriate use of the internet by pregnant women.

Today, the Internet has become one of the main sources used in accessing health information, even without the need for a health professional.³⁵ The fact that the information on the Internet is accurate, reliable, and usable is of great importance in terms of pregnant health. Studies on health information in mass media also reveal that health messages in these environments are generally inaccurate, improperly transmitted, or inappropriate role models.⁵

The importance of e-health literacy has increased with the increasing use of the internet to obtain health information.³⁶ The concept of e-health literacy is defined as the ability to search, understand, and evaluate health information from electronic sources and apply the acquired health information to solve health problems.³⁷ To benefit from the rich health information that can be obtained electronically, a new concept of e-health literacy is needed, and scales have been developed to determine e-health literacy level.^{25,36} A high score in the e-health literacy scale is interpreted as the ability of individuals to have information about and use electronic resources.²⁵ According to the findings of this study, it can be said that pregnant women have a good perception of e-health literacy (mean e-health literacy scale scores of 29.3 ± 6.34). In the study, we found that the total e-health literacy scores of internet users during pregnancy was high, and a statistically significant difference was found. Also, the mean scores of the employees, those who did not receive pregnancy training during pregnancy, and the pregnant women between the ages of 27-38 years were high but were found to be significant.

Birth is a very deep and powerful experience. While most of the pregnant women feel proud and successful, this situation can cause anxiety in some pregnant women.³⁸ In our study, the Oxford birth worry scale was used to measure the concerns of pregnant women about childbirth. The increase in the total score of the scale shows that the level of birth anxiety is low. According to

our findings, the total scale score of pregnant women (24.5 ± 7.44) was moderate. When comparing the average scores of the Oxford birth anxiety scale of the pregnant women, the total score of the users who use the internet to search for information was significantly lower than those who did not use the internet. These results suggest that information about the pregnancies obtained by the pregnant women increased their anxiety about the birth. Also, it was observed that pregnant women who were not educated by a pregnancy-oriented institution have higher birth anxiety. Based on these findings, receiving birth-related health education is an important factor for decreasing birth anxiety among pregnant women. The findings of our study show that the increase in e-health literacy score led to an increase in the birth anxiety score. However, this increase is reflected positively. High birth anxiety score is interpreted as a low level of anxiety of pregnant women.

This study has some limitations. It was conducted in a region of Turkey and, therefore, it cannot provide a sufficient basis for making generalizations to other regions or countries. Further studies are needed to generalize the results. The data are based on the subjective opinions of the participants. In this study, it was not questioned which part of the pregnancy and the pregnancy of the participants. Another limitation is the limited number of available studies evaluating the attitudes of pregnant women towards e-health literacy and birth concerns. Further studies need to be done in a larger sample and taking into account the above limitations.

CONCLUSION

In Turkey, as all over the world, the internet has become an important tool. Today, many people see the internet as an important source of information for health and disease. According to the results of our study and literature, pregnant women frequently use the Internet to access information during pregnancy. Also, our findings show that pregnant women have good e-health literacy perception and decreased anxiety about birth. Health professionals play an important role in providing reliable information to help pregnant women maintain a healthy pregnancy and reduce their anxiety of birth. Health professionals should, therefore, not only provide information about pregnancy during prenatal visits but also guide pregnant women in how to use the Internet to access reliable sources. In addition to this, discussion times should be created to determine the accuracy of the information obtained by pregnant women.

In light of the data obtained in this study, in future work it will be important to determine the number of past pregnancies of the pregnant women, the websites they visit frequently, the websites they find reliable, and whether they consulted health professionals about these websites. Also, we recommend that the e-health literacy scale of future studies should be done by using pregnant women in different cultures.

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