THE RELATIONSHIP BETWEEN E-HEALTH LITERACY AND CYBERCHONDRIA SEVERITY WITH PARTICIPATION IN CERVICAL CANCER SCREENING

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Abstract

Objectives: The spread of technology and the internet in society has not only been apparent in the information and communication sectors but has also affected all fields. One of the active areas where the Internet is used is in healthcare. This study aims to investigate the relationship between women's online health information-seeking behavior, e-health literacy levels, and cyberchondria severity levels with cervical cancer screening.

Materials and Methods: This research, conducted using a quantitative correlational screening model and a cross-sectional method, involved face-to-face interviews with 370 women aged 30 to 65, who applied to a gynecology clinic in Ankara City Hospital. A four-part questionnaire was used, which included women's sociodemographic data, questions aimed at understanding online health information-seeking behavior, the e-Health Literacy Scale (eHEALS), and the Short Form Version of the Cyberchondria Severity Scale (CSS-12).

Results: A low positive correlation was found between participants' e-health literacy and cyberchondria scale scores. However, no significant relationship was observed between online health information-seeking behavior, e-health literacy, cyberchondria severity levels, and participation in screenings.

Conclusion: In this study, it was observed that despite high rates of online health information-seeking behavior among women, it is not sufficient to encourage cervical cancer screenings.

Keywords: Cervical cancer screening, e-health literacy, cyberchondria

Introduction

According to data from the World Health Organization (WHO), in 2020 cervical cancer was the fourth most common cancer among women worldwide and 90% of deaths related to cervical cancer occurred in low and middle-income countries.[1] It has been reported that the incidence and mortality of cervical cancer in high-income countries over the last 30 years have decreased by more than half with the use of official screening programs.[2]

Cervical cancer screening programs are of utmost importance in reducing the incidence and mortality rates of cancer. Screening aims to accurately detect and treat intraepithelial precursor lesions of the cervix on time, to prevent cervical cancer. The long pre-invasive period of cervical cancer and the effectiveness of treating pre-invasive lesions increase the importance of cervical cancer screening. The highest rates of cervical cancer incidence and mortality are in low- and middle-income countries. This reflects major inequities driven by a lack of access to national HPV vaccination, cervical screening and treatment services, and social and economic determinants.[1] It is generally observed that countries with a high incidence of cervical cancer also have insufficient screening programs.[1,2]

Individuals need to acquire knowledge about health to preserve personal health, understand disease diagnosis, assess risks and treatment options, and prevent diseases. Health information-seeking behavior (HISB) is defined as "an individual's active or purposeful behavior to obtain objective information related to health".[3] For this purpose, various tools, such as consulting healthcare professionals, printed materials, social surroundings, the internet, and media are used.[4] With the widespread adoption of information and communication technology, the internet has become an important source that individuals use when seeking health information. Searching for online health information has become a frequently preferred method of seeking health information due to the availability and scope of information, ease of searching and access, interaction, and privacy. In many countries over 70% of users use the internet for health knowledge.[5,6] In Turkey, however, according to the Turkish Statistical Institute's (TSI) 2021 data, the rate of searching for health-related information on the Internet was found to be 69.6%.[7] The growth in online the number of health information, telemedicine applications, mobile health services, applications, health information websites, or self-tracking systems has led to the proliferation of internet-based electronic health (e-health) services.

The increase in available health information on the internet and the widespread practice of online health information-seeking behavior do not necessarily imply that individuals are effectively benefiting from health information and services or that they are health-literate. The World Health Organization defines health literacy as "The cognitive and social skills which determine the motivation and ability of individuals to gain access to understand and use information in ways which promote and maintain good health".[8]

While easy and widespread access to health information can lead to increased knowledge and awareness of health-related matters in individuals, along with emotionally, physically, and behaviorally positive contributions, it can also increase anxiety. The term "cyberchondria" is used to describe this condition. Cyberchondria has been defined by Starcevic and Berle as "increased health anxiety or distress associated with excessive or repeated online searches for health-related information.".[9] Research shows that cyberchondria is associated with increased anxiety, general mental health issues such as depressive disorders [10,11] and internet addiction, increased healthcare utilization, functional impairment and a decrease in perceived quality of life.[1,2]

Understanding how women utilize online health information resources, their e-health literacy levels, and their cyberchondria behavior, as well as determining the relationship of these with participation in cancer screenings, is important. This study aims to investigate whether the online health information-seeking behavior, e-health literacy levels, and cyberchondria severity levels of women between the ages of 30-65 are related to participation in cervical cancer screenings.

Materials and Methods

A quantitative correlational screening model was used in this research. The study was carried out using a structured questionnaire consisting of scales and various questions to collect quantitative data in a correlational screening model. The data for this study was collected through participant surveys to determine the relationship between participation in cervical cancer screenings and a few variables, and the study was conducted using a cross-sectional method. The study was approved by Ankara Yıldırım Beyazıt University, Health Sciences Ethics Committee with the date and approval number 13.04.2023-04. Written informed consent was obtained from the participants for the research.

Working group

Our research included women between the ages of 30-65 who applied to the Ankara Bilkent City Hospital's gynecology and obstetrics clinics. In April 2023, a total of 504 women who applied to the Ankara Bilkent City Hospital's Gynecology and Obstetrics clinics participated in the study and 134 women who did not meet the criteria were excluded from the study, resulting in 370 women being included in the study. Patients with language barriers that made scale administration impossible, patients with intellectual disabilities, and patients with cervical pathology who were called in for follow-up were not included in the study.

Data Collection

A survey consisting of 46 questions divided into four parts was given to the participants to complete as the data collection tool to measure all independent variables. The first section of the questionnaire includes 11 questions aimed at collecting demographic information, assessing access to online resources, internet usage frequency, participation in cervical cancer screenings, and determining factors that led to participation.

The second part of the questionnaire includes 13 questions adapted from the National Cancer Institute's Health Information National Trends Survey (HINTS) to assess online health information seeking and internet usage preferences.[13] The questionnaire includes questions measuring general behavioral patterns towards online resources, determining usage frequency, assessing trust in online resources, and understanding whether the information obtained online affects individuals' actual health behaviors. These questions aim to measure health information-seeking behavior or health preferences on social media.

The third and fourth parts of the questionnaire consist of standardized scales. The third part includes the "e-Health Literacy Scale (eHEALS)", developed by Norman and Skinner and adapted into Turkish by Gencer, which consists of 10 items to measure the participants' e-health literacy.[14] This scale aims to determine various sub-skills of e-health literacy, including traditional literacy, health literacy, information retrieval, scientific literacy, media literacy, and computer literacy. The scale consists of 2 items related to internet use and 8 items assessing internet attitudes. The scale items are rated on a 5-point Likert scale. Scores on the scale can range from a minimum of 8 points to a maximum of 40 points.

The fourth part of the questionnaire, the "Short Form Version of the Cyberchondria Severity Scale (CSS-12)" consists of 12 items, which is a short form of the 33-item "Cyberchondria Severity Scale" developed by McElroy and Shevlin and adapted into Turkish by Söyler et al. was used to measure cyberchondria levels. [15] The scale used is a multidimensional measurement tool with a 5-point Likert format and consists of four components (compulsion, excessiveness, distress, and reassurance seeking). Each item can receive a maximum of 5 points, with a total score ranging from a minimum of 12 points to a maximum of 60 points.

Data Analysis

SPSS 23.0 software was used for the statistical analysis of the data. Descriptive statistics include numbers and percentages for qualitative data and mean, standard deviation, and median (minimum; maximum) for quantitative data. The normal distribution suitability of the variables was examined both visually (using histograms and probability plots) and analytically (using Kolmogorov-Smirnov/Shapiro-Wilk tests). In comparing independent groups, categorical comparisons were made using Pearson's chi-squared test and Fisher's Exact Test. For comparisons involving measurement variables, the one-way ANOVA, the Welch ANOVA, and the Student t-test were used. In cases where significant differences were found between groups, pairs of

post-hoc comparisons were conducted using the Bonferroni test and the Tamhane T2 test. The Pearson correlation test was used for correlation analyses. The statistical significance level was accepted as p<0.05.

Results

A total of 370 women participated in the study, and 270 (72.97%) of the participants stated that they had undergone Pap Smear or HPV DNA testing at least once in their lifetime. The mean age of the participants was 43.18 ± 8.23, (30-65). The mean age of those who had undergone Pap Smear or HPV DNA testing at least once in their lifetime was statistically significantly higher than those who had not (40.61 ± 7.52; 44.0 ± 8.01, p=0.001). The distribution of the participants' sociodemographic characteristics and smear screening data is summarized in Table 1.

Table 1: The state of having a pap smear test based on descriptive characteristics of the participants

	Total (n=370) (%)	Status of Pap Smear Testing (n) (%)		
		No (n=100)	Yes (n=270)	*P**
Marital Status				
Divorced	72 (19.45)	23 (31.94)	49 (68.05)	0.290
Married	298 (80.54)	77(25.83)	221 (74.16)	
Education level				
Primary School	94 (25.40)	32 (34.04)	62 (65.95)	
High School	109 (29.45)	34 (31.19)	75 (68.80)	**0.029**
Undergraduate /graduate	167(45.13)	34 (20.35)	133 (79.64)	
Income Level				
0-10.000 TL	113 (30.54)	35 (30.97)	78 (69.02)	
10001-20.000 TL	126 (34.05)	20 (15.87)	106 (84.12)	**0.013**
>20.000 TL	52 (14.05)	16 (30.76)	36 (69.23)	
No answer	79 (21.35)			
Chronic Disease				
No	252 (68.10)	80 (31.74)	172 (68.25)	**0.003**
Yes	118 (31.89)	20 (16.94)	98 (83.05)	

(*Pearson chi-square test)

76.29% of the participants who had undergone Pap Smear or HPV DNA testing at least once in their lifetime, knew how often it should be done. While 61.35% of the participants mentioned their previous examinations as their source of information, 6.28% stated that they obtained information from the Internet and social media. The data is summarized in Table 2.

Table 2. Distribution of participants' characteristics of having a pap smear test

	n	(%)
Status of Pap Smear and/or HPV DNA Test (n=370)		
No	100	27.02
Yes	270	72.97
Knowledge frequency of Pap Smear Test (n=270)		
No	64	23.70
Yes	206	76.29
Sources of information (n=207)		
Family Doctor	45	21.73
Previous gynecological examination	127	61.35
Internet and Social Media	13	6.28
Others	22	10.62

There was no statistically significant relationship found between the participants' age and their use of the Internet when making decisions about health (43.52 ± 8.13; 42.81 ± 8.24; $p=0.460$). However, a statistically significant difference was observed between participants' education levels, frequency of internet usage, and their use of the internet when making decisions about health ($p<0.05$). The data is summarized in Table 3.

The participants had an average score of 26.21 ± 7.43; a mean of 27 (8; 40) on the e-Health Literacy Scale, while they obtained an average score of 29.81 ± 8.62; a mean of 30 (12; 56) on the Cyberchondria Severity Scale. A statistically significant difference was found between the participants' education level and the scores they obtained from the e-Health Literacy Scale ($p=0.001$). A statistically significant difference was found between the participants' income levels and the scores they obtained from the e-Health Literacy Scale ($p=0.001$). A statistically significant difference was found between the participants' marital status, frequency of internet usage, and the scores they obtained from the Cyberchondria Severity Scale ($p<0.05$). Correspondingly, those who were widowed or divorced had significantly higher scores on the Cyberchondria Severity Scale. The data is summarized in Table 4.

Table 3: The state of using the Internet when making health decisions based on descriptive characteristics of the participants

	Status of using the internet when making health decisions (n)(%)		
	No	**Yes**	***p**
Marital status			
Divorced / Widow (n=72)	22 (30.55)	50 (69.44)	0.085
Married (n=298)	124 (41.61)	174 (58.38)	
Education Level			
Primary School (n=94)	48 (51.06)	46 (48.93)	
High School (n=109)	42 (38.53)	67 (61.46)	**0.020**
Undergraduate /graduate (n=167)	56 (33.53)	111 (66.46)	
Income Level			
0-10.000 TL (n=113)	42 (37.16)	71 (62.83)	
10.001-20.000 TL (n=126)	43 (34.12)	83 (65.87)	0.717
>20.000 TL (n=52)	21 (40.38)	31 (59.61)	
Chronic Disease			
No (n=252)	98 (38.88)	154 (61.11)	
Yes (n=118)	48 (40.67)	70 (59.32)	0.743
Status of having Pap Smear			
No (n=100)	36 (36.00)	64 (64.00)	
Yes (n=270)	110 (40.74)	160 (59.26)	0.407
Knowledge Frequency of Pap Smear Test			
No (n= 64)	24 (37.50)	40 (62.50)	
Yes (n= 206)	86 (41.74)	120 (58,25)	0.546
Internet usage frequency			
<1 hour /day (n=57)	33 (57.89)	24 (42.10)	
1-2 hour/day (n=94)	40 (42.55)	54 (57.44)	
2-4 hour/day (n=105)	38 (36.19)	67 (63.80)	**0.006**
>4 hour/day (n=114)	35 (30.70)	79 (69.29)	

(*Pearson chi-square test) (In the Bonferroni corrected analyses conducted for education levels it was observed that there was a significant difference between the group of participants with primary school and undergraduate /graduate. The Bonferroni-corrected analysis for internet usage frequency revealed that the difference was observed between the group that used the internet less than 1 hour /day and more than 4 hours/ day).

Tablo 4: e-Health Literacy Scale Score and Cyberchondria Severity Scale Score based on descriptive characteristics of the participants

	e- Health Literacy Scale Score (Average score±SD)	*p	Cyberchondria Severity Scale Score (Average score±SD)	*p
Marital Status				
Divorced / Widow (n=72)	25.81 ± 8.12	0.594	31.74 ± 8.32	**0.046**
Married (n=298)	26.32 ± 7.35		29.46 ± 8.61	
Education Level				
Primary School (n=94)	23.14 ± 7.92		29.41 ± 9.96	
High School (n=109)	26.16 ± 7.05	**0.001 ᵃ**	28.65 ± 8.23	0.096 ᵃ
Undergraduate /graduate (n=167)	28.05 ± 6.92		30.95 ± 8.06	
Income Level				
0-10.000 TL (n=113)	24.24 ± 7.81		29.16 ± 8.74	
10.001-20.000 TL (n=126)	26.94 ± 6.75	**0.001 ᵃ**	30.82 ± 8.51	0.239 ᵃ
>20.000 TL (n=52)	29.00 ± 7.63		28.96 ± 8.82	
Chronic Disease				
No (n=252)	26.59 ± 7.35		30.26 ± 8.53	
Yes (n=118)	25.60 ± 7.71	0.256	29.15 ± 8.92	0.270
Status of having Pap Smear				
No (n=100)	26.04 ± 7.02	0.735	29.56 ± 8.27	0.630
Yes (n=270)	26.39 ± 7.63		30.05 ± 8.71	
Knowledge Frequency of Pap Smear Test				
No (n=64)	25.83 ± 7.41	0.555	30.25 ± 8.82	0.785
Yes (n=206)	26.43 ± 7.77		29.98 ± 8.84	
Internet usage frequency				
1 hour /day (n=57)	22.91 ± 7.94		24.47 ± 7.33	
1-2 hour/day (n=94)	25.65 ± 6.62		30.37 ± 8.38	**0.001 ʷ**
2-4 hour/day (n=105)	27.95 ± 6.06	**0.001 ʷ**	31.17 ± 8.52	
>4 hour/day (n=114)	26.81 ± 8.55		31.14 ± 8.63	

(*Student-T test, ᵃOne-way ANOVA test, ʷ Welch ANOVA test, SD: Standard Deviation) (According to the results of the Bonferroni corrected subgroup comparisons, it was observed that there was a significant difference between the group of participants with a primary school and both the group of high school graduates and undergraduate /graduate. According to the results of the Bonferroni corrected subgroup comparisons, the difference was observed only between the group with an income of 10,000 TL or less and the group with an income of 20,001 TL or more. According to the results of the Bonferroni corrected subgroup comparisons for the difference arising from the frequency of internet usage, it was observed that the group using the internet for less than 1 hour per day had significantly lower scores compared to all other groups)

Discussion

Our study was conducted to investigate the relationship between women's e-health literacy levels, cyberchondria severity levels, and their knowledge, attitudes, and behaviors regarding cervical cancer screening.

According to the results of our study, as the educational level of women increased, their knowledge about the Pap smear test and their participation rates in screenings increased. It was also observed that those with higher income levels and those with chronic illnesses had higher rates of undergoing the Pap smear test. In a study that measured knowledge about HPV vaccines and the relationship between HPV and cervical cancer, similar to our study, it was found that as the educational level increased, knowledge and awareness levels also increased. It was also found that an increase in income level had an impact on HPV vaccinations.[16]

Participants with higher levels of education spend more time searching for online health information, and it has been observed that the e-health literacy levels of these individuals are higher. In Turkey, considering that almost 99% of individuals with a university education level or higher use the internet while those with a middle school education or lower have an average internet usage rate of around 60%, this is an expected situation.[17] Previous research has shown that individuals with lower levels of education may have more difficulty understanding health and medical information on the internet compared to those with higher levels of education.[18]

In our study, the average total score obtained from the e-health literacy scale is 26.21 ± 7.43, indicating a moderate level. The average score of our study's e-health literacy scale is similar to the results of other studies conducted in Turkey. The participants' average total score obtained from the Cyberchondria scale (CSS-12) is 29.81 ± 8.62. The average score we obtained in our study was lower compared to the results of other studies.[19,20]

In our study, unmarried women were found to spend more time searching for health information on the internet and have a higher level of cyberchondria severity. No significant difference was observed between e-health literacy and marital status. Similar to Zhang et al. study with cancer patients, no relationship was observed between e-health literacy and marital status.[21] Some studies have found a higher frequency of online health information-seeking behavior and cyberchondria severity in individuals who are married or in a stable relationship.[19,22] In a study conducted on diabetes patients, similar to our research, it was observed that unmarried individuals had a higher frequency of searching for health information on the Internet.[23] Additionally, there are studies indicating that in Turkey, unmarried individuals aged 18 and above have a higher level of cyberchondria severity compared to those who are married.[19,20] The increased amount of time

spent searching for health information on the internet and the significant relationship between internet usage frequency and cyberchondria severity in unmarried individuals may lead to these results.

In our study, it was found that women with a high income had higher e-health literacy scores and there was no relationship between cyberchondria levels and online health information-seeking behavior. Other studies in this regard have shown that individuals with a higher socioeconomic status tend to engage in online health information-seeking behavior more frequently.[6,18,23] The differences in the findings of our study may be attributed to the fact that in other studies, socioeconomic status encompasses a combination of various variables such as income, employment status, language proficiency, occupation, and education levels.

In our study, women with chronic illnesses did not show significant differences in their online health information-seeking behavior and e-health literacy scores. However, they exhibited higher levels of knowledge and positive attitudes towards smear screenings. There are studies in the literature that suggest individuals with chronic illnesses, who frequently access healthcare services, may have less need for online health information-seeking behavior.[5,24] Although there was no significant difference between the health literacy scale scores of our study population, regular health visits and controls positively affect attitudes towards cervical cancer screening in the patient population with chronic diseases.

In our study, we observed that online health information-seeking behavior did not lead to differences in knowledge, attitudes, and behaviors related to cervical cancer screening. These results may be related to the quality of information obtained on the internet and the level of trust in the information source. Similarly, in another study, there was no relationship found between online health information-seeking behavior and HPV awareness, HPV vaccination, and cervical cancer.[16] Moreover, in another research examining the relationship between social media usage and knowledge, awareness, and behaviors related to cervical cancer, it was observed that social media slightly increased awareness of cervical cancer and HPV but did not lead to changes in preventative behaviors. [25] It is known that information available on the internet, which is not prepared by expert teams, not proven for accuracy, not subjected to medical examination, and presented by non-professionals reduces the quality of health information that is obtained from the internet and hinders trust in the information source.

In a study investigating the relationship between e-health literacy and colorectal cancer screening participation, it was shown that low e-health literacy is associated with weaker cancer prevention knowledge and behaviors.[26] In another study, low e-health literacy was found to be associated with less attention to health and poor health outcomes [27]. In our study, no relationship was found between internet health information-seeking behavior and the time spent on it with participation in screenings. There are studies in the literature, consistent with our findings, that did not find a significant relationship between e-health literacy and previous

cancer screening experiences and receiving the HPV vaccination.[13,28] This result may be related to the fact that e-health literacy is not the sole factor affecting individuals' motivation for cancer prevention or that the acquired knowledge may not effectively motivate behavior. Individuals' knowledge and attitudes about cancer and cancer screenings, as well as various factors such as demographic factors and a family history of cancer, influence the decision to undergo cancer screening. [29,30] The results of our research have shown that despite high rates of online health information-seeking behavior, one of the most important factors influencing individuals' health decisions is doctor recommendation. The fact that our study was conducted on patients attending the gynecology outpatient clinic of a tertiary hospital may also explain the high participation rates in cervical cancer screening, regardless of e-health literacy levels.

Our study has some limitations. One of them is the small sample size, which restricts the generalizability of the results. Another limitation is that despite investigating how and how often individuals access general health-related information online, there is limited information about what specific information individuals search for on the internet, which has been criticized by some researchers. However, since participants cannot provide a clear answer about how much information they specifically look for on the internet for any particular health topic (in our study, cervical cancer and screenings), and because the OHISB questions are related to general health information-seeking, this limitation remains.

Conclusion

According to the results of our study, it can be said that the time spent on the internet and health information-seeking behavior did not translate into a positive attitude towards cervical cancer. It is still evident that the most influential factor in transforming health information into attitudes remains to be healthcare providers, especially doctors. Therefore, being informed by the family physician has an important role in ensuring patient participation in cancer screening programs. Considering the widespread use of the internet and the amount of time women spend online, it has become imperative to improve the quality and usability of the health information available on the internet to enhance its positive contributions to health**.**

Ethical Considerations: The study was approved by Ankara Yıldırım Beyazıt University, Health Sciences Ethics Committee with the date and approval number 13.04.2023-04.

Conflict of Interest: The authors declare no conflict of interest.

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