



RESEARCH

Influence of health literacy on primary healthcare utilization

Sağlık okuryazarlığının birinci basamak sağlık hizmeti kullanımı üzerindeki etkisi

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Abstract

Purpose: This study aims to evaluate the health literacy levels of individuals presenting to the emergency department with non-life-threatening and ambulatory care-appropriate conditions, and to investigate the relationship between health literacy defined as the ability to access, understand, and apply health information and primary care utilization.

Materials and Methods: A cross-sectional analytical study was conducted between May and October 2023 at the green triage section of Izmir Ataturk Training and Research Hospital emergency department. A total of 326 participants were included. Health literacy was assessed using validated Turkish versions of REALM and NVS instruments. Sociodemographic data and healthcare utilization habits were collected via face-to-face interviews.

Results: A total of 81.5% of participants did not consult a family physician prior to their ED visit. According to REALM, 71.2% of participants had adequate health literacy, while this rate was 44.9% according to NVS. Chronic illness was reported by 43.7%, and 36.9% were on regular medication. Frequent family physician utilization was higher among women (57.8%), those with higher education (34.6% with university or higher), health insurance coverage (77.9%), chronic disease (43.7%), and regular medication use (36.9%). Health insurance increased the likelihood of family physician visits by 2.9 times, and regular medication use increased it by 3 times.

Conclusion: Many emergency department visits could be managed at the primary care level. Enhancing health literacy particularly functional literacy, which involves individuals' ability to understand, interpret, and effectively apply health information in real-life situations and improving access to and the perception of family medicine services may help reduce potentially avoidable emergency department visits and contribute to more efficient health service delivery.

Keywords: Health literacy, emergency department, family medicine, primary care utilization.

Öz

Amaç: Bu çalışmanın amacı, acil servise hayatı tehlige içermeyen ve ayaktan tedavi edilebilecek nedenlerle başvuran bireylerin sağlık okuryazarlığı düzeylerini sağlık bilgilerine ulaşma, anlama ve uygulama becerisi olarak tanımlanan sağlık okuryazarlığı değerlendirmek ve sağlık okuryazarlığı ile birinci basamak sağlık hizmeti kullanım sıklığı arasındaki ilişkiyi incelemektir.

Gereç ve Yöntem: Kesitsel analitik tasarıma sahip bu çalışma, Mayıs-Ekim 2023 tarihleri arasında İzmir Ataturk Eğitim ve Araştırma Hastanesi'nin acil servis yeşil alan bölümünde gerçekleştirilmiştir. Çalışmaya 326 katılımcı dahil edilmiştir. Sağlık okuryazarlığı, Türkçe geçerliliği yapılmış REALM ve NVS ölçekleriyle değerlendirilmiştir. Katılımcıların sosyodemografik özellikleri ve sağlık hizmeti kullanımları yüz yüze görüşmelerle toplanmıştır.

Bulgular: Katılımcıların %81,5'i acil servis başvurusu öncesinde aile hekimine başvurmayı yapmadır. REALM'a göre katılımcıların %71,2'si yeterli sağlık okuryazarlığına sahipken, NVS'ye göre bu oran %44,9'dur. Katılımcıların %43,7'sinde kronik hastalık mevcut olup %36,9'u düzenli ilaç kullanmaktadır. Aile hekimine başvuru sıklığı, kadın cinsiyet (%57,8), yüksek eğitim düzeyi (%34,6 üniversite ve üzeri), sağlık güvencesi varlığı (%77,9), kronik hastalık (%43,7) ve düzenli ilaç kullanımı (%36,9) ile daha yüksek bulunmuştur. Sağlık güvencesine sahip olanların aile hekimine başvuru olasılığı 2,9 kat, düzenli ilaç kullananların ise 3 kat artmıştır.

Sonuç: Acil servise yapılan birçok başvuru birinci basamakta karşılanabilir durumdadır. Bireylerin sağlık bilgilerini gerçek yaşam durumlarında anlama, yorumlama ve etkili bir şekilde uygulama becerisini içeren işlevsel sağlık okuryazarlığının artırılması ve aile hekimliği hizmetlerinin erişilebilirliği ile algısının iyileştirilmesi, önlenenebilir acil servis başvurularının azaltılmasına ve sağlık hizmet sunumunun etkinliğinin artırılmasına katkı sağlayabilir.

Anahtar kelimeler: Sağlık okuryazarlığı, acil servis, aile hekimliği, birinci basamak sağlık hizmeti kullanımı.

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INTRODUCTION

The Health Transformation Program, initiated in 2003, marked a comprehensive and fundamental reform movement within Turkey's healthcare system¹. This reform process aimed to enhance the accessibility, continuity, and quality of healthcare services, ensure financial sustainability, and strengthen equity in healthcare delivery². One of the key components of this transformation was the nationwide implementation of the family medicine model in 2010. The family medicine system was structured to serve as the first point of contact for individuals, providing a broad spectrum of primary care services including preventive health care, chronic disease management, immunizations, screening programs, and basic medical treatments³. Family physicians serve as primary providers of both preventive and curative care, offering holistic assessments of individuals' and families' medical and social needs. However, limited public awareness of family medicine services in certain segments of the population continues to hinder the effective utilization of these services⁴.

In this context, health literacy has emerged as a key determinant, defined as individuals' cognitive and social skills that enable them to acquire, understand, evaluate, and apply health-related information in their daily lives⁵. Individuals with adequate health literacy are better equipped to navigate the healthcare system, comprehend complex medical information, and participate actively in decision-making processes regarding their health. Health literacy not only influences individual health outcomes but also directly affects the utilization, cost, and overall efficiency of healthcare services at the population level. Importantly, low health literacy is no longer an issue unique to Turkey; it has become a widespread barrier to effective primary healthcare utilization across many health systems, particularly in OECD countries.

Despite the potential of primary care to address many common and non-life-threatening health issues, many individuals underutilize these services and instead prefer to seek care directly from emergency departments. Even for routine needs such as prescription renewals, mild upper respiratory tract infections, or conditions requiring basic consultations, patients often bypass primary care and visit emergency services, leading to imbalances in

resource allocation and unnecessary overcrowding in emergency departments. The literature suggests that health literacy levels may influence individuals' healthcare-seeking behaviors; skills such as appointment scheduling, comprehension of educational materials, adherence to referral pathways, and appropriate service utilization are closely linked to individuals' health literacy capacities⁶.

Various instruments used to assess health literacy capture different dimensions of this construct. While some tests focus primarily on medical vocabulary recognition and terminology familiarity, instruments such as the Newest Vital Sign (NVS) evaluate functional health literacy, measuring individuals' ability to interpret, process, and apply health information in real-life situations. This functional dimension may be particularly important for understanding individuals' ability to navigate the healthcare system and select appropriate levels of care.

Accordingly, the present study aims to assess the health literacy levels of individuals presenting to emergency departments for non-life-threatening reasons with a particular emphasis on functional health literacy and to examine the relationship between health literacy and the frequency of primary care utilization.

This study is one of the few investigations in Turkey that simultaneously assesses both medical terminology recognition and functional health literacy among emergency department patients, and examines their relationship with primary care utilization. By focusing particularly on functional health literacy, it contributes to the literature on managing emergency department visits through primary care services.

It is hypothesized that individuals with adequate health literacy are more likely to utilize primary care services and less likely to make unnecessary emergency department visits.

MATERIALS AND METHODS

Sample

The study included individuals aged 18 years or older who were literate, presented to the emergency department with non-life-threatening and ambulatory care-appropriate conditions, and provided both written and verbal informed consent. Exclusion

criteria were refusal to participate, being under 18 years of age, illiteracy, or provision of incomplete data.

The sample size was calculated using the OpenEpi sample size calculator. Based on 2018 data from the Turkish Ministry of Health, the prevalence of inadequate health literacy was assumed to be 31%. With a 95% confidence level and a 5% margin of error, the minimum required sample size was determined as 326 participants. A total of 400 patients were approached for participation. Of these, 55 declined to participate, and 19 were excluded due to incomplete data. Consequently, 326 participants were included in the final analysis, resulting in a participation rate of 81.5%.

Procedure

This cross-sectional analytical study was conducted with the approval of the Non-Interventional Research Ethics Committee of İzmir Katip Çelebi University Faculty of Medicine (approval date: April 27, 2023; file number: 0186). The study took place between May and October 2023 in the green triage area of the emergency department at Ataturk Training and Research Hospital, a tertiary education and research hospital with approximately 400,000 annual emergency department visits. The hospital employs an electronic health record system, and patient files are regularly audited to ensure data reliability. Data collection was carried out through face-to-face interviews by two trained researchers who had received specific training in health literacy assessment and followed a standardized protocol.

Data collection

Health literacy was assessed using two validated instruments: the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Newest Vital Sign (NVS). Sociodemographic data, health status, and healthcare utilization habits were also collected through a structured questionnaire developed by the researchers. All data were obtained via face-to-face interviews to minimize misunderstandings and ensure reliable communication. The interviews, conducted by two trained researchers following a standardized procedure, lasted approximately 20 minutes. To ensure confidentiality, data were anonymized and securely recorded.

The REALM instrument evaluates individuals' familiarity with medical terminology. Participants

were asked to read aloud a list of 66 commonly used health-related words, and one point was awarded for each word correctly pronounced. The total score ranges from 0 to 66, with higher scores indicating greater familiarity with medical terminology. Based on established cut-off values, scores between 0 and 18 were classified as inadequate health literacy, 19 to 44 as marginal, 45 to 60 as basic, and 61 to 66 as adequate.

The NVS instrument assesses functional health literacy, focusing on individuals' ability to understand, interpret, and apply health-related information in real-life contexts. Participants were presented with a nutrition label and asked six questions designed to evaluate reading comprehension, numeracy, and interpretation skills. Each correct response was awarded one point, with a total score ranging from 0 to 6. Scores of 0 to 1 indicated inadequate functional health literacy, 2 to 3 indicated moderate, and 4 to 6 indicated adequate functional health literacy.

Statistical analysis

Data analysis was performed using IBM SPSS Statistics Version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics were presented as frequency (n), percentage (%), mean \pm standard deviation ($\bar{x} \pm SD$), median (M), minimum (min), and maximum (max). The normality of numerical variables was assessed using the Shapiro-Wilk test. For non-normally distributed numerical variables, comparisons between two independent groups were performed using the Mann-Whitney U test (e.g., age and annual number of ED visits by frequency of family physician utilization). Associations between categorical variables were analyzed using the Chi-square test (e.g., gender, education level, health insurance, chronic disease, regular medication use with family physician utilization). Correlations between total scores of health literacy instruments and healthcare utilization variables (family physician visits and ED visits) were assessed using Spearman's rank correlation coefficient. To identify independent predictors of frequent family physician utilization (≥ 3 vs. < 3 visits), a multivariable binary logistic regression analysis was conducted. Variables included in the model were gender, age, education, health insurance status, chronic disease, regular medication use, smoking, alcohol consumption, regular physical activity, health literacy levels, and number of ED visits. Model fit was assessed using the Hosmer-

Lemeshow test, and explanatory power was reported with Nagelkerke R². A p-value <0.05 was considered statistically significant. Variables included in the logistic regression model were selected based on two criteria: previous evidence from the literature indicating their potential association with family physician utilization, and variables with a p-value <0.20 in univariate analyses. This approach ensured that relevant predictors were not excluded at the initial stage while avoiding overfitting.

RESULTS

Out of the 326 participants included in the study, 53.1% were female. The mean age was 40.48 ± 15.81 years, with a range of 18 to 80 years. A majority of participants (68.1%) were under the age of 50. The mean height was 168.55 ± 8.89 cm, mean weight was 71.79 ± 15.20 kg, and mean body mass index (BMI) was 25.19 ± 4.59 kg/m². In terms of educational attainment, 35% of participants had completed primary school or less, 30.4% had completed high school, and 34.6% had a university degree or higher. The majority (77.9%) had health insurance coverage, and 54.3% were married. Regarding income, 31.6% of participants reported income lower than their expenses, 53.4% reported equal income and expenses, and 15% had income higher than their expenses. The perceived quality of life was rated as moderate by the largest proportion (63.2%). Among the participants, 43.6% were smokers, 33.4% consumed alcohol, and 28.9% reported engaging in regular physical activity. Known chronic illness was reported by 43.7%, while 36.9% reported regular use of medication. The most common sources of health information were physicians (50.5%) and the internet (35.7%). The most frequently reported reason for ED visits was gastrointestinal complaints (38%). A large proportion of complaints (44.5%) had lasted for less than one day. Notably, 81.5% of participants had not consulted their family physician prior to visiting the ED. The most common reason cited for not consulting a family physician was the perception of inadequacy in the service (24.2%). In the past year, participants visited the ED an average of 5.12 ± 5.74 times and consulted their family physician an average of 3.45 ± 4.80 times.

Health literacy levels of the participants were assessed using the REALM and NVS scales. According to the data presented in Table 2, the mean total REALM score was 60.25 ± 10.10 . Based on categorical classification, 1.5% of the participants had

inadequate, 4.9% had marginal, 22.4% had basic, and 71.2% had adequate health literacy levels. The mean total NVS score was 3.05 ± 1.63 . According to the NVS categories, 20.0% of participants had inadequate, 35.1% had moderate, and 44.9% had adequate health literacy. A statistically significant positive correlation was found between the total scores of the REALM and NVS scales ($\rho = 0.356$, $p < 0.001$). This result indicates a moderate relationship between the two measurements.

Significant differences were observed between family physician utilization and certain sociodemographic and health-related characteristics. Women were more likely to visit family physicians than men, and higher educational attainment as well as the presence of health insurance were associated with increased utilization ($p < 0.05$). Married individuals were also more likely to visit family physicians, as were those who engaged in regular physical activity and those who did not consume alcohol ($p < 0.05$). Furthermore, individuals with chronic illnesses and those on regular medication reported significantly higher rates of family physician visits ($p < 0.001$). In contrast, no statistically significant association was found between family physician utilization and variables such as age, height, weight, body mass index, income level, reason for ED visit, sources of health-related information, health literacy levels, duration of symptoms, or prior consultation with a family physician before the ED visit. No statistically significant association was found between health literacy levels and the frequency of family physician visits. Analyses using both the REALM and NVS instruments revealed no significant differences in family physician utilization across health literacy categories ($p > 0.05$). However, the number of ED visits in the past year was significantly higher among those who reported frequent family physician utilization ($p = 0.011$).

According to the results presented in Table 4, health insurance status, regular medication use, and the number of ED visits in the past year were found to be statistically significant predictors of the frequency of family physician visits. Specifically, individuals with health insurance were 2.850 times more likely to have visited a family physician more than three times. Similarly, those who reported regular medication use were 3.020 times more likely to do so, while each additional ED visit in the past year increased the likelihood of frequent family physician visits by 1.089 times.

Table 1. Distribution of sociodemographic characteristics and health-related variables

Variables	Statistics
Gender, <i>n</i> (%)	
Female	173 (53.1)
Male	153 (46.9)
Age	
$\bar{x} \pm ss$	40,48±15,81
<i>M</i> (min-max)	38 (18-80)
Age Categories, <i>n</i> (%)	
Under 50 years	222 (68.1)
50-65 years	80 (24.5)
Over 65 years	24 (7.4)
Height, (cm)	
$\bar{x} \pm ss$	168,55±8,89
<i>M</i> (min-max)	169 (145-200)
Weight, (kg)	
$\bar{x} \pm ss$	71,79±15,20
<i>M</i> (min-max)	70 (39-175)
BMI, (kg/m ²)	
$\bar{x} \pm ss$	25,19±4,59
<i>M</i> (min-max)	24,78 (12,88-60,55)
Educational Level, <i>n</i> (%)	
Primary school or below	114 (35,0)
High school	99 (30,4)
University or higher	113 (34,6)
Health Insurance Status, <i>n</i> (%)	
None	72 (22,1)
Present	254 (77,9)
Marital Status, <i>n</i> (%)	
Single	149 (45,7)
Married	177 (54,3)
Income Level, <i>n</i> (%)	
Poor (Income less than expenses)	103 (31,6)
Average (Income equal to expenses)	174 (53,4)
Good (Income greater than expenses)	49 (15,0)
Perceived Quality of Life, <i>n</i> (%)	
Low	91 (27,9)
Moderate	206 (63,2)
High	29 (8,9)
Smoking, <i>n</i> (%)	
No	184 (56,4)
Yes	142 (43,6)
Alcohol, <i>n</i> (%)	
No	217 (66,6)
Yes	109 (33,4)
Regular Exercise, <i>n</i> (%)	
No	231 (71,1)
Yes	95 (28,9)

Do you have any known chronic illness?	
No	183 (56.3)
Yes	143 (43.7)
Do you regularly use any medication?	
No	205 (63.1)
Yes	121 (36.9)
Where do you obtain health-related information?	
TV, radio, newspaper, magazines, etc.	33 (10.1)
Internet	116 (35.7)
Doctor	164 (50.5)
Other	13 (3.7)
What is your chief complaint in this emergency department visit?	
Gastrointestinal	124 (38.0)
Genitourinary	13 (4.0)
Neuropsychiatric	44 (13.5)
Cardiovascular	25 (7.7)
Respiratory	68 (20.7)
Musculoskeletal	21 (6.5)
Skin and mucosal	10 (3.1)
Other	13 (4.0)
Asymptomatic	8 (2.5)
Duration of Symptoms	
<1 day	144 (44.5)
1-14 days	140 (43.3)
15-30 days	16 (4.4)
>30 days	26 (7.8)
Did you consult your family physician before visiting the ED?	
No	265 (81.5)
Yes	61 (18.5)
Why didn't you visit your family physician?	
It didn't occur to me	15 (4.6)
I find them inadequate	79 (24.2)
I work at a hospital	46 (14.1)
I thought they wouldn't be interested	41 (12.6)
I found ED more appropriate	29 (8.9)
Easier access	45 (13.8)
Out of working hours	44 (13.5)
The pain was severe	16 (4.9)
Sudden onset of pain	5 (1.6)
I was a visitor/guest	6 (1.8)
How many times did you visit the emergency department in the last year?	
$\bar{x} \pm ss$	5.12 \pm 5.74
M (min-max)	3 (0-50)
How many times did you visit your family physician in the last year?	
$\bar{x} \pm ss$	3.45 \pm 4.80
M (min-max)	2 (0-40)

\bar{x} = Mean; SD = Standard Deviation; M = Median; BMI = Body Mass Index; ED = Emergency Department.

Table 2. Distribution of health literacy levels (REALM and NVS)

Variables	n	%
REALM Total Score		
$\bar{x} \pm ss$	60.25±10.10	
M (min-max)	64 (0-66)	
REALM Categories		
Inadequate	5	1.5
Marginal	16	4.9
Basic	73	22.4
Adequate	232	71.2
NVS Total Score		
$\bar{x} \pm ss$	3.05±1.63	
M (min-max)	3 (0-6)	
NVS Categories *		
0–1 points: Inadequate Health Literacy	65	20.0
2–3 points: Moderate Health Literacy	115	35.1
4–6 points: Adequate Health Literacy	146	44.9
		REALM Total Score
NVS Total Score	<i>rho</i>	0.356
	<i>p</i>	<0.001

\bar{x} = Mean; SD = Standard Deviation; M = Median; REALM = Rapid Estimate of Adult Literacy in Medicine; NVS = Newest Vital Sign; rho = Spearman correlation coefficient.

Table 3. Comparison of sociodemographic and health characteristics according to frequency of family physician visits

Variables	Family Physician Visit		Test Statistics	
	3 or less	More 3	Test Value	<i>p</i>
Gender, n (%)				
Female	102 (59.0)	71 (41.0)	$\chi^2=4.790$	0.029
Male	108 (70.6)	45 (29.4)		
Age				
$\bar{x} \pm ss$	39.30±14.64	42.62±17.61	$\tilde{z}=1.267$	0.205
M (min-max)	37 (18-75)	42 (18-80)		
Age Categories, n (%)				
Under 50 years	152 (68.5)	70 (31.5)	$\chi^2=5.018$	0.081
50–65 years	45 (56.3)	35 (43.7)		
Over 65 years	13 (54.2)	11 (45.8)		
Height, (cm)				
$\bar{x} \pm ss$	169.20±8.81	167.36±8.93	$\tilde{z}=1.889$	0.059
M (min-max)	169 (145-200)	168 (150-192)		
Weight, (kg)				
$\bar{x} \pm ss$	72.47±15.87	70.57±13.90	$\tilde{z}=1.264$	0.206
M (min-max)	72 (39-175)	68 (42-110)		
BMI, (kg/m ²)				
$\bar{x} \pm ss$	25.34±4.84	25.11±4.12	$\tilde{z}=0.110$	0.912
M (min-max)	24.80 (12.88-60.55)	24.73 (15.43-42.97)		
Educational Level, n (%)				
Primary school or below	60 (52.6)	54 (47.4)	$\chi^2=11.228$	0.004
High school	72 (73.2)	27 (26.8)		
University or higher	78 (69.0)	35 (31.0)		
Health Insurance Status, n (%)				
None	57 (79.2)	15 (20.8)	$\chi^2=8.771$	0.003
Present	153 (60.2)	101 (39.8)		

Marital Status, <i>n</i> (%)				
Single	105 (70.5)	44 (29.5)	$\chi^2=4.386$	0.036
Married	105 (59.3)	72 (40.7)		
Income Level, <i>n</i> (%)				
Poor (Income less than expenses)	64 (62.1)	39 (37.9)	$\chi^2=0.438$	0.803
Average (Income equal to expenses)	113 (64.9)	61 (35.1)		
Good (Income greater than expenses)	33 (67.3)	16 (32.7)		
Perceived Quality of Life, <i>n</i> (%)				
Low	48 (52.7)	43 (47.3)	7.669	0.022
Moderate	143 (69.4)	63 (30.6)		
High	19 (65.5)	10 (34.5)		
Smoking, <i>n</i> (%)				
No	117 (63.6)	67 (36.4)	0.127	0.722
Yes	93 (65.5)	49 (34.5)		
Alcohol, <i>n</i> (%)				
No	129 (59.4)	88 (40.6)	6.994	0.008
Yes	81 (74.3)	28 (25.7)		
Regular Exercise, <i>n</i> (%)				
No	159 (68.8)	72 (31.2)	7.120	0.008
Yes	51 (53.6)	44 (46.4)		
Do you have any known chronic illness?				
No	138 (75.4)	45 (24.6)	22.492	<0.001
Yes	72 (50.3)	71 (49.7)		
Do you regularly use any medication?				
No	154 (75.1)	51 (24.9)	28.289	<0.001
Yes	56 (45.8)	65 (54.2)		
Where do you obtain health-related information?				
TV, radio, newspaper, magazines, etc.	20 (60.6)	13 (39.4)	2.525	0.471
Internet	80 (69.0)	36 (31.0)		
Doctor	103 (62.8)	61 (37.2)		
Other	7 (53.8)	6 (46.2)		
What is your chief complaint in this emergency department visit?				
Gastrointestinal	78 (63.4)	46 (36.6)	8.002	0.433
Genitourinary	7 (53.8)	6 (46.2)		
Neuropsychiatric	29 (65.9)	15 (34.1)		
Cardiovascular	11 (44.0)	14 (56.0)		
Respiratory	47 (70.1)	21 (29.9)		
Musculoskeletal	16 (76.2)	5 (23.8)		
Skin and mucosal	7 (70.0)	3 (30.0)		
Other	9 (69.2)	4 (30.8)		
Asymptomatic	6 (75.0)	2 (25.0)		
Duration of Symptoms				
<1 day	92 (63.9)	52 (36.1)	2.345	0.504
1-14 days	94 (67.1)	46 (32.9)		
15-30 days	11 (71.4)	5 (28.6)		
>30 days	13 (50.0)	13 (50.0)		
Did you consult your family physician before visiting the ED?				
No	174 (65.7)	91 (34.3)	1.144	0.285
Yes	36 (59)	25 (41)		
How many times did you visit the emergency department in the last year?				
$\bar{x} \pm ss$	4.15±3.79	6.92±7.91	$\approx=2.547$	0.011
<i>M</i> (min-max)	3 (0-20)	5 (0-50)		
REALM categories				
Inadequate	4 (80.0)	1 (20.0)	4.146	0.246
Marginal	7 (43.7)	9 (56.3)		
Basic	45 (61.6)	28 (38.4)		
Adequate	154 (66.4)	78 (33.6)		

NVS categories*					
0–1 points: Inadequate Health Literacy	44 (66.7)		21 (33.3)	1.691	0.429
2–3 points: Moderate Health Literacy	69(60)		46 (40)		
4–6 points: Adequate Health Literacy	97 (66.4)		49 (33.6)		

* = Mean; SD = Standard Deviation; M = Median; χ^2 = Chi-square test statistic; z = Mann–Whitney U test statistic; REALM = Rapid Estimate of Adult Literacy in Medicine; NVS = Newest Vital Sign; ED = Emergency Department.

Table 4. Logistic regression analysis of factors associated with frequency of family physician visits

	β	Standard deviation	Wald Statistics	<i>P</i>	Odds Ratio	95% Confidence Interval for Odds Ratio	
						Lower Limit	Upper Limit
Constant	-5.492	0.908	36.556	<0.001	0.004		
Health insurance	1.047	0.367	8.122	0.004	2.850	1.387	5.856
Regular medication use	1.105	0.260	18.109	<0.001	3.020	1.813	5.030
Number of emergency department visits in the past year	0.086	0.024	12.668	<0.001	1.089	1.039	1.142

Variables Included in the Model: Health insurance, marital status, perceived quality of life, alcohol use, regular exercise, known chronic illness, regular medication use, reason for not visiting the family physician, number of emergency department visits in the past year, REALM score, NVS total score.
 Model Statistics: Hosmer and Lemeshow Test $\chi^2=4.608$; *p*=0.708; Nagelkerke R²=0.218
 Elimination Method: Backward-Wald

β = Regression coefficient; SD = Standard Deviation; CI = Confidence Interval; OR = Odds Ratio; REALM = Rapid Estimate of Adult Literacy in Medicine; NVS = Newest Vital Sign; ED = Emergency Department.

DISCUSSION

In the last decade, EDs worldwide have experienced a significant increase in patient visits. In some healthcare systems, this rise has reached levels considered critical overcrowding⁷. Although the causes of ED crowding are multifactorial, the increasing patient volume is often cited as a primary determinant⁸. Findings from this study indicate that the ED is frequently used as a substitute for primary care services. Notably, 81.5% of participants reported not consulting a family physician before presenting to the ED. This trend is not unique to Turkey; similar patterns have been widely documented in international literature. It has been reported that in certain centers, non-urgent visits may account for up to 95% of total ED admissions⁹.

These data underscore that the issue is not merely regional, but rather a significant global challenge in healthcare service utilization. In this context, the role of non-urgent patients in ED overcrowding emerges as a critical and contested topic concerning both resource efficiency and the sustainability of health service delivery systems¹⁰.

In this study, health literacy was assessed using the REALM and NVS tools. The proportion of individuals with adequate literacy was 71.2% according to REALM, while it was 44.9% according to the NVS. Such discrepancies are commonly attributed to the differing dimensions evaluated by these tools. While REALM mainly measures familiarity with medical terminology, NVS evaluates functional health literacy, including the ability to understand and apply health-related information. Indeed, the international literature emphasizes that inadequate health literacy rates tend to be higher when measured by NVS¹¹. This suggests an important implication for public health policy: efforts to promote primary care utilization and improve healthcare access must focus not only on increasing knowledge but also on enhancing individuals' ability to comprehend and apply health information. Therefore, initiatives aimed at improving health literacy should be supported not only by brochures and informational meetings but also through interactive and practical educational models.

In this study, significant associations were found between family physician utilization and the presence of health insurance, regular medication use, and

frequency of ED visits. Individuals with health insurance were 2.85 times more likely to visit a family physician, and those on chronic medication were 3.02 times more likely to do so. These findings suggest that primary care services are more frequently used by individuals integrated into the healthcare system and those with chronic illnesses. Literature also supports that individuals with chronic conditions often consult family physicians for prescription refills or routine check-ups^{12,13}. In our study, no independent and direct association was found between health literacy levels and primary care utilization. Several potential explanations may account for this finding. First, health literacy is a multidimensional construct encompassing various components such as information access, comprehension, interpretation, and decision-making. The instruments used in this study REALM and NVS assess different subdomains of health literacy. While REALM primarily focuses on medical terminology recognition and reading ability, NVS evaluates functional health literacy, specifically the capacity to interpret and apply health information in real-life contexts. These differences in measurement may limit the ability to fully capture behavioral influences on healthcare utilization. Additionally, factors such as participants' insurance status, presence of chronic diseases, and regular medication use may have exerted stronger influences on healthcare-seeking behaviors. Therefore, health literacy may not act as an isolated determinant but should be considered alongside structural and individual factors within the healthcare system. Nevertheless, it has been widely reported that individuals without health insurance tend to rely more heavily on ED services¹⁴. This highlights the critical role of insurance coverage in accessing primary care. Hence, expanding insurance coverage and strengthening chronic disease management policies could enhance the use of primary care services.

In our study, the number of ED visits in the past year was significantly higher among individuals who reported frequent utilization of family physician services. This may be associated with the fact that individuals with chronic illnesses generally have greater healthcare needs, leading to more frequent use of both primary care and emergency services. Additionally, individuals who are generally more inclined to utilize healthcare services may exhibit higher numbers of both primary care and ED visits, regardless of the severity of their health problems. Therefore, frequent use of both services may reflect

not only disease burden but also a general healthcare-seeking behavior. Further research is needed to better elucidate the underlying factors contributing to this dual utilization pattern.

Other factors such as educational level, marital status, perceived quality of life, alcohol use, and exercise habits were also significantly associated with family physician visits. Individuals with higher education levels tended to use primary care services more frequently. Literature suggests this may be due to improved navigation skills within the healthcare system and increased trust in primary care providers as education levels rise¹⁵. Married individuals were also more likely to utilize primary care services, possibly due to the mutual support in health-related decision-making, a finding consistent with prior studies^{16,17}. Those who engaged in regular physical activity also reported more frequent use of primary care, which may reflect heightened health awareness and a tendency to seek preventive care. Conversely, individuals who consumed alcohol were less likely to consult a family physician, which may indicate that risky health behaviors negatively influence healthcare-seeking behavior.

In our study, functional health literacy levels assessed by NVS were found to be lower compared to the results obtained with REALM. This finding highlights that increasing knowledge alone may not be sufficient; individuals also need to develop the ability to comprehend, interpret, and apply health information effectively. Therefore, interventions aiming to improve health literacy should place particular emphasis on enhancing functional health literacy. Such interventions should incorporate active participation methods, including practical trainings, visual materials, interactive programs, and counseling services.

In light of these findings, it is essential to expand community-based educational programs aimed at improving health literacy, particularly functional literacy. Such educational programs should not only focus on knowledge dissemination but also incorporate interactive applications, case-based training modules, and community-based interventions designed to improve participants' ability to apply health information in real-life scenarios. In addition, digital platforms and personalized counseling programs aiming to enhance health literacy have also been shown to be effective approaches. Interventions that strengthen individuals' ability to utilize primary care services are

of great importance. Enhancing the accessibility and appeal of the family medicine system may reduce the tendency to seek care directly from EDs. Literature indicates that interventions improving access to primary care can significantly decrease ED visits¹⁸⁻²⁰. Additionally, eliminating barriers to access for uninsured individuals may increase family physician utilization. Targeted interventions for individuals with lower education levels and public health awareness campaigns especially in rural areas should emphasize the importance of primary care.

This study demonstrated that a substantial proportion of individuals presenting to the emergency department for non-life-threatening conditions did not adequately utilize primary care services. Health insurance status, regular medication use, and the frequency of emergency department visits emerged as the main predictors of family physician utilization. Although no direct significant association was found between health literacy levels and primary care utilization, functional health literacy may still have indirect influences on individuals' ability to navigate the healthcare system and select appropriate care levels.

Accordingly, strengthening primary care utilization requires not only community-based health literacy enhancement programs but also structural interventions such as expanding the accessibility and operating hours of family physician services and simplifying appointment systems. Furthermore, incorporating interactive and practical components into health literacy education programs, integrating health literacy into school curricula, and promoting digital health applications may serve as effective strategies to improve overall healthcare utilization.

This study has certain limitations. Being conducted at a single center may limit the generalizability of the findings. As data were collected through face-to-face interviews based on self-reports, response bias cannot be excluded. Moreover, the REALM and NVS instruments assess only specific dimensions of health literacy. Finally, the cross-sectional design precludes establishing causal relationships between the studied variables.

In conclusion, this study highlights the importance of enhancing functional health literacy and improving the accessibility of primary care services to reduce potentially avoidable emergency department visits. Future research should be conducted in different regions with larger and more diverse populations to

further evaluate the impact of health literacy on primary care utilization. Additionally, the effectiveness of digital health applications, school-based health education, and community-based awareness programs should be investigated, as such interventions may provide valuable guidance for policymakers. These efforts may contribute not only to improving the efficiency of healthcare delivery but also to alleviating unnecessary overcrowding in emergency departments.

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