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A Study on the Necessity, Applicability, and Customer Profile of the E-pharmacy System

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ABSTRACT

The rise of information systems and Industry 4.0 is transforming supply chain business models across sectors. This study evaluates e-pharmacy patient profiles in Türkiye, assessing the feasibility and need for online medicine sales. Despite Türkiye's advancing e-government system enabling e-prescriptions, pharmacies remain barred from online sales due to regulatory restrictions. The research analyzes the necessity and suitability of e-pharmacies for patients, using survey data from 389 participants collected two years before COVID-19. Hypotheses were tested via T-test, Correlation, and Chi-square analyses. Findings indicate strong demand for e-pharmacies, with only 18% of respondents deeming the system inconvenient. Online purchases were more common for over-the-counter medicines, linked to internet and e-government usage, and illness frequency. Convenience was associated with education, age, and disability status, with disabled participants showing higher preference. The study highlights e-pharmacy's potential, serving as a foundation for future regulatory frameworks.

E-Eczane Sisteminin Gerekliliği, Uygulanabilirliği ve Müşteri Profili Üzerine Bir Çalışma

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ÖZ

Bilgi sistemlerinin ve Endüstri 4.0'ın yükselişi, tedarik zincirindeki iş modellerini sektörler genelinde dönüştürmektedir. Bu çalışma, Türkiye'deki e-eczane hasta profillerini değerlendirerek, ilaç satışlarının çevrimiçi olarak yapılmasının uygulanabilirliğini ve gerekliliğini incelemektedir. Türkiye gelişen e-devlet sistemi ve e-reçete uygulamasını hayata geçirmiş olsa da, eczacılar ve eczanelerle ilgili mevzuatta internet üzerinden ilaç alım-satımını yasaklayan düzenleme nedeniyle eczanelerin internet sitesi kurması ve çevrimiçi hizmet sunması engellenmektedir. Araştırma, COVID-19 pandemisinden iki yıl önce 389 katılımcıdan toplanan anket verilerini kullanarak e-eczanelerin hasta açısından gerekliliğini ve uygunluğunu analiz etmektedir. Hipotezler, T-testi, korelasyon ve ki-kare analizleri ile test edilmiştir. Bulgular, e-eczaneye yönelik güçlü bir talep olduğunu ve katılımcıların yalnızca %18'i bu sistemi hiç uygun bulmadığını göstermektedir. Çevrimiçi alışveriş, reçetesiz ilaçlarda daha yaygın olup, internet ve e-devlet kullanım sıklığı ile hastalanma sıklığıyla ilişkilidir. E-eczane kullanımının uygunluğu, eğitim düzeyi, yaş ve engellilik durumuyla bağlantılıdır; engelli katılımcılar arasında tercih daha yüksektir. Çalışma, e-eczanenin potansiyelini vurgulamakta ve gelecekte oluşturulacak düzenleyici çerçeveler için temel oluşturmaktadır.

1. INTRODUCTION

Global population growth and the concurrent decline in natural selection have led to the emergence of new diseases such as COVID-19 and increased existing diseases, prompting expansion in the pharmaceutical sector. The global pharmaceutical market reached $1.5 trillion in 2022, with Türkiye ranking 21st globally, achieving a volume of 109.8 billion Turkish Lira and 2.55 billion units [1].

E-commerce, supported by mobile applications, is widely used across various sectors, including pharmaceuticals [2]. The e-pharmacies sell prescription, nonprescription, and complementary medicines online [3]. These systems must comply with legal regulations. In the U.S., for example, laws limit online prescription purchases for first-time customers [4]. While online services can increase access, they can also increase costs, with online doctor visits averaging $70 and online pharmacy costs 15% higher than those of general practice visits [5].

Patients may prefer online consultations due to privacy concerns or discomfort with in-person interactions, and e-pharmacies facilitate this by allowing email inquiries and prescription management. However, there are concerns about privacy, information misuse, and the integrity of shipped medicines [6]. The user interfaces of e-pharmacies, guided by American Medical Association standards, must be designed to be patient friendly [7].

In Türkiye, e-pharmacies are prohibited under the Regulation on Pharmacists and Pharmacies [1], which bans the online sale of medicines and services via the internet. The Regulation on Pharmacists and Pharmacies issued by the Turkish Ministry of Health clearly prohibits the sale of prescription and non-prescription medications over the internet [8]. Additionally, the Turkish Medicines and Medical Devices Agency (TİTCK) does not license any platform for online pharmacy operations. These regulations aim to safeguard public health but simultaneously hinder digital transformation in pharmaceutical services. Unlike the Health Transformation Program's support for digital health tools like e-Nabız and e-reçete, pharmacy services remain traditionally structured. This study examines how e-pharmacy systems operate in other countries and assesses public opinion on potential regulatory changes in Türkiye. Despite progress in digital health through the implementation of systems such as e-Nabız (Personal Health Record System) and the mandatory e-prescription system since 2013, Türkiye's pharmacy regulations have not been updated accordingly. There remains a legal and administrative gap in integrating e-pharmacy into the broader e-health vision outlined in Türkiye's 11th Development Plan [9]. The e-pharmacy systems are influenced by government policies, competitor strategies, and insurance company policies, along with factors such as demand, law, supply, and stock. The internal environment includes system functioning, performance, workforce, and services. Figure 1 illustrates the environmental analysis of the e-pharmacy system.

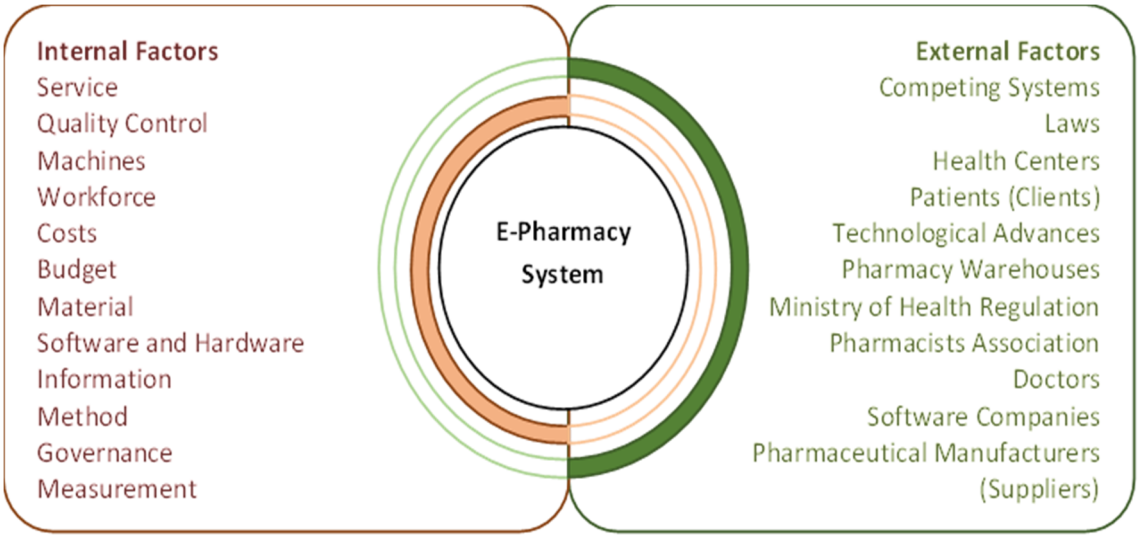

Figure 1. Environmental analysis of the e-pharmacy system

The steps for using e-pharmacy systems include website connection, account registration, personal information security, prescription fulfillment, and transaction completion [10]. Literature comparisons between traditional and e-pharmacies [4-6,11] revealed a SWOT analysis for Türkiye's e-pharmacy system, as shown in Figure 2. The SWOT analysis, while primarily developed through literature synthesis, is supported by several empirical findings of this study. For instance, the high percentage of participants favoring non-prescription product purchases online supports the 'Opportunity' element concerning increased consumer interest. Similarly, the legal prohibition of online pharmacies, emphasized by the vast majority of participants as a limitation, reflects the 'Threats' and 'Weaknesses' sections. The mismatch between user expectations and regulatory limitations directly supports the identified gaps in the SWOT framework.

Figure 2. SWOT analysis of the e-pharmacy system

The SWOT matrix presented here was constructed through a synthesis of literature review and thematically grouped survey insights. It reflects both theoretical assessments and empirical user trends observed in the study. In the study with using a questionnaire was used to evaluate the necessity of the e-pharmacy system, identifying suitable products and likely user profiles in Türkiye. The study aims to contribute to the development of Türkiye's e-pharmacy system and inspire further research in strategic areas. The literature shows that the development of e-pharmacy systems has been closely tied to country-specific regulatory frameworks and digital infrastructure. For instance, while India and the UAE have embraced remote pharmaceutical services due to population needs and system flexibility [17], Türkiye's strict regulatory limitations have hindered such digital transformation. Therefore, this study's regional findings serve as a preliminary insight into potential national-level reforms, aligning with global developments in pharmaceutical digitization.

The e-pharmacy, also known as internet pharmacy or online pharmacy, involves selling prescriptions, nonprescription, and complementary medicines online [3]. The first e-pharmacies, such as soma.com, drugstore.com, and PlanetRx.com, appeared in 1999 [10]. Understanding e-pharmacies requires examining traditional pharmacies. A survey in Spain highlighted that patients prioritize access to medication, health advice, and pharmacist consultations. Trust in pharmacists is crucial and is built through knowledge, attentiveness, accessibility, and private consultations [12]. A UK survey revealed that more than 60% of pharmacy visitors purchased prescription medicines [19]. Patient satisfaction in pharmacies requires a multidimensional approach [20]. In the UAE, a validated tool measures satisfaction on the basis of information, relationships, accessibility, and usability [21].

Effective e-pharmacies require well-designed websites. Bessell et al. [3] reported that 40% of 104 e-pharmacy websites had communication issues. The e-pharmacies must display authorized personnel, provide pharmacist advice, and show quality accreditation. Service quality can be evaluated in terms of cost, availability, customer service, and information systems [22]. Transitioning to e-pharmacies involves considering access, quality, costs, and regulations. In the U.S., e-pharmacies face various restrictions, emphasizing the need to use trusted websites [3]. The e-pharmacies are associated with better medication adherence and are valued for monitoring patients online, although pharmacists' high workloads can limit their use [23].

Misinformation about medicines is a concern in e-pharmacies, prompting efforts to use reliable applications. While useful, expert opinions are preferred [24]. The e-pharmacies address pharmacist shortages and offer privacy, lower prices, and home delivery, especially in India [17]. Patients view e-pharmacies positively for variety and affordability, despite concerns about information and product quality. Ensuring reliable e-pharmacy systems requires transparent e-health models that provide comprehensive information [25]. A conceptual model in Oman identified factors influencing online pharmacy use, such as perceived expectations and risks [26]. International standards and guidelines are needed for e-pharmacy systems [27].

In Russia, legalizing remote sales of nonprescription medicines increased demand by 803%, although regulation is needed to prevent counterfeit sales [16]. In India, perceived risk significantly affects online purchase intentions for e-pharmacies [28]. Despite this awareness, many prefer offline purchases because of quality concerns [29]. During the COVID-19 pandemic, e-pharmacies played a critical role in providing medications and protective equipment. The pandemic accelerated remote pharmacy services and online medicine purchases [30]. For example, a medication distribution platform in Jordan delivered thousands of prescriptions during lockdown [31]. In another example the using of computer software to identify potential drug interactions was widespread in community pharmacies (90.2%), in Switzerland [32]. China, internet hospitals reduce the time and costs for patients [14]. The pandemic has firmly integrated online pharmacies into healthcare systems [33]. In addition to the quantitative analyses, a strategic framework was developed through a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis to evaluate the readiness and applicability of e-pharmacy systems in Türkiye. The SWOT framework was informed by both the literature review and patterns observed in the survey responses, particularly regarding perceived barriers (e.g., legal limitations), user motivations (e.g., convenience), and concerns (e.g., information security). Although the

SWOT matrix itself is qualitative, it was guided by themes emergent from survey findings and stakeholder interpretations.

2. MATERIAL AND METHOD

In this study, the development of e-pharmacy from the first launch of e-pharmacy in 1999 to the present day is reviewed. A 5-point Likert scale questionnaire was prepared through Google Forms by considering studies on these issues and Türkiye's pharmacy system. The survey prepared questions are given in Annex 1. The target group of the study was the Turkish population, and the minimum sample size was determined to be 385 according to the formulation offered by Kılıç [34]. The formulation used for this calculation is given in Equation (1). where n is the sample size, N is the population size, p is the frequency of the situation under investigation, q is the probability of the situation not occurring, s is the margin of error acceptable by the researcher(s), and $(t_1 - a)$ is the accepted significance level, which is also the t statistic value corresponding to the type 1 error level.

$$n = \frac{N\ (t_1 - a)^2)(p * q)}{S^2(N-1) + S^2(p * q)} \tag{1}$$

In this study, the parameters required for the sample size N are 80,000,000, p and q, which are accepted equally, i.e., the 50% acceptable margin of error is 5%, and the Type 1 alpha error level is 5%. A total of 389 people participated in the survey, and the data obtained as a result were analyzed via the SPSS program. Within the scope of the analysis, the hypotheses of the study are presented in Annex 2.
The chi-square test was used to test these hypotheses. The chi-square test is used to test the relationship between two different variables [35]. H0 is assumed as "there is no relationship between categorical variables", and H1 is assumed as "there is a relationship between categorical variables". When the significance level (p value) of the test is less than 0.05, there is insufficient statistical evidence to accept hypothesis H0, so H0 is rejected [36]. Conversely, H0 is accepted, and it can be said that there is no statistical relationship between the relevant variables. In chi-square analysis, the chi-square value (χ^2) is calculated to determine the relationships between two variables, as shown in Equation 2 [37]. In Equation 2, G_{ij} represents the observed frequency, and T_{ij} represents the expected frequency.

$$\chi^2 = \sum_i \sum_j \frac{(G_{ij} - T_{ij})^2}{T_{ij}} \tag{2}$$

3. RESULTS AND DISCUSSION

Data on the demographic characteristics of the respondents are given in Table 1. The majority were aged 16-24 years, with 68% being women. Only 6% are married, and most hold undergraduate or graduate degrees. This sample predominantly includes young and female participants, specifically with 78% between ages 16–24 and 68% identifying as female. While this reflects the demographic profile of digitally engaged individuals in Türkiye, it also indicates a limitation in terms of the generalizability of the results to the broader population. The e-pharmacy systems concern all societal groups, including older adults and individuals with limited digital literacy, who are underrepresented in this sample. Most participants used the SSI for health insurance. Winter is the season in which respondents get sick most frequently, whereas summer is the least common season. Approximately 77% visit health centers at least once every six months. Common chronic conditions include eye, gastrointestinal, skin, and psychiatric diseases. Forty-two percent buy medicines from their regular pharmacy. Most respondents (88%) are satisfied with pharmacy working hours, valuing cleanliness, caring for staff, location, product variety, price, and busyness, in that order. They usually walk to pharmacies and rarely encounter transportation issues. In addition to medicines, cosmetics and women's products are commonly purchased. Medicine is typically obtained from the pharmacy rather than using leftover medicines or obtaining them from neighbors. Ninety-eight percent use the internet for at least two hours daily.

Table 1. Demographic characteristics of the participants

Age range	0-16	16-24	25-34	35-44	45-54	55-64
	1,03%	77,89%	19,02%	1,03%	0,51%	0,51%
Gender	Male			Female		
	32,13%			67,87%		
Marital status	Single			Married		
	94,60%			5,40%		
Number of children	None	One		Two	Three	Four+
	95,89%	2,57%		0,51%	0,77%	0,26%
Education level	Secondary school	High school		Undergraduate	Postgraduate	
	0,77%	8,48%		76,86%	13,88%	
Health insurance	Under eighteen age ins.	General SSI		Paid	Green card ins.	
	2,83%	82,78%		8,74%	5,66%	
Disability status	Disabled			Not disabled		
	1,29%			98,71%		

Table 2 summarizes the responses regarding the necessity and patient profiles for e-pharmacy. Sixty percent support e-pharmacies, whereas 18% are opposed. Forty percent are inclined to buy prescription medicines online, decreasing to 10% for nonprescription medicines. The survey results indicate that 40% of the respondents are sick every three months, 80% obtain medication with a prescription, 40% use the e-government system intensively, and only 15% are aware of e-pharmacies. Participants expect a maximum one-hour wait for all ordered products in an e-pharmacy system, preferring credit cards (52%) and payments on delivery (38%).

Table 2. Participants' responses related to e-pharmacy suitability according to demographic characteristics

		e-pharmacy order frequency (Prescription)				e-pharmacy order frequency (Non-prescription)				e-pharmacy eligibility					
		N	S	A	T	N	S	A	T	SD	D	NA-ND	A	SA	T
Age	14-16	1	1	2	4	4	0	0	4	1	1	0	1	1	4
		25%	25%	50%	100%	100%	0%	0%	100%	25%	25%	0%	25%	25%	100%
	16-24	61	116	126	303	117	160	26	303	54	73	80	64	32	303
		20%	38%	42%	100%	39%	53%	9%	100%	18%	24%	26%	21%	11%	100%
	25-34	18	32	24	74	27	37	10	74	14	16	13	16	15	74
		24%	43%	32%	100%	36%	50%	14%	100%	19%	22%	18%	22%	20%	100%
	35-44	0	1	3	4	2	2	0	4	0	1	0	2	1	4
		0%	25%	75%	100%	50%	50%	0%	100%	0%	25%	0%	50%	25%	100%
	45-54	0	1	1	2	0	1	1	2	0	0	1	0	1	2
		0%	50%	50%	100%	0%	50%	50%	100%	0%	0%	50%	0%	50%	100%
	55+	0	0	2	2	1	1	0	2	1	0	0	1	0	2
		0%	0%	100%	100%	50%	50%	0%	100%	50%	0%	0%	50%	0%	100%
Gender	Male	33	43	49	125	50	61	14	125	25	21	32	29	18	125
		26%	34%	39%	100%	40%	49%	11%	100%	20%	17%	26%	23%	14%	100%
	Female	47	108	109	264	101	138	25	264	45	70	62	55	32	264
		18%	41%	41%	100%	38%	52%	9%	100%	17%	27%	23%	21%	12%	100%
Marital status	Single	75	141	152	368	144	189	35	368	65	90	86	80	47	368
		20%	38%	41%	100%	51%	10%	39%	100%	18%	24%	23%	22%	13%	100%
	Married	5	10	6	21	7	10	4	21	5	1	8	4	3	21
		24%	48%	29%	100%	33%	48%	19%	100%	24%	5%	38%	19%	14%	100%
Education status	Undergraduate	56	109	134	299	112	160	27	299	60	64	80	65	30	299
		19%	36%	45%	100%	37%	54%	9%	100%	20%	21%	27%	22%	10%	100%
	Highschool	12	12	9	33	17	13	3	33	8	11	6	4	4	33
		36%	36%	27%	100%	52%	39%	9%	100%	24%	33%	18%	12%	12%	100%
	Primary school	1	2	0	3	1	2	0	3	1	0	1	1	0	3
		33%	67%	0%	100%	33%	67%	0%	100%	33%	0%	33%	33%	0%	100%
	Postgraduate	11	28	15	54	21	24	9	54	1	16	7	14	16	54
		20%	52%	28%	100%	39%	44%	17%	100%	2%	30%	13%	26%	30%	100%

N: Never, S: Sometimes, A: Always, SD: Strongly disagree, D: Disagree, ND-NA: Nor disagree neither agree, A: Agree, SA: Strongly agree

Chi-square tests were used to analyze the relationships between product purchases and demographics via SPSS. Table 3 shows associations between diet-related foods and gender, marital status, number of children, and disability status; baby products with marital status and number of children; cosmetics, +18, and women-specific products with gender and marital status; and veterinary products with age.

Table 3. Relationship between pharmacy products and participants' demographic characteristics

Pharmacy products	Demographic characteristics						
	Age	Gender	Marital status	Number of children	Education	Health insurance	Disability
Herbal products	0.806 NO	0.44 NO	0.077 NO	0.713 NO	0.092 NO	0.387 NO	0.834 NO
Diet foods (slimming)	0.284 NO	0.015 YES	0 YES	0.001 YES	0.948 NO	0.819 NO	0.024 YES
Baby products	0.205 NO	0.612 NO	0 YES	0 YES	0.992 NO	0.879 NO	0.774 NO
Food supplements	0.444 NO	0.336 NO	0.054 NO	0.015 YES	0.997 NO	0.2 NO	0.612 NO
Chemical substance	0.141 NO	0.076 NO	0.084 NO	0.088 NO	0.844 NO	0.534 NO	0.581 NO
Veterinary medicinal products	0.001 YES	0.05593 NO	0.102 NO	0.924 NO	0.976 NO	0.405 NO	0.813 NO
Cosmetic products	0.864 NO	0 YES	0.035 YES	0.179 NO	0.836 NO	0.972 NO	0.785 NO
Medical supplies	0.46 NO	0.671 NO	0.931 NO	0.955 NO	0.214 NO	0.08 NO	0.93 NO
+18 products	0.184 NO	0 YES	0 YES	0.385 NO	0.567 NO	0.9 NO	0.878 NO
Special products for women	0.582 NO	0 YES	0.045 YES	0.316 NO	0.946 NO	0.841 NO	0.877 NO

Table 4 highlights the relationship between online shopping frequency and demographics. The frequency of online access is linked to the number of children and health insurance status. Internet use via phone is correlated with age, number of children, education, and disability status. The active use of phone applications is associated with education and disability status. Online shopping frequency is linked to gender, marital status, number of children, education, and health insurance. E-government use is associated with age and education. E-prescription satisfaction correlates only with education. Awareness of e-pharmacy is linked to marital and educational status. Convenience in e-pharmacy and purchasing prescription medicines online are associated with education. Shopping for nonprescription products online is correlated with age and disability status. The association between medicine purchase and digital engagement (internet, e-government usage) is consistent with findings in Oman and Hungary, where perceived ease-of-access and trust in digital systems were key predictors of e-pharmacy use [24,26].

Table 4. Relationships between the frequency of online shopping and the demographic characteristics of the participants

Frequency of online shopping	Demographic characteristics						
	Age	Gender	Marital Status	Number of children	Education	Health insurance	Disability
Frequency of internet access	0.935 NO	0.129 NO	0.124 NO	0 YES	0.392 NO	0.014 YES	1 NO
Internet usage from the phone	0.008 YES	0.706 NO	0.101 NO	0 YES	0 YES	0.249 NO	0 YES
Active use of phone applications	0.458 NO	0.927 NO	0.716 NO	0.282 NO	0 YES	0.18 NO	0.037 YES
Frequency of online shopping	0.147 NO	0.022 YES	0 YES	0 YES	0.03 YES	0.025 YES	0.052 NO
Frequency of use of e-government system	0.003 YES	0.064 NO	0.073 NO	0.08 NO	0.02 YES	0.084 NO	0.499 NO
E prescription satisfaction	0.225 NO	0.857 NO	0.892 NO	0.593 NO	0 YES	0.362 NO	0.103 NO
Becoming aware of e-pharmacy	0.242 NO	0.762 NO	0.027 YES	0.263 NO	0.011 YES	0.91 NO	0.564 NO
Finding the E pharmacy system appropriate	0.537 NO	0.268 NO	0.237 NO	0.866 NO	0.002 YES	0.561 NO	0.361 NO
E pharmacy shopping (Prescription)	0.607 NO	0.169 NO	0.505 NO	0.185 NO	0.049 YES	0.192 NO	0.053 NO
E pharmacy shopping (without prescription)	0.022 YES	0.791 NO	0.366 NO	0.658 NO	0.46 NO	0.766 NO	0.021 YES

Table 5 summarizes the hypotheses and evaluations. Sickness frequency is associated with gender, with men becoming sick more often. Health insurance type is correlated with health center visits, with SSI users visiting more frequently. Sickness frequency varies by season but is independent of chronic diseases. Important factors for pharmacies include location, price, product range, cleanliness, staff attentiveness, and proximity. Transportation is not seen as problematic. Shopping at multiple pharmacies for unavailable products is considered important. Transportation and sickness frequency are unrelated to online pharmacy shopping, but sickness frequency is related to online shopping for nonprescription medicines. The frequency of internet use does not correlate with online pharmacy shopping, but it does correlate with online shopping for nonprescription orders. Online pharmacy shopping is associated with gynecological, cancer, rheumatic, autoimmune, eye, and ear diseases. E-government use for nonprescription medicines correlates with online pharmacy shopping. This digital engagement aligns with Türkiye's strong e-government infrastructure, particularly in healthcare. For instance, e-Nabız and MHRS systems are widely used for appointments, lab results, and prescriptions. Yet, the exclusion of e-pharmacies from these platforms indicates a disjointed regulatory approach, which contrasts with other digitalized services in Türkiye's health system. Integrating e-pharmacy into this ecosystem could align policy with user expectations and behavior, as evidenced by this study's findings.

Table 5. Summary results of the hypotheses

Hypothesis	Cs	df	AS	A/R
Hypothesis1: Demographic characteristics are not associated with the frequency of illness				
*gender-frequency of illness	27.210	4	0.000	R
*marital status-frequency of illness	0.660	4	0.956	A
*number of children-frequency of illness	16.054	16	0.449	A
*educational status-frequency of illness	20.508	16	0.198	A
*age-frequency of illness	24.141	20	0.236	A
*health insurance-frequency of illness	9.005	12	0.702	A
*disability status-frequency of illness	2.831	4	0.587	A
Hypothesis2: Health insurance type is not related to the frequency of visiting health centers.	30.908	12	0.002	R
Hypothesis3: Season has no relationship with the frequency of getting sick	97.034	16	0.000	R
Hypothesis4: Demographic characteristics are not related to individuals having chronic diseases.				
*gender-chronic illness	4.964	1	0.026	R
*marital status- chronic disease	0.394	1	0.561	A
*number of children-chronic disease	2.047	4	0.600	A
*educational status-chronic disease	2.827	4	0.520	A
*age-chronic disease	3.161	5	0.547	A
*health insurance-chronic illness	3.129	3	0.363	A
*disability-chronic illness	0.331	1	0.547	A
Hypothesis5: Demographic characteristics are not related to the types of products purchased from the pharmacy.	21.902	387	0.000	R
Hypothesis6: Physical pharmacy conditions (transportation, product availability, working hours, etc.) are not significant as a problem	16.417	16	0.423	A
Hypothesis7: There is no relationship between pharmacy transportation and online shopping of pharmacy products.				
*gender-frequency of online shopping	11.479	4	0.022	R
*marital status-frequency of online shopping	21.488	4	0.000	R
*number of children-frequency of online shopping	66.234	16	0.000	R
*educational status-frequency of online shopping	35.721	16	0.003	R
*age-frequency of online shopping	26.609	20	0.147	A
*health insurance-frequency of online shopping	23.301	12	0.025	R
*disability status-frequency of online shopping	9.411	4	0.052	A
*gender-frequency of internet use	9.893	6	0.129	A
*marital status-frequency of internet use	10.023	6	0.124	A
*number of children-frequency of internet use	75.446	24	0.000	R
*educational status-frequency of internet use	25.252	24	0.392	A
*age-frequency of internet use	19.225	30	0.935	A
*health insurance-frequency of internet use	33.649	18	0.014	R
*disability status-frequency of internet use	0.176	6	1.000	A

Table 5. Continued

Hypothesis8: Demographic characteristics are not related to frequency of online shopping and frequency of internet use.	18.355	16	0.304	A
Hypothesis9: There is no relationship between the frequency of being sick and shopping for pharmacy products over the internet				
*Frequency of internet use - shopping for pharmacy products over the internet	24.085	24	0.457	A
*Frequency of shopping on the internet-shopping of pharmacy products on the interne	46.701	16	0.000	R
Hypothesis10: There is no relationship between the frequency of internet use and the frequency of shopping online and the shopping of pharmacy products over the internet	5.148	4	0.445	A
Hypothesis11: There is no relationship between having chronic diseases and shopping for pharmacy products over the internet	53.140	16	0.000	R
Hypothesis12: There is no relationship between the use of e-government and shopping of pharmacy products over the internet	30.908	12	0.002	R
Cs: Chi-square, df: Degree of Freedom, AS: Asymptotic Significance, A: Accepted, R: Rejected				

4. CONCLUSIONS

The e-pharmacy refers to the global practice of ordering and receiving prescription and nonprescription medications through online platforms. This study investigates the necessity and customer demographics of e-pharmacy systems, which are currently restricted in Türkiye because of regulatory constraints on traditional pharmacies and pharmacists. In the case study, 389 individuals were surveyed on various aspects, including demographics, internet usage, views on traditional pharmacies, chronic illnesses, perceptions of e-pharmacy, e-government interaction, and insurance coverage.

Traditional pharmacy preferences typically prioritize location, price, product variety, cleanliness, staff attentiveness, and convenience of access. Conversely, e-pharmacies eliminate the need for physical visits, thus altering criteria such as proximity and convenience. The study revealed that e-pharmacy adoption is correlated with higher education levels, age, and disability status. Users often possess at least a bachelor's degree, are frequent internet users, engage with e-government services, and have more frequent healthcare needs. These findings are in line with Panvelkar et al. [20], who emphasized that patient satisfaction with e-pharmacies is often higher among individuals with higher education and health literacy. Moreover, the preference among disabled users parallels the findings of Bu et al. [14] in China, where digital pharmacies were found to improve access for mobility-impaired populations. Notably, individuals with disabilities show a strong preference for e-pharmacy services. Regarding medication types, while a majority find e-pharmacy suitable for nonprescription items, 80% consider it viable for prescription drugs despite concerns over information security and medication safety. Concerns about information integrity echo the warnings of Bessell et al. [3] and Winker et al. [7], who highlighted the prevalence of low transparency and lack of accreditation in global e-pharmacy websites. This raises the importance of designing a robust national framework tailored for Türkiye. Awareness of e-pharmacy remains low, with only 15% of respondents familiar with the concept and some expressing apprehensions about delivery logistics. Overall, this research underscores the potential and challenges of integrating e-pharmacy into Türkiye's healthcare landscape amidst regulatory and safety considerations. The SWOT framework provides a strategic lens through which the survey results can be contextualized, highlighting priority areas for future digital policy reforms in Türkiye.

This study contributes to the literature by identifying user profiles specific to the Turkish healthcare and digital ecosystem. While most international studies focus on generalized e-commerce behavior, this research offers a culturally and structurally unique case. The demonstrated interest among disabled individuals and younger, educated users may guide targeted policy formulations in countries with similar regulatory bottlenecks. A future framework for e-pharmacy in Türkiye should not only reflect global best practices but also consider alignment with national digital health policies. Revisions to existing legislation, including the Pharmacists and Pharmacies Regulation, and coordinated action from institutions such as TİTCK and the Ministry of Health, would be essential to legalize and regulate e-pharmacy systems while ensuring consumer safety.

In future studies on the e-pharmacy system, the e-pharmacy system framework can be defined specifically for Türkiye. In particular, an appropriate framework can be developed by considering the currently

implemented e-health, e-prescription, and other related services in e-government. One of the limitations of this study lies in the demographic concentration of the sample, particularly the overrepresentation of younger participants and women. This imbalance may restrict the generalizability of the findings across the entire population. Future studies should aim to achieve a more balanced sample in terms of age, gender, and socioeconomic status to better represent the diverse profiles affected by e-pharmacy policies. The authors would like to conduct another study in the future to compare the results by reapplying the questionnaire to the participants.

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