

The Relationship Between E-Health Literacy Level and Healthcare Demand Postponement Behavior

E-Sağlık Okuryazarlık Düzeyi ile Sağlık Hizmeti Talebi Erteleme Davranışı Arasındaki İlişki

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ABSTRACT

Objective: The study aims to determine the relationship between e-health literacy levels and the behavior of delaying healthcare demand. The association of this impact dimension has also been examined in terms of demographic variables.

Materials and Methods: This descriptive cross-sectional study used a survey method with 684 participants. Data collection involved a personal information form, e-health literacy, and a health service postponement behavior questionnaire.

Results: According to the research findings, no significant difference was found between hospital admission and e-health literacy ($p=0.491$). However, a significant difference was observed between hospital admission and health service postponement behavior ($p<0.000$). The importance of the internet in health decisions varied between e-health literacy and postponement behavior ($p=0.000$; $p=0.018$). Access to online health resources showed significant differences for both health literacy and postponement behavior ($p=0.000$; $p=0.000$). A positive correlation was found between e-health literacy and health service postponement. Additionally, e-health literacy significantly impacted traditional search behavior ($R^2=0.024$; $p<0.000$).

Conclusions: The research findings suggest that higher levels of e-health literacy correlate with a tendency to postpone healthcare services. Given the importance of early diagnosis and treatment, behaviors that delay healthcare should be mitigated.

Keywords: E-health literacy, health procrastination behavior, health services

ÖZ

Amaç: Bu araştırmanın amacı, e-sağlık okuryazarlık düzeyi ile sağlık hizmeti talebi erteleme davranışı arasındaki ilişkinin belirlenmesidir. Bu etki boyutunun demografik değişkenler açısından da ilişkisine bakılmıştır.

Materyal ve Metot: Tanımlayıcı ve kesitsel olan bu araştırma anket yöntemi ile 684 kişiye yapılmıştır. Veri toplama kişisel bilgi formu, e-sağlık okuryazarlık ve sağlık hizmeti talebi erteleme davranışı anketi kullanılmıştır.

Bulgular: Araştırma sonuçlarına göre, hastane başvurusu ve e-sağlık okuryazarlığı arasında anlamlı bir fark bulunmamıştır ($p=0,491$). Hastane başvurusu ile sağlık hizmeti erteleme davranışı arasında anlamlı bir fark gözlemlenmiştir ($p<0,000$). İnternetin sağlık kararlarında önemi, e-sağlık okuryazarlığı ile erteleme davranışı arasında anlamlı bir ilişki göstermiştir ($p=0,000$; $p=0,018$). Çevrimiçi sağlık kaynaklarına erişim, hem sağlık okuryazarlığı hem de erteleme davranışı için önemli ölçüde farklılık göstermiştir ($p=0,000$; $p=0,000$). E-sağlık okuryazarlığı ile sağlık hizmeti erteleme arasında pozitif bir korelasyon bulunmuştur. Geleneksel arama davranışı üzerinde e-sağlık okuryazarlığının önemli bir etkisi olduğu belirlenmiştir ($R^2=0,024$; $p<0,000$).

Sonuç: Araştırma bulguları, daha yüksek düzeyde e-sağlık okuryazarlığının, sağlık hizmetlerini erteleme eğiliminin artmasıyla ilişkili olduğunu göstermektedir. Erken teşhis ve tedavinin önemi göz önüne alındığında, sağlık hizmetinin gecikmesine neden olan davranışların azaltılması gerekmektedir.

Anahtar Kelimeler: E-sağlık okuryazarlığı, sağlık erteleme davranışı, sağlık hizmetleri

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INTRODUCTION

In daily life, many individuals can procrastinate and exhibit procrastination behavior.¹⁻³ Procrastination is defined as delaying a decision, taking responsibility, completing a task, or postponing it to a later time.⁴ Procrastination behavior in the field of health works differently than other procrastination behaviors. Due to the fact that health cannot be postponed, postponement can only be done with different substitution issues. When the literature is examined, it is seen that procrastination behavior in terms of health is grouped under three headings: Seeking personal/individual solutions, avoidance and failure to take action. This situation also includes the sub-dimensions of healthcare postponement behavior.⁵

In other words, if an individual is ill or faces a health-threatening situation, they should immediately benefit from healthcare services.⁶ There are some factors hindering individuals' demand for healthcare services. These can be listed as physical-environmental barriers, financial-structural barriers, communication problems with healthcare professionals, cultural competence, healthcare materials and technology, and health literacy.⁷

Health literacy is the ability to obtain and use health information to make appropriate health decisions and maintain health.⁸ The utilization of e-health applications has increased in recent years; however, some evidence suggests that it may increase health literacy in patients. Nonetheless, individuals with limited digital or e-health literacy may not fully benefit from these advantages. To mitigate this limited literacy level, a telehealth or e-health task force comprised of trained healthcare personnel is proposed.⁹

The World Health Organization defines "health literacy" as the cognitive and social skills required to acquire, understand, and use health-related information to improve and maintain health. Inadequate health literacy leads to insufficient health information, inability to take preventive measures, inadequate access to healthcare, and inadequate use of healthcare services.¹⁰ Put another way, e-health literacy is defined as the ability to search, find, understand, and evaluate health information from electronic sources and use the acquired information to solve a health problem.¹¹

This research aims to explore the relationship between individuals' e-health literacy levels and their tendency to postpone healthcare demands.

MATERIALS AND METHODS

Ethical Considerations: This study was conducted following the principles of the Code of Ethics of the World Medical Association Declaration of Helsinki in 2013.¹² Ethics committee approval was received

from Tokat Gaziosmanpaşa University Social and Humanities Research Ethics Committee (Date: 31.10.2023; decision No: 2023/17-8), and consent from the participants who agreed to participate in the study was obtained before they filled out the forms.

Research Design: E-health literacy has generally been studied regarding social media usage, the COVID-19 pandemic, individuals with chronic diseases, various demographic variables, mobile health applications, cyberchondria, children's health, e-Pulse (e-Nabız) system, breastfeeding mothers, students, technological readiness, and pregnant women. On the other hand, healthcare demand postponement behavior is a relatively new concept in the literature. It has been mainly studied in the context of academic procrastination, more nursing students, and work procrastination. This study aims to investigate individuals' e-health literacy levels and their behavioral tendencies to delay seeking healthcare despite their desire to receive it. In doing so, the behavioral dimension and its sub-dimensions were examined based on their significance levels and integrated within the conceptual framework.

Study Design and Participants: The research was conducted on adults residing in Türkiye, which has an adult population of approximately 62 million, in 2022, as reported by the Turkish Statistical Institute.¹³ Before starting the research, it was aimed to reach a minimum of 600 individuals. During the research process, the convenient sampling method¹⁴ was utilized, and 676 adult individuals were included in the research sample. According to the acceptable minimum sample sizes table created by Gürbüz and Şahin¹⁵ for different populations, it was deemed sufficient to reach a minimum of 384 individuals with a 95% confidence interval to represent populations of 250,000 and above. Additionally, when considering a 99% confidence interval with a 5% margin of error, it has been demonstrated that for populations of 1,000,000 and above, 665 individuals are sufficient to represent the population. In this context, it is believed that the inclusion of 684 individuals in the sample represents the population within the scope of the research. According to the findings of the research, 396 females and 280 males participated in the study. Regarding the age groups, there were 365 participants in the age range of 18-35, 273 participants in the age range of 36-54, and 38 participants in the age range of 55-74.

Data Collection Tools: The administered survey consists of three sections. In the first section, participants were initially asked about their gender, age, average annual visits to a healthcare institution due to health issues, and their daily internet use duration. Following that, the "e-health Literacy" scale developed by Coşkun and Bebiş¹⁶ was administered. It

consisted of 2 items related to internet use and 8 items measuring internet attitudes. Participants were asked to respond to the 2 items related to internet use on a scale of "a) Not at all useful, b) Not useful, c) Undecided, d) Useful, e) Very useful," while the other 8 items measuring internet attitudes required responses on a scale of "1-Strongly disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly agree." The internal consistency reliability coefficient (Cronbach's alpha) for this scale was calculated as 0.87 in the relevant study. Finally, the "Healthcare Demand Procrastination Scale" developed by Söyler et al.⁵ was administered. The scale involved 11 items. The scale had three sub-dimensions. Participants were asked to respond to these statements on a scale of "1-Strongly disagree, 2-Disagree, 3-Undecided, 4-Agree, 5-Strongly agree." The internal consistency reliability coefficient (Cronbach's alpha) was observed to be 0.85 in the relevant study.

Statistical Analysis: The data obtained were analyzed via the SPSS 25 software package. The data were only evaluated for individuals who received health services and ensured they had completed all the items. Descriptive statistics were presented, including frequency distribution for demographic characteristics of individuals receiving health services, mean and standard deviation values, and Cronbach's Alpha coefficient for reliability level determination. Skewness and Kurtosis analyses were conducted to assess the normal distribution of the data. Independent Samples t-test was employed to compare binary variable groups to test the research hypotheses. Finally, One-Way Analysis of Variance (ANOVA) was used to compare more than two vari-

able groups. In the correlation analysis, $p < 0.01$ was accepted as the significance level. The significance value was accepted as $p < 0.05$. An outlier analysis was conducted on the survey data obtained from the 684 participants. The analysis found that 8 data points were outliers and these data were removed from the analysis. The Cronbach's alpha value for the e-health literacy scale was 0.84, and for the Healthcare Demand Procrastination scale, it was found to be 0.80.

RESULTS

The following conclusions have been drawn from the study regarding the impact of individuals' e-health literacy levels on health procrastination behavior:

According to Table 1, there was no significant difference between the average number of visits to healthcare facilities due to any health problem and e-health literacy ($p = 0.491$). However, there was a significant difference between the average number of visits to healthcare facilities due to any health problem and health service postponement behavior ($p < 0.000$). Post-hoc Tukey test, according to in group comparisons, individuals who visited healthcare institutions less than twice a year exhibited higher healthcare postponement behavior than other groups. Those who visited the hospital less than twice had higher scores in traditional health information-seeking behavior than those who visited 4-5 times and more than 5 times. Individuals who visited healthcare institutions less than twice daily showed higher avoidance behavior than other groups (Table 1).

Table 1. Annual results of those admitted to the hospital due to any health problem.

	Average Annual Admissions to Healthcare Facilities	n (%)	Health Problem Score Mean±SD	Test
Average E-health Literacy Level	Less Than 2	196 (28.9)	3.57±0.59	F=0.80 p=0.491
	2-3 Times	192 (28.4)	3.58±0.53	
	4-5 Times	148 (21.9)	3.49±0.54	
	More Than 5	140 (20.8)	3.52±0.76	
Average Health Postponement Behavior	Less Than 2	196 (28.9)	2.84±0.62	F=13.65 *p=0.000
	2-3 Times	192 (28.4)	2.63±0.58	
	4-5 Times	148 (21.9)	2.57±0.56	
	More Than 5	140 (20.8)	2.46±0.40	
Traditional Search	Less Than 2	196 (28.9)	2.94±0.72	F=6.32 *p=0.000
	2-3 Times	192 (28.4)	2.81±0.89	
	4-5 Times	148 (21.9)	2.69±0.89	
	More Than 5	140 (20.8)	2.58±0.66	
Avoidance	Less Than 2	196 (28.9)	2.78±0.90	F=22.16 *p=0.000
	2-3 Times	192 (28.4)	2.38±0.75	
	4-5 Times	148 (21.9)	2.40±0.72	
	More Than 5	140 (20.8)	2.10±0.66	
Procrastination of Action	Less Than 2	196 (28.9)	2.81±0.58	F=2.263 p=0.080
	2-3 Times	192 (28.4)	2.76±0.50	
	4-5 Times	148 (21.9)	2.66±0.56	
	More Than 5	140 (20.8)	2.73±0.41	

n: number; X: mean; SD: standard deviation; *: $p < 0.05$.

As illustrated in Table 2, the significance of the internet in assisting you in making decisions about your health was found to be different for both e-health literacy and health postponement behavior ($p=0.000$; $p=0.018$). Post-hoc Tukey test revealed that individuals who found the internet very useful for making health decisions (4.02 ± 0.693) had higher e-health literacy scores compared to those who did not find it useful (3.09 ± 0.796). In another comparison, it was observed that for the sub-dimension of

health postponement behavior, those who believed the internet to be very useful (3.27 ± 0.769) had higher scores than those who believed it to be not useful (1.77 ± 0.796) (Table 2).

According to Table 3, there was a significant difference between the importance of accessing health resources on the Internet and health literacy, as well as health postponement behaviour ($p=0.000$; $p=0.000$). The significant differences observed in all sub-dimensions of health postponement behavior

Table 2. Results on the beneficial aspects of the Internet in assisting decision-making about your health.

	The Internet's Utility in Assisting Decision-Making Regarding Your Health	n (%)	Beneficial Score Mean±SD	Test
Average E-health Literacy Level.	Not Helpful at All	36 (5.4)	3.09±0.796	F=34.99 *p=0.000
	Not Helpful	92 (13.6)	3.20±0.721	
	Undecided	172 (25.5)	3.40±0.516	
	Helpful	304 (44.9)	3.67±0.435	
	Very Helpful	72 (10.6)	4.02±0.693	
Average Health Postponement Behavior	Not Helpful at All	36 (5.4)	2.33±0.542	F=6.56 *p=0.000
	Not Helpful	92 (13.6)	2.63±0.545	
	Undecided	172 (25.5)	2.63±0.632	
	Helpful	304 (44.9)	2.63±0.486	
	Very Helpful	72 (10.6)	2.90±0.717	
Traditional Search	Not Helpful at All	36 (5.4)	1.77±0.796	F=24.19 *p=0.000
	Not Helpful	92 (13.6)	2.71±0.816	
	Undecided	172 (25.5)	2.70±0.822	
	Helpful	304 (44.9)	2.84±0.707	
	Very Helpful	72 (10.6)	3.27±0.769	
Avoidance	Not Helpful at All	36 (5.4)	2.19±0.772	F=2.270 p=0.060
	Not Helpful	92 (13.6)	2.53±0.792	
	Undecided	172 (25.5)	2.47±0.910	
	Helpful	304 (44.9)	2.39±0.730	
	Very Helpful	72 (10.6)	2.61±0.931	
Procrastination of Action	Not Helpful at All	36 (5.4)	2.88±0.811	F=2.989 *p=0.018
	Not Helpful	92 (13.6)	2.68±0.446	
	Undecided	172 (25.5)	2.72±0.534	
	Helpful	304 (44.9)	2.73±0.413	
	Very Helpful	72 (10.6)	2.91±0.778	

n: number; X: mean; SD: standard deviation; *: $p < 0.05$.

Table 3. Results on the importance of accessing health resources on the Internet.

	The Importance of Accessing Health Resources on the Internet	n (%)	Health Resources Score Mean±SD	Test
Average E-health Literacy Level.	Not Important at All	28 (4.1)	2.67±0.57	F=37.53 *p=0.000
	Not Important	116 (17.1)	3.37±0.70	
	Undecided	88 (13.1)	3.38±0.39	
	Important	352 (52.1)	3.60±0.51	
	Very Important	92 (13.6)	3.98±0.58	
Average Health Postponement Behavior	Not Important at All	28 (4.1)	2.18±0.40	F=13.43 *p=0.000
	Not Important	116 (17.1)	2.41±0.44	
	Undecided	88 (13.1)	2.64±0.62	
	Important	352 (52.1)	2.75±0.52	
	Very Important	92 (13.6)	2.67±0.73	
Traditional Search	Not Important at All	28 (4.1)	1.76±1.06	F=20.93 *p=0.000
	Not Important	116 (17.1)	2.52±0.62	
	Undecided	88 (13.1)	2.63±0.91	
	Important	352 (52.1)	2.91±0.68	
	Very Important	92 (13.6)	3.01±0.98	

n: number; X: mean; SD: standard deviation; *: $p < 0.05$.

Table 3. Continue.

Avoidance	Not Important at All	28 (4.1)	2.07±0.72	F=7.26 *p=0.000
	Not Important	116 (17.1)	2.18±0.63	
	Undecided	88 (13,1)	2.53±0.92	
	Important	352 (52.1)	2.56±0.78	
	Very Important	92 (13.6)	2.34±0.91	
Procrastination of Action	Not Important at All	28 (4.1)	2.60±0.50	F=6.03 *p=0.000
	Not Important	116 (17.1)	2.56±0.44	
	Undecided	88 (13,1)	2.76±0.43	
	Important	352 (52.1)	2.82±0.50	
	Very Important	92 (13.6)	2.76±0.70	

n: number; X: mean; SD: standard deviation; *: p < 0.05.

indicate the importance of accessing health resources online. Post-hoc Tukey test when comparing groups, it was found that the e-health literacy scores of those who considered accessing health resources on the internet to be very useful (3.98±0.58) were higher than those who considered it not useful (2.67±0.57). In another comparison, for the sub-dimension of health postponement behavior, it was observed that those who believed accessing health resources on the internet to be very useful (3.01±0.98) had higher scores than those who believed it to be not useful (1.76±1.06) (Table 3). As shown in Table 4, according to the results of the correlation analysis, a positive relationship was

found between e-health literacy and healthcare postponement behavior. In other words, as the level of e-health literacy increases, the behavior of postponing health services increases (Table 4).

According to Table 5, a significant difference was found in the impact of e-health literacy level on traditional search behavior according to the results of the regression analysis (R²=0.024; p<0.000). As the e-health literacy level increases, a noticeable change occurs in people's traditional search behavior. In other words, individuals more knowledgeable about e-health tend to prefer traditional methods more when searching for health-related information.

Table 4. Correlation analysis between e-health literacy and health procrastination behavior.

	Average health Literacy Level.	Average Health Postponement Behavior.	Traditional Search	Avoidance	Procrastination of Action
Average E-health Literacy Level.	1				
Average Health Postponement Behavior	0.154**	1			
Traditional Search	0.238**	0.724**	1		
Avoidance	0.040	0.885**	0.425**	1	
Procrastination of Action	0.122**	0.785**	0.352**	0.040	1

** : p<0.01.

Table 5. The impact of e-health literacy level on health service procrastination behavior.

B	Std Error	R	T	F	R ²	p
0.145	0.124	0.154	4.038	16.309	**0.024	*0.000

Dependent Variable: Average health procrastination behavior; Independent variable: average e-health literacy level; B: unstandardised coefficients; ; Std Error: standard error; R: Correlation coefficient; T: difference between means; F: distribution; **R²: determination coefficient; *p: meaningfulness.

DISCUSSION AND CONCLUSION

When reviewing other academic studies related to this research, no prior research has been identified that specifically explores the intersection of e-health literacy and the behavior of delaying requests for health services.

In the study, no significant difference was found between health literacy levels and age, gender, average annual visits to healthcare facilities, and daily internet usage. However, Norgaard et al.,¹⁷ Deniz,¹⁸ Uslu and Şeremet,¹⁹ Aktürk,²⁰ Orhan et al.,²² and Hoşgör and Tosun,²³ observed differences in their studies.

The study found no statistically significant difference between the mean number of healthcare facility visits related to any health issue and e-health literacy ($p=0.491$). However, a significant disparity was observed between the mean number of healthcare facility visits for any health concern and behavior associated with postponing health services ($p<0.000$). The significance of the internet in aiding individuals in making health-related decisions was found to vary between e-health literacy and health postponement behavior ($p=0.000$; $p=0.018$). A notable distinction was observed in the significance of accessing health resources on the Internet concerning both health literacy and health postponement behavior ($p=0.000$; $p=0.000$).

The correlation analysis revealed a positive association between e-health literacy and healthcare postponement behavior, indicating that as e-health literacy levels increase, there is a greater inclination to delay seeking healthcare services.

In contrast, the regression analysis demonstrated a significant effect of e-health literacy level on conventional search behavior ($R^2=0.024$; $p<0.000$), showing that as e-health literacy levels increase, individuals tend to favor traditional search methods for health-related information.

The importance of accessing health resources on the Internet was expressed by 352 participants (52%). Zhang et al.²⁴ found that cancer patients had a high level of e-health literacy, emphasizing that cancer patients increasingly sought health information from the Internet. Furthermore, individual needs affect e-health literacy. The literature underlines the significance of improving the e-health of patients with chronic diseases to enhance overall health and reduce the hospital burden.²⁵

The finding suggests a significant difference ($p=0.00$) between the perceived usefulness of the Internet in assisting individuals in making decisions about their health and the importance of accessing health resources online. Kurtuğlu, Yılmaz, and Taş²⁶ have demonstrated that e-health literacy increases with various factors. Tümer and Sümen²⁷, conducted research and found that individuals who understand

the importance of health and have easy access to the internet tend to have higher scores in digital health literacy. Further, there was a statistically significant difference between both e-health literacy and healthcare postponement behavior and the significance of accessing online health resources. Parallel to this research, Hasannejadasl et al.⁹ expressed in their study that the perceived level of e-health literacy was satisfactory and that the Internet was a strategic tool source of health information.

In conclusion, a positive relationship has been found between e-health literacy and healthcare postponement behavior. In other words, as e-health literacy increases, the behavior of postponing healthcare demands increases. These findings underscore the relationship between e-health literacy and healthcare postponement behavior, as well as its impact on conventional search behavior. As e-health literacy levels increase, individuals may be more inclined to postpone healthcare services while also showing a greater preference for traditional search methods. These results suggest that e-health literacy can influence health decision-making and alter information-seeking behaviors. Understanding the increasing significance of e-health literacy and the complexities and implications of digital transformation in accessing healthcare services is crucial.

Ethics Committee Approval: This study was conducted following the principles of the The Code of Ethics of the World Medical Association Declaration of Helsinki in 2013. Ethics committee approval was received from Tokat Gaziosmanpaşa University Social and Humanities Research Ethics Committee (Date: 31.10.2023; decision No: 2023/17-8), and consent from the participants who agreed to participate in the study was obtained before they filled out the forms.

Conflict of Interest: No conflict of interest was declared by the authors.

Author Contributions: Concept – AÇ; Supervision – AÇ; Materials – AÇ; Data Collection and/or Processing – AÇ; Analysis and/ or Interpretation – AÇ; Writing – AÇ.

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