



RESEARCH

Digital health literacy and perceptions of infectious diseases in primary care: potential implications for medical education

Birinci basamakta dijital sağlık okuryazarlığı ve bulaşıcı hastalık algısı: tıp eğitimi için olası çıkarımlar

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Abstract

Purpose: This study aimed to examine the relationship between perceptions of infectious diseases and digital health literacy among adults attending a primary care setting and to explore the potential implications of these findings for patient education and medical education.

Materials and Methods: This cross-sectional descriptive study was conducted at an Educational Family Health Center affiliated with a university department of family medicine between May and August 2024. A total of 324 adults were included. Data were collected using a sociodemographic questionnaire, the Perceptions of Infectious Diseases Scale, and the Digital Health Literacy Scale.

Results: The mean age of the participants was 33.9 ± 11.3 years, and 59.3% were female. Healthcare professionals were reported as the primary source of health information by 66.4% of participants, whereas 94.4% stated that they had never searched for health-related information online. A weak positive correlation was identified between total scores on the Perceptions of Infectious Diseases Scale and the Digital Health Literacy Scale. Higher digital health literacy levels were associated with higher educational attainment and better self-rated health status. P

Conclusion: These findings highlight the potential importance of strengthening physicians' roles as digital health educators within medical education curricula to support patient education, reduce misinformation, and improve infectious disease prevention strategies.

Keywords: Digital health literacy, infectious disease perception, primary care, medical education

Öz

Amaç: Bu çalışmanın amacı, birinci basamak sağlık hizmetlerine başvuran erişkin bireylerde bulaşıcı hastalık algısı ile dijital sağlık okuryazarlığı arasındaki ilişkiyi incelemek ve bu bulguların tıp eğitimi ile hasta eğitimi stratejileri açısından olası önemini değerlendirmektir.

Gereç ve Yöntem: Bu kesitsel ve tanımlayıcı çalışma, bir üniversite aile hekimliği anabilim dalına bağlı bir Eğitim Aile Sağlığı Merkezi'nde yürütülmüştür. Mayıs–Ağustos 2024 tarihleri arasında 324 erişkin katılımcı çalışmaya dahil edilmiştir. Veriler; sosyodemografik veri formu, Bulaşıcı Hastalıklara Yönelik Algı Ölçeği ve Dijital Sağlık Okuryazarlığı Ölçeği kullanılarak toplanmıştır.

Bulgular: Katılımcıların yaş ortalaması $33,9 \pm 11,3$ yıl olup %59,3'ü kadındı. Sağlıkla ilgili bilgiye ulaşmada en sık tercih edilen kaynak sağlık personeli (%66,4) iken, katılımcıların %94,4'si sağlıkla ilgili dijital ortamda hiç araştırma yapmadığını bildirmiştir. Bulaşıcı Hastalıklara Yönelik Algı Ölçeği toplam puanı ile Dijital Sağlık Okuryazarlığı Ölçeği toplam puanı arasında zayıf ancak istatistiksel olarak anlamlı pozitif bir ilişki saptanmıştır. Dijital sağlık okuryazarlığı düzeyinin eğitim durumu arttıkça yükseldiği ve sağlık durumunu daha iyi olarak algılayan bireylerde daha yüksek olduğu görülmüştür.

Sonuç: Bu bulgular, hasta eğitimi, yanlış bilginin önlenmesi ve bulaşıcı hastalıklarla mücadelede tıp eğitimi müfredatının dijital sağlık yetkinliklerini kapsayacak şekilde geliştirilmesinin önemini vurgulamaktadır.

Anahtar kelimeler: Dijital sağlık okuryazarlığı, bulaşıcı hastalık algısı, birinci basamak sağlık hizmetleri, tıp eğitimi

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INTRODUCTION

Every research study begins with an observation. The present study originated from the clinical observation that adult patients attending an Educational Family Health Center (EFHC) demonstrated limited awareness and perceptions regarding infectious diseases. During efforts to improve patients' awareness of infectious diseases, it was also observed that although many individuals had access to digital technologies and health-related online platforms, some patients remained hesitant to discuss infectious disease-related concerns during face-to-face clinical encounters. These communication barriers raise important questions regarding how physicians' educational roles in undergraduate and postgraduate medical training can be effectively supported through digital health tools. Accordingly, this study aimed to investigate the relationship between adults' digital health literacy (DHL) and their perceptions of infectious diseases, as well as factors potentially associated with this relationship.

Contemporary medical education expects physicians not only to possess biomedical knowledge but also to develop leadership competencies that enable them to navigate rapidly evolving digital information environments¹. As access to health information has increasingly shifted to digital platforms, physicians' traditional role as the primary source of health information has evolved toward a guidance-oriented model in which physicians help patients interpret, evaluate, and contextualize online health information². This transformation has emphasized the importance of integrating structured digital health competencies into undergraduate medical curricula and residency training programs while also considering patients' digital health literacy levels during clinical encounters^{3,4}.

Infectious diseases are defined as conditions caused by microorganisms or their toxic products and transmitted from an infected person, animal, or environmental reservoir to a susceptible host either directly or indirectly⁵. Throughout history, infectious disease outbreaks have caused substantial morbidity and mortality, particularly before the development of effective preventive and therapeutic interventions. Although vaccines and antimicrobial therapies have significantly reduced transmission rates and mortality, technological advances in the modern era have highlighted digital health literacy as an

important complementary tool for infectious disease prevention⁶.

The World Health Organization defines digital health literacy as the ability to seek, find, understand, evaluate, and apply health information obtained from electronic sources to address health-related problems⁷. Adequate digital health literacy enables individuals to engage more actively in health management, use digital technologies during diagnostic and treatment processes, and improve access to healthcare services through digital platforms⁸. Although digital health literacy has been widely studied in the context of non-communicable diseases, its relevance to infectious disease prevention has become increasingly apparent, particularly during the COVID-19 pandemic⁹.

Within contemporary medical education frameworks, physicians' responsibilities as health advocates increasingly include guiding individuals in acquiring digital health competencies¹⁰. Physicians now function as "digital bridges," helping patients navigate misinformation and identify reliable health information sources in the context of widespread infodemics^{11,12}. Particularly in primary care settings, assessing patients' digital health literacy levels and directing them toward appropriate digital resources have become important components of patient-centered care¹³. Consequently, medical students and residents should be trained to implement communication- and education-based approaches that support patients' digital health skills during clinical encounters^{3,10,14}.

Family medicine serves as the first point of contact within the healthcare system and plays a central role in infectious disease prevention and patient education. In this context, the present study investigated the relationship between perceptions of infectious diseases and digital health literacy among adults attending an Educational Family Health Center. In addition, factors potentially associated with this relationship and the possible implications for patient education and medical education were explored.

We hypothesized that higher levels of digital health literacy would be associated with more positive perceptions of infectious diseases and preventive behaviors. Although several studies have examined digital health literacy in various healthcare contexts, research specifically investigating its association with perceptions of infectious diseases remains limited.

Therefore, this study aimed to address this gap in the literature within a primary care educational setting.

MATERIAL AND METHODS

Study design and sample

This cross-sectional descriptive study was conducted at an Educational Family Health Center (EFHC) affiliated with the Department of Family Medicine, Faculty of Medicine, Çukurova University. The EFHC functions as an active clinical learning environment integrated into undergraduate and postgraduate medical education programs.

A non-probability consecutive sampling method was used. All eligible adults presenting during the study period were invited to participate. Although no *a priori* sample size calculation was performed, post hoc sensitivity analysis demonstrated that the final sample size ($n = 324$) provided 80% statistical power at a two-sided alpha level of 0.05 to detect a correlation coefficient of approximately $r = 0.16$ or greater.

The study population consisted of adults registered to four family medicine units within the EFHC: unit 056 ($n = 2128$), unit 051 ($n = 2272$), unit 047 ($n = 2494$), and unit 062 ($n = 1627$). The study sample included adults who presented to the EFHC for any reason between May 1 and August 1, 2024.

To minimize potential confounding factors, the following exclusion criteria were applied: age younger than 18 years, inability to speak Turkish, illiteracy, visual impairment, diagnosis of dementia or psychotic disorders, and unwillingness to participate in the study.

Procedure

Approval for the study was obtained from the Academic Board of the Department of Family Medicine, Faculty of Medicine, Çukurova University, and from the Ethics Committee for Non-Interventional Clinical Research at Çukurova University (decision no. 145, dated April 5, 2024). All procedures involving human participants were conducted in accordance with the ethical standards of the institutional and national research committees and with the principles of the 1964 Declaration of Helsinki and its subsequent amendments.

Written informed consent was obtained from all participants before data collection. Permission to use

the study instruments was obtained from the researchers who conducted the Turkish adaptation studies of the scales.

Following ethical approval, data were collected between May 1 and August 1, 2024. Eligible participants were informed about the study during routine outpatient visits. After written informed consent was obtained, participants completed the questionnaires in a quiet outpatient interview area under researcher supervision. Completion of the study instruments required approximately 15–20 minutes. During the study period, 380 adults presenting to the EFHC were approached for participation. Of these, 24 declined participation, 15 did not complete the questionnaires, and 17 reported insufficient time to participate. Consequently, 324 participants were included in the final analysis, corresponding to an analyzable response rate of 85.3%. All questionnaires, including the sociodemographic data form and both scales, were administered face-to-face by trained family medicine residents and researchers working at the Educational Family Health Center.

Measures

Data were collected using three instruments: a sociodemographic data form, the Perceptions of Infectious Diseases Scale (PIDS), and the Digital Health Literacy Scale (DHLS).

Sociodemographic Data Form

The sociodemographic data form included questions regarding age, sex, marital status, chronic disease status, sources of health-related information, and internet use for health-related purposes.

Perceptions of Infectious Diseases Scale (PIDS)

The Perceptions of Infectious Diseases Scale was developed by Demir Gökmen et al. in 2022 and consists of 34 items grouped into two domains¹⁵. The first domain, “General Perception and Prevention Methods,” evaluates perceptions related to infectious diseases and preventive approaches, whereas the second domain, “Perception of Transmission,” assesses perceptions regarding transmission routes. Items are rated on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree,” resulting in total scores ranging from 34 to 170. Higher scores indicate more positive perceptions regarding infectious diseases, transmission routes, and

preventive measures. The originally reported Cronbach's alpha coefficient of the scale was 0.98.

Digital Health Literacy Scale (DHLS)

The Digital Health Literacy Scale was originally developed by van der Vaart and Drossaert, and its Turkish validity and reliability study was conducted by Gümüş and Çetin in 2023^{4,16}. The scale evaluates digital health literacy across six domains: information searching, evaluating reliability, determining relevance, adding content, navigation skills, and protecting privacy. It is considered a useful instrument for assessing digital health competencies relevant to patient education and clinical communication. A 4-point Likert scale is used for the domains of information searching, evaluating reliability, determining relevance, and adding content. Reverse-coded 4-point Likert items are used for the navigation skills and protecting privacy domains. The overall Cronbach's alpha coefficient reported for the Turkish version of the scale was 0.896.

Statistical analysis

Categorical variables were summarized as frequencies (n) and percentages (%), whereas continuous variables were expressed as mean $\pm$ standard deviation or median with interquartile range (Q1–Q3), as appropriate. The Kolmogorov–Smirnov test was used to assess the normality of continuous variables. Because several continuous variables did not meet normal distribution assumptions, non-parametric statistical methods were preferred. The Mann–Whitney U test was used for comparisons between two independent groups involving non-normally distributed continuous variables. Comparisons among more than two groups were performed using the Kruskal–Wallis test, followed by Dunn's post hoc test for pairwise comparisons when appropriate. Spearman's rank correlation analysis was used to evaluate associations between scale scores because of the ordinal structure of the scales and the non-normal distribution of the variables. Statistical analyses were performed using IBM SPSS Statistics version 20 (IBM Corp., Armonk, NY, USA). A two-sided p-value <0.05 was considered statistically significant.

RESULTS

A total of 324 participants were included in the study. The mean age was 33.9 ± 11.3 years, and 59.3% of the participants were female. The sociodemographic

characteristics of the study population are summarized in Table 1. Among the participants, 40.7% were male and 59.3% were female. Regarding occupational status, the most common groups were homemakers (23.1%), civil servants (19.4%), healthcare professionals (10.5%), students (10.2%), and workers (10.2%). More than half of the participants were married (58.6%).

In terms of educational attainment, undergraduate graduates constituted the largest group (41.0%), followed by high school graduates (21.6%) and individuals with associate degrees (13.0%). Monthly income levels varied considerably; 24.1% of participants reported a monthly income between 30,000 and 50,000 Turkish Lira, whereas 18.5% reported having no regular income. More than half of the participants (51.5%) reported living with their parents and/or siblings. Detailed sociodemographic data are presented in Table 1.

Regarding self-perceived health status, 50.3% of participants described their health as “good,” whereas 30.9% reported a “moderate” health status. Chronic disease was present in 26.9% of the study population. Analysis of health information sources, evaluated as a multiple-response variable, demonstrated that healthcare professionals were the most frequently reported source of health information (66.4%), followed by internet-based resources (59.9%). Printed media sources, including newspapers and magazines, were the least frequently reported information sources (5.9%).

Online health information-seeking behavior was evaluated separately from general health information sources. Overall, 94.4% of participants reported that they had never actively searched for health-related information online. In contrast, internet-based resources were commonly identified as general sources of health information. The items related to digital environments primarily reflected exposure to or access to health-related information and should not be interpreted as equivalent to intentional online health information-seeking behavior. Factors directing participants to health-related websites are presented in Table 2.

Internet search engines were identified as the most common factor directing individuals to health-related websites (70.7%), followed by social networks (35.8%) and visual or printed media (23.5%). Digital advertisements (6.5%) and recommendations from acquaintances (12.7%) were reported less frequently.

Table 1. Sociodemographic characteristics of the participants

Variable	Category	n	%
Sex	Male	132	40.7
	Female	192	59.3
Occupation	Housewife	75	23.1
	Worker	33	10.2
	Civil servant	63	19.4
	Healthcare professional	34	10.5
	Retired	22	6.8
	Student	33	10.2
	Private sector employee	18	5.6
	Other	46	14.2
Marital status	Married	190	58.6
	Single	134	41.4
Educational level	Literate only	2	0.6
	Primary school	22	6.8
	Secondary school	18	5.6
	High school	70	21.6
	Associate degree	42	13.0
	Bachelor's degree	133	41.0
	Master's degree	30	9.3
	Doctorate	7	2.2
Income status	Below minimum wage	36	11.1
	Minimum wage	53	16.4
	Minimum wage–30,000 TRY	49	15.1
	30,000–50,000 TRY	78	24.1
	Above 50,000 TRY	48	14.8
	No regular income	60	18.5
Living arrangement	Alone	44	13.6
	With friends	23	7.1
	With spouse and children only	39	12.0
	With parents/siblings only	167	51.5
	With spouse, children, and other relatives	43	13.3
	With parents/siblings and other relatives	6	1.9
	Other	2	0.6

Data are presented as frequency (n) and percentage (%). Abbreviations; TRY: Turkish Lira.

Table 2. Active online health information-seeking behavior and factors directing participants to health websites

Variable	Category	n	%
Have you ever searched for health-related information online?	No	306	94.4
	Yes	18	5.6
Factors directing individuals to health websites			
Visual and print media	No	248	76.5
	Yes	76	23.5
Social networks	No	208	64.2
	Yes	116	35.8
Internet search engines	No	95	29.3
	Yes	229	70.7
Digital advertisements	No	303	93.5
	Yes	21	6.5
Recommendations from acquaintances	No	283	87.3
	Yes	41	12.7

When reasons for preferring the internet for health-related information were examined, easy and rapid access to information was the most frequently reported reason (94.1%). Other reported reasons included obtaining information about health issues participants felt hesitant to discuss with healthcare professionals (27.2%), lack of confidence in independently managing health problems (11.4%), low cost (7.7%), and perceived inadequacy of local healthcare services (4.0%). The types of health-related information accessed through digital platforms were also evaluated. As shown in Table 3, the most frequently accessed topics were information

regarding medications and medication side effects (63.9%) and current health news related to participants' illnesses (57.4%). Information about healthcare professionals was accessed by 43.3% of participants, whereas 29.9% searched for information about hospitals. Lower proportions of participants reported accessing information related to herbal treatments (29.7%) and complementary or alternative therapies (18.8%).

Overall, 21.9% of participants reported applying health-related information obtained from the internet without verifying its accuracy.

Table 3. Types of health-related content accessed in digital environments

Type of information	Response	n	%
Current health news related to my illness	No	138	42.6
	Yes	186	57.4
Information about hospitals	No	227	70.1
	Yes	97	29.9
Descriptive and alternative treatments	No	263	81.2
	Yes	61	18.8
Information about healthcare professionals	No	183	56.7
	Yes	140	43.3
Natural herbal treatments	No	227	70.3
	Yes	96	29.7
Medications and medication side effects	No	117	36.1
	Yes	207	63.9

Table 4. Correlations between total and subscale scores of the Perceptions of Infectious Diseases Scale and the Digital Health Literacy Scale

Scale		1	2	3	4	5	6	7	8	DHLS Total
PIDS general	r	0.73	0.98	0.09	0.03	0.05	0.16	0.15	0.21	0.16
	p	<0.001	<0.001	0.092	0.638	0.343	0.004	0.008	<0.001	0.004
PIDS transmission (1)	r		0.85	0.09	0.09	0.09	0.10	0.07	0.18	0.14
	p		<0.001	0.090	0.106	0.123	0.083	0.231	0.001	0.010
PIDS total (2)	r			0.10	0.05	0.07	0.15	0.13	0.21	0.17
	p			0.074	0.407	0.239	0.006	0.017	<0.001	0.003
DHLS Information seeking (3)	r				0.54	0.53	0.31	0.38	0.27	0.74
	p				<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
DHLS Evaluating reliability (4)	r					0.62	0.36	0.35	0.19	0.76
	p					<0.001	<0.001	<0.001	<0.001	<0.001
DHLS Determining relevance (5)	r						0.22	0.33	0.20	0.72
	p						<0.001	<0.001	<0.001	<0.001
DHLS Navigation (6)	r							0.39	0.39	0.64
	p							<0.001	<0.001	<0.001
DHLS Adding content (7)	r								0.43	0.70
	p								<0.001	<0.001
DHLS Protecting privacy (8)	r									0.57
	p									<0.001

PIDS: Perceptions of Infectious Diseases Scale; DHLS: Digital Health Literacy Scale, r: correlation coefficient, p: significance. Correlations were calculated using Spearman's rank correlation coefficient.

Digital Health Literacy Scale (DHLS) scores differed significantly according to educational level ($p = 0.037$). Post hoc analyses demonstrated that participants with a high school education had significantly higher DHLS scores than those with primary school education ($p = 0.007$). Participants reporting “very poor” self-rated health demonstrated significantly lower DHLS scores than those reporting better health status ($p = 0.005$).

Perceptions of Infectious Diseases Scale (PIDS) scores also differed significantly according to perceived ease of access to online health information ($p = 0.023$). Similarly, significant differences in PIDS

scores were observed according to digital device use. Participants who reported mobile phone use had higher median PIDS scores [160 (148–167)] than non-users [123 (117–129)] ($p = 0.027$). Likewise, participants using laptop computers demonstrated higher median PIDS scores [161 (151–168)] than those not using laptops [157 (142–166)] ($p = 0.019$). Overall, positive correlations of varying strengths were identified between the total and subscale scores of the Perceptions of Infectious Diseases Scale and the Digital Health Literacy Scale (Table 4).

Figure 1 illustrates the positive correlation between total PIDS scores and overall DHLS scores.

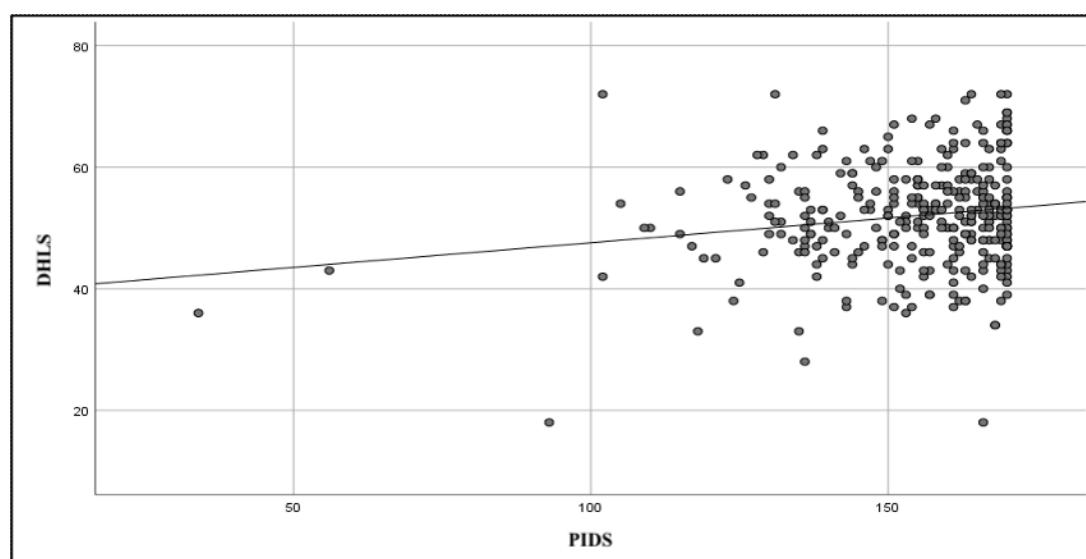


Figure 1. Relationship between total PIDS score and total DHLS score

DISCUSSION

This study explored patient-level associations between digital health literacy and perceptions of infectious diseases in a rapidly digitalizing primary care context, and considered the potential relevance of these findings for medical education^{10,17}. One of the most striking findings of this study was that 94.4% of participants reported never conducting online searches for health-related information, despite widespread access to digital devices. Furthermore, healthcare professionals were identified as the most frequently used source of health information (66.4%). These findings are

consistent with previous studies demonstrating that, even in the digital era, patients continue to regard physicians as their primary and most trusted source of health information¹⁸.

This persistent reliance on physicians underscores the evolving nature of patient education competencies in medical training. These findings may suggest that contemporary patient education could benefit from preparing physicians to guide patients in interpreting, evaluating, and contextualizing online health information³.

The management of “sensitive topics” within physician–patient communication represents a

critical component of communication skills curricula in medical education. In the present study, 27.2% of participants reported using the internet to seek information about health issues they felt reluctant to discuss with a healthcare professional, indicating the presence of communication barriers in traditional face-to-face encounters. This finding is particularly relevant for infectious diseases, where stigma remains a significant concern. Prior research highlights that empathetic communication and trust-based relationships between physicians and patients play a crucial role in protecting individuals from unregulated and potentially harmful digital information, especially during infectious disease outbreaks¹⁹. Accordingly, these findings may indicate a potential area for curricular attention in medical education, particularly in training physicians to recognize areas of patient hesitation and to guide patients toward reliable digital resources²⁰.

The finding that 21.9% of participants reported applying health information obtained online without questioning its accuracy highlights the clinical consequences of the “infodemic.” Although previous studies have shown that higher educational attainment is associated with increased digital health literacy, general education alone is insufficient to mitigate misinformation risks^{21,22}. Integrating structured “Digital Health Guidance” into medical education may be considered as a potential curricular response to this growing public health challenge, and future educational studies are needed to examine its impact.

Another noteworthy finding was the absence of preventive intent—specifically disease prevention—among the types of health information accessed on digital platforms. Given that healthcare professionals remain the most trusted information source, this finding underscores the pivotal role of healthcare providers in designing and delivering digital health literacy interventions. Beyond improving patients’ digital health literacy levels, directing individuals toward credible and evidence-based digital platforms is equally important. As the first point of contact within the healthcare system, family physicians may be well positioned to support patients’ digital health literacy through patient education; however, the educational implications of this observation remain to be tested in future studies.

In evaluating sociodemographic factors, educational level emerged as the only variable significantly associated with digital health literacy, with higher

education corresponding to higher literacy levels. This finding aligns with existing literature and reinforces the importance of educational attainment in digital health engagement^{21,22}. Conversely, participants who rated their health status as “very poor” demonstrated lower digital health literacy scores, indicating that individuals with the greatest healthcare needs may benefit the least from digital health resources. Similar findings have been reported in previous studies²³. This “digital divide” should be addressed within the framework of social responsibility and health equity in medical education. Moreover, the positive correlation observed between digital health literacy and perceptions of infectious diseases ($r = 0.17$; $p = 0.003$) suggests a limited association between digital health literacy and perceptions related to infectious diseases, rather than a strong or clinically robust relationship^{24,25}. Although statistically significant, the correlation between total PIDS and total DHLS scores was weak and should therefore be interpreted cautiously in terms of clinical or educational significance. Given the cross-sectional design, this finding indicates an association rather than a causal relationship.

The significant association between ease of access to health information and perceptions of infectious diseases suggests that improved access to accurate information may foster greater awareness and safer perceptions regarding infectious disease risks. This finding reinforces the critical role of digital health literacy in infectious disease prevention.

Previous studies have demonstrated associations between digital health literacy and preventive behaviors such as vaccination uptake and hand hygiene^{26,27}. In line with this literature, the present study found that participants using mobile phones and laptop computers had higher infectious disease perception scores. From a medical education perspective, these findings highlight the potential of digital devices as “mobile education tools” (mHealth). Particularly in academic primary care settings such as EFHCs, patients’ digital device usage may represent a potential opportunity for patient education; however, whether this should translate into specific curricular strategies requires further educational research.

Evidence from mHealth interventions further supports this approach. For example, Campbell et al. examined mHealth interventions among individuals living with or at risk for HIV in rural KwaZulu-Natal, South Africa, and reported higher smartphone

ownership among women, suggesting the feasibility and effectiveness of smartphone-based interventions for young women²⁸. Additionally, high rates of SMS use supported text-message-based interventions to promote condom use and reduce HIV transmission risk²⁸. Although no gender differences were observed in the present study, higher infectious disease perception scores among mobile phone and laptop users indicate that understanding patients' preferred digital access pathways may enhance the effectiveness of patient education in infectious disease prevention.

Finally, findings from a large-scale survey conducted by Aloglu et al. demonstrated that frequent exposure to pandemic-related news increased individuals' adherence to preventive behaviors, including mask use, hand hygiene, and avoidance of crowded environments²⁹. These findings suggest that digital platforms should not only be leveraged during pandemics, but also utilized continuously to disseminate evidence-based information on infectious diseases.

The present study has several strengths. Notably, it represents a pioneering investigation of the relationship between digital health literacy and perceptions of infectious diseases within a medical education-oriented primary care learning environment. Conducting the study in an Educational Family Health Center enhances the direct applicability of the findings to undergraduate and postgraduate medical curricula and primary care training strategies.

However, several limitations should be acknowledged. First, the cross-sectional design precludes causal inference. Second, as this was a single-center study conducted in an Educational Family Health Center, the findings may not be generalizable to other primary care settings or populations. Third, because the data were collected through face-to-face self-report, social desirability bias cannot be excluded, particularly for responses related to health information-seeking behaviors and digital health practices. Fourth, healthcare professionals constituted 10.5% of the sample, which may have influenced the overall levels of digital health literacy and perceptions of infectious diseases. Finally, although the study assessed the use of digital devices, it did not evaluate the frequency, intensity, or competence of actual use; therefore, device use should not be interpreted as equivalent to digital engagement or digital health literacy. Future multicenter studies with more heterogeneous

samples and more detailed measures of digital technology use would strengthen the evidence base. In addition, participants were recruited using a non-probability consecutive sampling approach from a single center during a fixed study period. Therefore, selection bias cannot be excluded, and the generalizability of the findings may be limited. In addition, the educational relevance of the findings should be interpreted cautiously, as the study was based on patient-level cross-sectional data and did not directly evaluate an educational intervention or curriculum outcome.

In conclusion, this study found a weak but statistically significant positive association between perceptions of infectious diseases and digital health literacy in primary care settings, while also showing that patients continue to regard physicians as the most trusted source of health information. The tendency of some patients to seek online information for sensitive topics and to apply such information without verifying its accuracy may be relevant to patient education and communication practices. These findings may have potential curricular implications for medical education, particularly with respect to preparing future physicians to recognize patients' digital health literacy needs and to guide them toward reliable digital resources. However, such implications should be interpreted cautiously, as they are hypothesis-generating and are derived from patient-level cross-sectional data rather than from an educational intervention.

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Ethical Approval: Ethical approval was obtained from the Research Ethics Committee of Çukurova University Faculty of Medicine (Decision No: 145, dated 5 April, 2024) Written informed consent was obtained from all participants prior to data collection.

Peer-review: Externally peer-reviewed.

Conflict of Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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