The Effect of Health Literacy Level on the Use of E-Health Applications

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Abstract: *Purpose*: The purpose of the study is to measure the effect of health literacy (HL) level on the level of use of e-health applications among public employees, excluding health workers serving directly to the public and working in public institutions in the downtown area of Yozgat, Turkey.

Methods: The study is cross-sectional and was conducted in 2021 among public employees. 476 public personnel working in state institutions in the city center participated in the study. Chi-square test, t-test, ANOVA, and multinomial logistic regression were used to evaluate the data.

Results: Of the participants, 64.3% of them were male, 74.9% were married, 45.3% were in the 30-39 age group, and 60.9% were undergraduates. It was observed that 21.5% of the people in the research group had insufficient health literacy (SSL), 41.3% were problematic and 37.2% were sufficient. It was seen that the most used E-health application was E-pulse with 84.9%, followed by Life Fits into Home (LFH) and Central Physician Appointment System (CPAS) (64.3%), and the lowest was the hospitals' online systems (29.1%). The use of E-Nabız (e-Pulse) and E-Devlet (e-Government) SSI applications according to HL level was not found to be statistically significant ($p>0.05$).

Conclusion: The vast majority of public employees use E-Pulse, and approximately 2/3 of them use LFH and CPAS. Less than half of the participants in the study had a sufficient health-literacy level, and the effect on e-Health practices was not found significant.

Keywords: E-health, health literacy, digital health.

1. INTRODUCTION

As in all countries, health literacy (HL) is one of the important issues in Türkiye. Understanding, seeking, and exploiting information in the health field holds a valuable place in health-related decision-making. Information about personal problems, personal care, and most importantly, early diagnosis and prevention of diseases can increase the understanding of personal risk factors and preventive strategies, thus helping to improve their quality of life [1]. In addition, when people's health literacy is improved, it can help them understand their diagnosis, evaluate laboratory results, decide on treatment and predict their prognosis [2].

With the development of health literacy, it is necessary to develop and expand technological equipment that can be easily accessed by everyone so that they can access their data, have information about their health, and follow the information. In this regard, with the help of technology in our country, necessary attempts have been made to enable people to access health-related data such as their diagnoses, diseases, health conditions, vaccination follow-ups, appointment procedures, follow-up drug reports, LFH code follow-ups, and laboratory results, and significant progress has been made [3].

In addition to online transactions, call service is provided for making appointments by telephone (182). These services are considered e-health and are also referred to as digital health. An E-health system is the use of information and technology so that people can access all health-related posts [4].

In a broad definition, it is the use of communication technology and digital information to collect, share and analyze all health data to improve the health of the person and the delivery of the service provided in the health sector [5]. Information such as e-pulse, LFH, and online appointments can be accessed from the e-health system. Medical documentation (appointment, drug information, laboratory results, radiology results, etc.) can be accessed within the E pulse system [6].

We think that health literacy is important for accessing and interpreting information. The study comparing these two factors could not be found in the literature. Therefore, our work is important. Our study aims to determine the relationship between health literacy and using the functions of the e-health system and to contribute to the literature and shed light on it.

In e-Health applications, people must have health literacy to access and interpret information. For people

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to reach something, they must first know that subject. In Türkiye, the e-health system has developed, but it has been observed that there are not enough studies on whether people have information about e-health applications. Therefore, our work is important. E-Nabız (e-Pulse) is Turkey's reliable personal health record system where you can manage your personal health information. Central Physician Appointment System (CPAS) provides examination appointment services to all health institutions and organizations affiliated with the Ministry of Health in Turkey. Life Fits into Home (LFH) mobile application is to inform our citizens about the new Coronavirus (Covid-19) by the Ministry of Health of The Republic of Turkey, It is a mobile application that has been developed to guide and minimize the risks related to the epidemic disease and prevent its spread. ALO 182 (Hi 182) is an application where they can make an appointment with the hospital and doctor, they want from the live operators in Türkiye. E-Devlet (e-Government) means the provision of services provided by the government to citizens in Türkiye in an electronic environment. In this way, it is aimed to deliver state services to the citizens most easily and effectively, in a quality, fast, uninterrupted, and safe manner. It is expected that public employees with a high level of health literacy will use e-health applications more and more frequently.

The study aims to determine the effect of the level of health literacy among public employees on the level of use of e-health applications.

2. MATERIAL AND METHODS

2.1. Type of Research

The study is descriptive and cross-sectional.

2.2. Place and Time of Research

The research was conducted among employees working in public institutions in Yozgat city center in October - December 2021.

2.3. Population and Sample of the Research

The research was conducted among public employees, excluding health workers working in public institutions in Yozgat city center and serving directly to the public. The sample size was calculated with the GPower 3.1 package program. In calculating the minimum sample size, Abacıgil *et al*. (2018) found the rate of those with sufficient health literacy level to be 47% in their study, and based on this rate, p=0.50, α=0.05, and the ratio deviation was 5% d=0. When 05 is taken, it was calculated that at least n=384 people were taken into the sample to find the rate of those with sufficient health literacy level between p=0.45 and 0.55 at the 95% confidence interval. The sample of our research consists of a total of 476 public employees who voluntarily participated in the research, excluding health workers working in public institutions in Yozgat city center and serving directly to the public.

2.4. Variables of the Study

The dependent variable of this study; is the level of use of e-health applications by public employees. The independent variables of this study are; socio-demographic characteristics of public employees, health literacy level, use of social media, internet banking, and e-mail use.

2.5. Data Collection Tools

The data were collected by online filling out the survey forms created on Google forms. The socio-demographic data form prepared by the researcher, the Turkish short form of the European Health Literacy Scale (EHLS-TR-16), and the E-health applications usage form were used as data collection forms.

European Health Literacy Scale (EHLS-TR-16)

The scale was developed within the scope of the European Health Literacy Survey (HLS-EU) between 2009 and 2012, which is aimed at assessing HL.

The standardized index score is used to calculate the total scores obtained from this scale (Index=(meana-1)*(50/3)). The index score ranges from 0 to 50, and those who score 33 or higher on the scale are considered to have a satisfactory level of HL. The validity-reliability study of the scale in Turkey was conducted in 2018 by Emiral *et al.* [7].

2.6. Data Collection

The research was conducted among public employees, excluding health workers, who worked in public institutions in Yozgat city center between October and December 2021 and served directly to the public. Before filling out the questionnaire forms, the participants of the study were given explanatory information about the purpose of the research and evaluation methods.

Consent forms indicating that the participants voluntarily participated in the study, as well as

information about the parameters to be evaluated, were presented to the participants via the Google survey system, and those who gave their consent to participate in the study were allowed to fill out the questionnaires. Online link information of the relevant scales and forms was sent to the personnel of public institutions via public WhatsApp groups.

2.7. Statistical Analysis

The data of the research were evaluated with the SPSS 25.0 program. Tables of ratios and averages of the data were made. The comparison of the ratios according to the independent variables was made using the chi-square test, and the comparison of the arithmetic means was made by applying the -t-test and one-way ANOVA test in independent groups. As dependent variables; The use of e-Pulse, LFH, and SSI health menus has been taken. The independent variables are; The demographic characteristics of the people, the institution they work for, their duties, the presence of chronic diseases, regular drug use, health-related information sources, digital applications they use, and health literacy level were taken.

The e-Pulse menus used were grouped as 0-3, 4-6, and 7-11, and the e-SSI health-related menus were grouped as never using (0), using 1 menu, 2 or more menus, and analyzed by multinomial logistic regression. The $p<0.05$ value was considered significant in the statistical test results.

2.8. Limitations of the Research

The research was web-based among public employees, excluding health workers working in public institutions in Yozgat city center and serving directly to the public. The limitations of the study are that it does not include other segments of society, and those who do not have a digital device and internet access to access the web-based survey cannot participate in the study.

3. RESULTS

64.3% of the participants are male, 74.9% are married, 45.3% are 30-39 years old and 11.1% are 50-64 years old. 60.9% of the individuals are undergraduates, 14% graduate, 13.6% have an associate degree, and 11.5% are high school graduates. Among the relatives of 62.3% of the individuals, some work as health personnel. 18.3% of individuals have a chronic disease, and 21.9% of them regularly use any medication. When the duties of the participants were examined, it was seen that 30.9% of them worked as educators, 22.3% in office jobs, and 12.1% in managerial positions. When the health literacy level of the participants in the study was examined, it was determined that 21.5% had inadequate, 41.3% problematic and 37.2% sufficient HL levels.

It was seen that the most used E-health application was E-pulse with 84.9%, followed by LFH and CPAS (64.3%) with 64.3%, and the least was the online systems of the hospitals with 29.1%. There was no significant difference in terms of the health literacy level of the participants considering the use of any of the e-health applications ($p>0.05$). It was observed that the rate of those with sufficient HL level was the highest among those who used CPAS (38.7%) and the lowest among those who stated that they used their online system (38.8%).

Considering the participants' use of the processes in E-Pulse, the highest 76.8% was My Analysis, the second was My Appointments with 73.8%, then My Prescriptions (53.8), My Diseases (49.8%), My Radiological Images (49.1%), My reports (47.7%), Vaccinations (46.6%) and the lowest 4.5% were my Emergency notes.

Again, when the rates of using CPAS are examined, it is reported that the highest rate is to make a hospital appointment at 83.2%, this is 52.1% to make a vaccination appointment, and the lowest is to use other applications at 3.6%.

None of the e-pulse and CPAS use cases were found to be statistically significant according to the health literacy level of the individuals ($p>0.05$). Considering the purpose of using the HEPP application, it was determined that the highest 80.2% was used to create and query the HEPP code, to see the Covid risk status 51.5%, and to notify with the lowest 3.6%.

Considering the rates of using e-Government SSI transactions, 46.8% do not use any menu, 32.3% use the General health insurance services menu, 15.5% drug report information inquiry menu, and 12.8% Pharmaceuticals. It was stated that they used the duration of use inquiry and Treatment information inquiry menu, 10.4% used the disability report inquiry menu, and the lowest rate was 1.1%, they used the application menu for drugs brought from abroad.

Considering the beneficial status of e-Health applications, the highest rate is E-Pulse with 86.6%,

followed by Online CPAS with 69.8%, the lowest at 26%, Hospitals' own online appointment and information system and 1.7%. None of them are reported to be helpful either (Table **1**).

When the rates of e-Health applications are easy to use, it is reported that E-Pulse is the highest at 78.5%, LFH at wiat8.1% and the lowest is 3.8%, all of them are very difficult to use. Again, when the efficiency of E-Health applications is examined in Table **1**, the highest 81.1% makes it easier for me to make an appointment, it makes it easier for me to benefit from Health services with 70.2%, and the lowest 26.8% makes it easier for me to make the right decisions about my health is reported.

The rate of those who found the e-health applications such as E-Nabız, LFH, Online CPAS, and hospitals' own online appointment and information system useful (36.9-45.9%) of those who participated

Table 1: Practicability of E-Health Applications in Terms of Ease of Use and Usefulness

E-Health Applications Are Useful				Health Literacy Level						X^2
				Insufficient (0-25)		Partially sufficient (>25-33)		Sufficient (>33-50)		
		f	%	f	%	f	%	f	%	P
E-Pulse	No	63	13,4	21	33,3	27	42,9	15	23,8	8,31 0,016
	Yes	407	86,6	80	19,7	167	41,0	160	39,3	
Online appointment and information systems of hospitals	No	348	74,0	80	23	149	42,8	119	34,2	5,49 0,064
	Yes	122	26,0	21	17,2	45	36,9	56	45,9	
LFH	No	151	32,1	44	29,1	57	37,7	50	33,1	7,74 0,021
	Yes	319	67,9	57	17,9	137	42,9	125	39,2	
Online CPAS	No	142	30,2	41	28,9	52	36,6	49	34,5	6,64 0,036
	Yes	328	69,8	60	18,3	142	43,3	126	38,4	
Neither is helpful	No	462	98,3	97	21	192	41,6	173	37,4	3,93 0,140
	Yes	8	1,7	4	50	2	25	2	25	
E-Health Applications Easy to Use										
E-Pulse	No	101	21,5	28	27,7	43	42,6	30	29,7	4,33 0,114
	Yes	369	78,5	73	19,8	151	40,9	145	39,3	
Hospitals' own online appointment and information systems	No	382	81,3	85	22,3	166	43,5	131	34,3	7,63 0,022
	Yes	88	18,7	16	18,2	28	31,8	44	50,0	
LFH	No	150	31,9	45	30	59	39,3	46	30,7	10,18 0,006
	Yes	320	68,1	56	17,5	135	42,2	129	40,3	
Online CPAS	No	187	39,8	52	27,8	72	38,5	63	33,7	7,4 0,025
	Yes	283	60,2	49	17,3	122	43,1	112	39,6	
All very difficult to use	No	452	96,2	93	20,6	188	41,6	171	37,8	6,01 0,05
	Yes	18	3,8	8	44,4	6	33,3	4	22,2	
E-Health Applications Availability Status										
Makes my medical follow-ups easier	No	153	32,6	35	22,9	72	47,1	46	30,1	5,17 0,075
	Yes	317	67,4	66	20,8	122	38,5	129	40,7	
Makes it easier for me to benefit from health services	No	140	29,8	45	32,1	51	36,4	44	31,4	13,47 0,001
	Yes	330	70,2	56	17	143	43,3	131	39,7	
Makes the appointment process easy	No	89	18,9	26	29,2	33	37,1	30	33,7	3,88 0,143
	Yes	381	81,1	75	19,7	161	42,3	145	38,1	
Makes it easier for me to make the right decisions about my health	No	344	73,2	82	23,8	147	42,7	115	33,4	8,94 0,011
	Yes	126	26,8	19	15,1	47	37,3	60	47,6	
It is an application that everyone should use	No	227	48,3	52	22,9	103	45,4	72	31,7	5,78 0,055
	Yes	243	51,7	49	20,2	91	37,4	103	42,4	

LFH: Life Fits into Home, CPAS: Central Physician Appointment System.

in the research with problematic and sufficient health literacy level was compared to those with insufficient health literacy level. It was found to be two times higher than that (17.2-19.7%) ($p<0.05$). According to health literacy level, hospitals' finding their online appointment and information system useful was found to be borderline insignificant ($p=0.064$).

In addition, the rate of those who find the e-health applications with problems and sufficient levels of health literacy easy to use "hospitals' online appointment systems", "LFH", "Online CPAS" (31,8-50%) compared to those with insufficient health literacy level. It is significantly higher than that (17.3-18.2%) ($p<0.05$).

The proportion of individuals who participated in the research with problematic and sufficient health literacy levels said that "it makes it easier to benefit from health services", and "it makes it easier for me to make the

Table 2: E-Pulse Usage by Demographic Characteristics

Demographic features				E Pulse groups						
				1-3 items		4-6 items		7-11 items		X^2
		f	%	f	%	f	%	f	%	P
Gender	Female	168	35,7	55	33,5	62	37,8	47	28,7	0,91 0,633
	Male	302	64,3	106	36,3	114	39	72	24,7	
Age groups	18-29	91	19,4	34	37,4	31	34,1	26	28,6	3,39 0,759
	30-39	213	45,3	75	36,1	80	38,5	53	25,5	
	40-49	114	24,3	36	33	42	38,5	31	28,4	
	50-64	52	11,1	16	33,3	23	47,9	9	18,8	
Marital status	Married	352	74,9	121	35,7	131	38,6	87	25,7	0,15 0,927
	Single	118	25,1	40	34,2	45	38,5	32	27,4	
Education levels	High school	54	11,5	20	40	16	32	14	28	3,06 0,801
	Higher school	64	13,6	21	33,3	25	39,7	17	27	
	Undergraduate	286	60,9	96	34,5	114	41	68	24,5	
	Graduate	66	14	24	36,9	21	32,3	20	30,8	
Number of people live with	1-2 people	119	25,3	39	33,9	46	40	30	26,1	4,13 0,659
	3 people	121	25,7	42	35,9	41	35	34	29,1	
	4 people	167	35,5	52	32,3	67	41,6	42	26,1	
	5 or more	63	13,4	28	44,4	22	34,9	13	20,6	
Working field	National Education	161	34,3	56	36,4	54	35,1	44	28,6	12,76 0,238
	Religious	39	8,3	15	38,5	12	30,8	12	30,8	
	Safety	42	8,9	14	34,1	11	26,8	16	39	
	Health Department	39	8,3	11	28,2	19	48,7	9	23,1	
	Council	66	14	21	32,8	26	40,6	17	26,6	
	Other	123	26,2	44	37	54	45,4	21	17,6	
Tasks	Executive	57	12,1	18	32,1	22	39,3	16	28,6	9,66 0,646
	Trainer	145	30,9	54	39,1	47	34,1	37	26,8	
	Religious man	35	7,4	15	42,9	12	34,3	8	22,9	
	Security	40	8,5	13	33,3	12	30,8	14	35,9	
	Office Work	105	22,3	36	35	42	40,8	25	24,3	
	Technical works	44	9,4	14	33,3	21	50	7	16,7	
	Other	44	9,4	11	25,6	20	46,5	12	27,9	
Total	**(n=456)**			**161**	**35,3**	**176**	**38,6**	**119**	**26,1**	

*14 people do not use E-pulse.

right decisions about my health" in terms of finding e-health applications useful (37.3-47.6%), health literacy level it is significantly higher than those who are inadequate (15.1-19.7%) ($p<0.05$). In addition, the level of health literacy and the state of saying "it is an application that everyone should use" were found to be meaningless at the borderline ($p=0.055$).

14 people stated that they never used the E-Pulse application, 35.3% of them stated that they used the 1-3 menu, 38.6% of them stated that they used the 4-6 menu and 26.1% of them also used the 7-11 menu. Status of using E-Pulse menus; no significant difference was found according to gender, age groups, marital status, education level, how many people live in the house, the institution where they work, and the status of the job ($p>0.05$) (Table **2**).

The use of 7-11 of the E-Nabız application menus was found to be higher in those who have a chronic disease (38.3%), those who constantly use drugs (34.7%), those who obtain health-related information from reliable sources and those who use social media ($p<0.05$). Using E-Pulse menus according to HL level was not statistically significant ($p>0.05$).

Table 3: E-Pulse Usage by the way of Making Hospital Appointments and the Purpose of Using E-Health Applications

By the Way of Receiving the Hospital Appointment				E Pulse groups						
				1-3 items		4-6 items		7-11 items		X^2
		f	%	f	%	f	%	f	%	P
CPAS	No	132	28,1	59	47,6	51	41,1	14	11,3	21,86 0,000
	Yes	338	71,9	102	30,7	125	37,7	105	31,6	
From the hospital's own online appointment system	No	378	80,4	138	37,5	146	39,7	84	22,8	10,99 0,004
	Yes	92	19,6	23	26,1	30	34,1	35	39,8	
Via the e-Pulse application	No	324	68,9	134	43,2	116	37,4	60	19,4	34,41 0,000
	Yes	146	31,1	27	18,5	60	41,1	59	40,4	
Hi 182	No	277	58,9	95	35,3	100	37,2	74	27,5	0,84 0,655
	Yes	193	41,1	66	35,3	76	40,6	45	24,1	
I'm going to the hospital	Hayır	386	82,1	138	36,9	142	38	94	25,1	2,44 0,295
	Evet	84	17,9	23	28	34	41,5	25	30,5	
I take it to my close relatives	No	418	88,9	145	35	157	38,7	107	26,4	0,21 0,898
	Yes	52	11,1	19	38,0	19	38,0	12	24,0	
Purpose of Use of E-Health Applications										
nnspection appointment	No	107	22,8	56	57,7	31	32,0	10	10,3	30,72 0,000
	Yes	363	77,2	105	29,2	145	40,4	109	30,4	
View my health data	No	408	86,8	153	38,8	155	39,3	86	21,8	30,85 0,000
	Yes	62	13,2	8	12,9	21	33,9	33	53,2	
View my health history	No	191	40,6	102	57	61	34,1	16	8,9	74,01 0,000
	Yes	279	59,4	59	21,3	115	41,5	103	37,2	
To change my data	No	439	93,4	157	36,9	168	39,5	100	23,5	21,92 0,000
	Yes	31	6,6	4	12,9	8	25,8	19	61,3	
To follow up on my analysis and examination results	No	158	33,6	92	63	42	28,8	12	8,2	78,37 0,000
	Yes	312	66,4	69	22,3	134	43,2	107	34,5	
Covid risk situation	No	271	57,7	114	44,2	95	36,8	49	19,0	25,24 0,000
	Yes	199	42,3	47	23,7	81	40,9	70	35,4	
LFH code	No	271	57,7	114	43,7	104	39,8	43	16,5	34,01 0,000
	Yes	199	42,3	47	24,1	72	36,9	76	39,0	

LFH: Life Fits into Home, CPAS: Central Physician Appointment System.

Written sources in the E-Nabız group are reported to be 4-6 with the highest rate of 40.3% and 1-3 with the lowest rate of 26.9%. It has been reported that obtaining information from the website of official institutions of the E-Nabız group is 4-6 with the highest 34.7% rate and 1-3 with the lowest 31.8% rate. It has been reported that getting information from other internet pages in the E-Nabız group is 4-6 with the highest 36.5% rate, 1-3, and 7-11 with the lowest 31.7 rate.

Social media and application usage E-Pulse group have the highest number of Facebook 4-6 with 40.1%, Twitter 4-6 with 37.6%, Instagram 4-6 with 39.3%, and WhatsApp 4- with 40% It has been reported that there are 6, the lowest Facebook is 7-11 with a rate of 29%, Twitter with 1-3 with a rate of 28.5%, Instagram with 7-11 with a rate of 28.7%, and WhatsApp with a rate of 27.3% with 7-11.

In Table **3**, the comparison of E-Pulse Groups according to the way of making an appointment at the hospital and the purpose of using E-health applications is examined.

The rate of those who use E-Pulse 7-11 menus who get their hospital appointments from online systems is higher (31.6-40.4%) than those who use ALO 182 (24.1%) and their relatives (24.0%). According to the intended use of health applications, the rate of those who use 7-11 of the E-Pulse menus is the highest with 61.3% changing their data and viewing health data with 53.2% ($p<0.05$).

In addition, in terms of the purpose of using e-health applications of “4-6” and 7-11 individuals from e-pulse groups of individuals, examination appointments, viewing health data, adding data, changing information, following analysis and examination results, following covid risk status and the rate of LFH code inquiry cases (19-61.3%) is significantly higher than those in the e-pulse group with “1-3” (12.9-29.2%)

In line with the chi-square tests conducted within the scope of the research and the information obtained as a result, multinominal logistic regression analysis was performed with all of the independent variables that were found to have a significant relationship with E-Pulse and SSI, which are e-health applications, and which variables affected in which direction and severity

Table 4: Parameter Estimates of the Factors that may Affect the Number of E-Pulse Applications

E Pulse (Ref: 0-3 items)		B	Std. Error	P	O.R.	O.R. %95 confidence interval	
						Lower	Upper
4-6 items	Intercept	-2,284	0,443	0,000			
	Health workers	0,503	0,233	0,031	1,653	1,047	2,610
	Presence of chronic disease	0,197	0,331	0,552	1,218	0,636	2,331
	Frequency of application to health institutions	0,066	0,053	0,214	1,069	0,962	1,187
	Using Facebook	0,460	0,246	0,062	1,584	0,978	2,565
	Using Twitter	0,044	0,240	0,854	1,045	0,653	1,673
	Using e-Government	1,608	0,410	0,000	4,994	2,238	11,146
	Using e-mail	0,218	0,312	0,485	1,244	0,674	2,294
7-11 items	Intercept	-3,617	0,563	0,000			
	Health information resource = Health workers	0,494	0,263	0,061	1,638	0,978	2,745
	Presence of chronic disease	0,714	0,344	0,038	2,041	1,039	4,009
	Frequency of application to health institutions	0,139	0,061	0,023	1,149	1,020	1,296
	Using Facebook	0,559	0,290	0,054	1,749	0,992	3,085
	Using Twitter	0,613	0,272	0,061	1,846	1,084	3,143
	Using e-Government	1,058	0,497	**0,033**	2,882	1,087	7,640
	Using e-mail	0,973	0,417	**0,020**	2,645	1,169	5,984

Independent variables: Gender, Age, Marital status, Educational levels, Information source, Occupation, Position, Regular drug use, Facebook, e-mail, Banking, frequency of applying to a health institution, HL.

Table 5: Parameter Estimates of the Factors that may Affect the e-SSI Health-Related Menu Numbers

e-SSI (Ref: Not using)		B	Std. Error	P	O.R.	O.R. 95% Confidence Interval	
						Lower	Upper
1 menu	Intercept	0,743	0,438	0,089			
	Information source=Web page of official institutions	0,287	0,239	0,229	1,332	0,835	2,126
	Presence of chronic disease	-0,206	0,313	0,510	0,814	0,441	1,502
	Health personnel among relatives = None	-0,548	0,239	0,022	0,578	0,362	0,922
	Her job = Trainer	-0,384	0,250	0,124	0,681	0,418	1,111
	Her job = Technical work	0,114	0,374	0,760	1,121	0,539	2,332
	Using WhatsApp	-1,096	0,433	0,011	0,334	0,143	0,782
2 + menu	Intercept	0,133	0,493	0,787			
	Information source=Web page of official institutions	0,634	0,243	0,009	1,885	1,171	3,032
	Presence of chronic disease	0,501	0,289	0,083	1,651	0,937	2,908
	Health personnel among relatives = None	-0,271	0,242	0,261	0,762	0,475	1,224
	His/Her job = Trainer	-0,951	0,274	0,001	0,387	0,226	0,661
	His or Her job = Technical work	-0,896	0,465	0,054	0,408	0,164	1,015
	Using WhatsApp	-0,685	0,491	0,163	0,504	0,193	1,320

Independent variables: Gender, Age, Marital status, Educational levels, Information source, Occupation, Position, Regular drug use, Facebook, e-mail, Banking, frequency of applying to a health institution, HL.

and which ones were significant or not. Logistic regression analysis was performed to understand that it was meaningless. The results are given below.

Accordingly, it was determined that the independent variables affecting the use of 4-6 of the e-pulse menus were being a health information source and using e-government ($p<0.05$). Each of the detected variables affects the dependent variable positively (Table **4**).

The independent variables affecting the use of 7-11 of the e-pulse menus were determined as having a chronic disease, increasing the number of applications to health institutions, using Twitter, E-Government, and e-mail ($p<0.05$). Using Facebook ($p=0.054$) and reporting the health information source as a health worker ($p=0.061$) were found to be borderline insignificant (Table **5**). Accordingly, the variables affecting the group using a menu from the e-SSI groups were determined as the absence of health personnel among their relatives and not using WhatsApp ($p<0.05$).

It was determined that the variables affecting the group using 2 or more menus from the SSI groups were to specify the health-related information source as the web page of official institutions and not to work as an educator ($p<0.05$). In addition, not working in technical jobs ($p=0.054$) and the presence of chronic disease ($p=0.083$) were found to be borderline insignificant.

On using e-SSI menus, age, gender, education level, marital status, HL score, regular medication use, television as the source of health-related information, number of applications to health institutions, e-government, Instagram, Twitter, online banking, and e-mail use was not found to be statistically significant ($p>0.05$) (Table **5**).

4. DISCUSSION

When we look at the evaluation of the E-Health applications as beneficial among the participants in the research, it is reported that the highest rate is E-Pulse (86.6%) and Online CPAS (69.8%), while the lowest is the Hospitals' own online appointment information system (26%). In a study, it was stated that the rate of those who evaluated the E-Pulse system to be necessary and useful was 83.3% [8]. It has been observed that this rate is similar to the rate at which public personnel evaluates E-Pulse as useful.

When the usefulness of e-Health applications is examined in our study, it is reported that it facilitates the process of making an appointment (81.1%) and

benefiting from health services (70.2%) the most, and making it easier to make the right decisions about health (26.8%) the least. Considering the rate of evaluation of e-Health applications as easy to use, it is reported that E-Pulse (78.5%) and LFH (68.1%) applications are the highest.

The proportion of individuals who participated in the research with problematic and sufficient health literacy levels, said that "it makes it easier to benefit from health services" and "makes it easier for me to make the right decisions about my health" in terms of finding e-health applications useful, is significantly higher than those with insufficient health literacy level ($p< 0.05$) (Table **1**). In another study similar to the results of our study, it was stated that the e-Pulse application is useful, effortless and necessary, and it also facilitates the use of health services [9].

38.6% of the research group stated that they used 4-6 of the E-Nabız application menus and 26.1% used 7-11. The use of E-Pulse menus was not found to be significant according to socio-demographic characteristics (Table **2**). In a study, it was determined that there was no significant distinguishing feature in terms of socio-demographic variables such as age, class, and chronic diseases they had [10].

The use of 7-11 of the E-Nabız application menus was found to be higher in those who have a chronic disease (38.3%), those who constantly use drugs (34.7%), those who obtain health-related information from reliable sources and those who use social media (p). <0.05). In a study, it was determined that those who have a chronic disease (46.8%) and those who use drugs constantly (38.5) use the E-Pulse system at a higher rate [11]. In another study, it was determined that 66.7% of individuals follow health-related developments from social media and 51.7% from health personnel [12].

It was also determined that those who used E-Nabız to change their data and to view their health data used more menus ($p<0.05$) (Table **3**). In a study, it was seen that 13% of the participants in the study wanted to make changes in their blood pressure, pulse, blood sugar, and weight information from the adding information area, and 44% said that they wanted to view my health history [11]. Another study mentioned the importance of this.

With the e-Pulse Personal Health System, individuals can access their previous hospital visits, examinations, radiological images, and prescriptions, as well as register for organ donation, bone marrow, and blood donation; at the same time, it can track sleep data, vaccination schedules, number of steps, heart rate, blood pressure, sugar data with the application [13].

Using Facebook ($p=0.054$) and reporting the health information source as a health worker ($p=0.061$) were found to be borderline insignificant (Table **4**). Although the use of online social media such as Facebook and Twitter is considered borderline insignificant, it is thought that these applications have a slight influence on the use of 7-11 of the E-pulse menus, as these applications have become more effective today under the name of social media. It was determined that nearly half of the participants (46.8%) did not use any of the health-related menus of the E-Government SSI application, 27.9% used one and 25.3% used 2 or more menus.

In a study, 61.8% of the respondents answered that they agree with the statement “face-to-face meeting is my first choice in my affairs with the state” [8]. As it can be understood from this research in the literature, it has been determined that the individuals participating in the research primarily prefer to meet face-to-face in their business with the government.

In our study, it is thought that the reason why nearly half of the participants (46.8%) did not use any of the health-related menus of the e-government SSI application may be because the participants preferred face-to-face meetings in their dealings with the government. When those who have never used health-related SSI menus are taken as the reference group; The variables affecting the use of one of the SSI menus were found to be the absence of health personnel among their relatives and not using WhatsApp ($p<0.05$).

People who have health personnel among their relatives may not need e-Government-SSI transactions since they can access their health records through these people, on the contrary, people who are not relatives of health personnel may have to use SSI menus to access their health records. In another study, 34.8% of the respondents "agree", 11.8% were "undecided", and 53.5% "disagree" with the statement "I prefer to use the relevant e-service first in my work with the government"[8]. Similarly, in our study, the variables affecting the use of one of the SSI menus were determined as the absence of health personnel among their relatives and not using WhatsApp.

It was determined that the variables affecting the use of 2 or more of the SSI menus were specifying the health-related information source as the web page of official institutions and not working as an educator ($p<0.05$). People who obtain health-related information from official institutions' web pages may have used e-SSI menus more because they are more accustomed to online transactions. Again, the reason why public employees who do not work as educators use e-SSI menus more may be because they want to access SSI transactions more. In a study, the rate of those who believe that e-services are safe was 47.2%, and the rate of those who do not believe that they are safe was measured as 18.8% [8].

Likewise, in our study, it is thought that the reason why people who obtain health-related information from official institutions' web site use e-SSI menus more and public employees who do not work as educators use e-SSI menus more because e-services are reliable.

In addition, not working in technical jobs ($p=0.054$) and the presence of chronic disease ($p=0.083$) was found to be borderline insignificant (Table **5**). There is no study in the literature about using SSI menus in e-Government. For this reason, the use of SSI menus could not be discussed based on the literature. No significant relationship was found between gender, age, marital status, educational status, occupation, regular drug use, Facebook, e-mail, banking, frequency of applying to a health institution, HL level, and using e-SSI menus, which were included in the multiple analysis. Although there is no significant relationship between Facebook, e-mail, banking, and HL level and using e-SSI menus, which were analyzed multiple times, it is necessary for those who use Facebook, e-mail, and banking applications to have SSI transactions so that internet access is not a restrictive reason for accessing the system. It is thought that the e-SSI is apt to use the menus in the e-SSI application, albeit slightly.

5. CONCLUSION AND RECOMMENDATIONS

It was observed that the health literacy level of 21.5% of public employees was insufficient, 41.3% problematic and 37.2% sufficient.

The effect of health literacy level on the level of using LFH, E-Pulse, and E-Government SSI applications was not found statistically significant.

It was seen that the most used E-health application was E-pulse with 84.9%, LFH, and CPAS with 64.3%, and the lowest was the online systems of the hospitals with 29.1%.

35.3% of the E-Pulse application use the 1-3 menu, 38.6% use the 4-6, and 26.1% the use 7-11 menu.

The rate of those who do not use any of the health-related menus of the e-Government SSI application is 46.8%, the rate of those who use only one is 27.9%, and the rate of those who use 2 or more is 25.3%.

Training programs can be planned for the services offered by E-Pulse, HEPP, and CPAS systems and how individuals can benefit from these services efficiently. Again, to raise awareness of these practices, public service announcements can be increased with the help of channels such as magazines and television.

REPRESENTATIONS

This study was prepared by using the data from the master's thesis named "The effect of health literacy level on the use of e-health applications".

ETHICAL APPROVAL

Public employees were informed about the research and their consent was obtained. Before starting the survey, those who approved to participate in the survey online were allowed to complete the survey. The research was conducted by the rules and ethical codes specified in the Declaration of Helsinki.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this study.

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AUTHORSHIP CONTRIBUTIONS

DO and MK. Planning, implementation, statistical analysis of the research, writing, and reviewing the article.

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