

ARAŞTIRMA / RESEARCH

Effect of e-Health Literacy on the Fear of COVID-19 and Attitudes Towards Protection: A Cross-Sectional Study

e-Sağlık Okuryazarlığının COVID-19 Korkusu ve Korunmaya Yönelik Tutumlara Etkisi: Kesitsel Araştırma

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Abstract

Objective: The aim of this study was to evaluate the predictive effect of the e-Health literacy level of individuals on attitudes towards protection from COVID-19 and the level of fear during the COVID-19 pandemic.

Material and Method: The population of this cross-sectional study included individuals who could be reached through social media channels (Facebook, Instagram, WhatsApp) and e-mail between July and October 2020, and the sample of the study consisted of 522 literate individuals who had internet access and agreed to participate in the study. Data were collected using the personal identification form, the e-Health Literacy Scale (eHEALS), and the Fear of COVID-19 Scale (FCV-19S). Statistical analyses were performed using Mann-Whitney U test, Kruskal-Wallis test, Posthoc analysis, Binary Logistic Regression analysis, and Simple Regression Analysis.

Results: 53.4% of the participants are women, 89.5% are university graduates, 60.3% are working in a job. The e-health literacy scores of those who follow the current information to prevent COVID-19 infection, wash their hands, use disinfectants, and stay 2 meters away from people compared to others, and those who act in accordance with the recommendations of the experts, were statistically significantly higher than those who behaved in line with the bans. Presence of chronic disease among family members, young age and high level of health literacy are predictive factors of COVID-19 fear.

Conclusion: The results of this study have shown that the level of fear of COVID-19 increases as the e-Health literacy level increases. As the e-Health literacy score of individuals increases, the rate of apply the preventive measures against COVID-19 also increases.

Keywords: COVID-19, e-Health Literacy, fear, protective behaviour, nursing.

Öz

Amaç: Bu araştırma, COVID-19 pandemi döneminde bireylerin e-Sağlık okuryazarlığı düzeyinin COVID-19'dan korunmaya yönelik tutumlara ve korku düzeyine yordayıcı etkisini değerlendirmek amacıyla yapıldı.

Gereç ve Yöntem: Kesitsel tipteki bu araştırmanın evrenini Temmuz-Ekim 2020 tarihleri arasında sosyal medya kanalları (Facebook, Instagram, WhatsApp) ve e-posta aracılığı ile ulaşılabilen bireyler; örneklemini belirtilen evren içerisinde okuma-yazma bilen, internet erişimi olan ve araştırmaya katılmayı kabul eden 522 birey oluşturdu. Veriler birey tanıtım formu, e-Sağlık Okuryazarlığı Ölçeği ve COVID-19 Korku Ölçeği kullanılarak toplandı. Veriler sayı, yüzde, ortalama ve standart sapma ile verildi. İstatistiksel analizde Mann Whitney U testi, Kruskal Wallis testi, Posthoc analizi, Binary lojistik regresyon analizi ve Basit Regresyon analizi uygulandı.

Bulgular: Katılımcıların %53,4'ü kadın, %89,5'i üniversite mezunu, %60,3'ü bir işte çalışmaktadır. COVID-19 enfeksiyonunu önlemeye yönelik güncel bilgileri takip edenlerin, ellerini yıkayanların, dezenfektan kullananların, insanlara 2 metre mesafede duranların diğerlerine göre, uzmanların önerisine uygun şekilde davrananların yasaklar doğrultusunda davranış sergileyenlere göre e-sağlık okuryazarlığı puanları istatistiksel düzeyde anlamlı yüksekti ($p<0,005$). Aile üyeleri arasında kronik hastalık varlığı, genç yaş ve sağlık okuryazarlığının yüksek olması COVID-19 korkusunun yordayıcı faktörleridir.

Sonuç: Araştırmada e-Sağlık okuryazarlığı düzeyi arttıkça COVID-19 korku düzeyi artmakta, COVID-19'dan korunmaya yönelik güncel bilgileri takip etme, siperlik kullanma, el dezenfektanı kullanma, el hijyenini sağlama artmaktadır.

Anahtar Kelimeler: COVID-19, e-Sağlık okuryazarlığı, korku, önleyici davranışlar, hemşirelik.

1. Introduction

The 2019 novel coronavirus (2019-nCoV), which is the causative agent of this viral infection, is transmitted from person to person through infected droplets, unventilated environment with viral aerosols, and face-touching after touching a contaminated surface (1, 2). The most effective way to prevent diseases transmitted by direct cough, sneezing, and indirect droplets is to avoid exposure to the virus. For this, use of mask, good ventilation of rooms, hand hygiene, physical distance, and avoidance of crowds are recommended effective methods (3, 4).

COVID-19 – a global crisis – is increased the anxiety, fear, and stress levels of individuals. Given the expected course of the virus, and the timeline for its spread, fears about the future are increasing gradually (5). Centers for Disease Control and Prevention stated that in order to cope with stress and anxiety, it is necessary to avoid excessive exposure to media publications about COVID-19, as well as recommendations such as nutrition, sleep and exercise, and that reading articles on the subject should be suspended for a while. In our country, the Turkish Psychiatric Association has informed the public by translating this article into Turkish and continues to inform (6).

Particularly the information pollution in communication networks, such as social media, television and newspapers, increases the level of stress and fear (7). In an increasingly media-saturated world, individuals need to have the necessary skills regarding access to health-related information resources such as television, internet, and mobile apps and the use of information obtained from such information sources (8). Other studies stated that stress, anxiety and depressive mood are prominent in people with high pandemic-related media exposure (9, 10). In addition to this information, social networking platforms contribute to the implementation of protective measures by ensuring that messages reach the target groups via public health institutions and it can be used as an important method to increase the understanding of public health (11).

Developments in the digital environment in recent years have brought the concept of e-Health literacy into the agenda within the concept of health literacy. e-Health literacy is described as the ability to search, find, understand and evaluate health information from electronic sources and to apply the information obtained to deal with or solve a health problem (12). Studies in the relevant literature have reported that societies with high health literacy use health services effectively and efficiently, facilitating the diagnosis and treatment processes (13). It is reported that high e-health literacy has positive effects especially on mood during the COVID-19 pandemic. eHealth literacy also cause lower depressive mood, fear and anxiety (5, 14, 15). In the literature, no research has been found on the relationship between e-health literacy, COVID-19 fear level and protective behaviors during the pandemic in Turkey. Based on this information, this study aimed to investigate the effect of individuals' level of e-Health literacy on their attitudes towards disease prevention and level of fear during the COVID-19 pandemic. The hypotheses of the research;

H0: e-Health literacy level does not affect fear of Covid-19 and prevention measures from Covid-19.

H1: As e-Health literacy level increases, Covid-19 fear level decreases.

H2: As the level of e-Health literacy increases, the rate of implementation of prevention measures from Covid-19 increases.

2. Material and Method

2.1. Study design and participants

This cross-sectional research aimed to evaluate the predictive effect of the e-Health literacy level of individuals on the level of fear during the COVID-19 pandemic and attitudes towards protection from COVID-19. After the first coronavirus patient in Turkey was detected on March 11, 2020, the survey application was carried out through social media networks, since face-to-face surveys could not be conducted due to the measures taken by our government to protect public health. The population of the research is individuals who can be reached through social media channels (Facebook, Instagram, WhatsApp) and e-mail between July and October 2020. The sample consisted of those who could read and write in Turkish and agreed to participate the research. The research was completed with 522 people after removing the individuals who did not complete the internet-based questionnaire.

Participants were recruited using the snowball sampling method. First of all, the Personal Information Form, the COVID-19 Fear Scale and the e-Health Literacy Scale were converted into a web-based questionnaire with the link created in Google Form by the researchers. The link created on Google Form was conveyed to the participants online (e-mail, Facebook, Instagram, WhatsApp). Participants were asked to fill in the relevant form and scale by connecting to the website with a computer or smartphone (16, 17). The researchers connected with people registered in e-mail, WhatsApp, Facebook and Instagram accounts by sharing the invitation letter containing information about the purpose, method and participation of the research. Then, with the help of the social media and e-mail accounts of the contacted people, someone else was contacted and then another person was contacted in the same way. Thus, the sample grew sequentially as a snowball effect. Thus, the sample grew sequentially as a snowball effect. In order to test the item-total correlation in scale studies in determining the sample size, it is recommended that the sample size should be 5-10 times the number of items (18). For this reason, the number of samples for data collection forms consisting of 40 items in our study was planned to be at least $40 \times 10 = 400$.

2.2. Collection of study data

The research data were collected using the personal identification form, e-Health Literacy Scale (eHEALS), and the Fear of COVID-19 Scale (FCV-19S).

The Personal Information Form: This form was developed by the researchers and included a total of 19 questions about sociodemographic and medical characteristics, attitudes towards protection from COVID-19, and internet use (14, 19, 20).

FCV-19S: This scale, developed by Ahorsu et al. (2020), was adapted into Turkish by Bakioglu (2020). It is a four-point Likert-type scale consisting of seven items. The total score obtained from all items reflects the level of fear of COVID-19 experienced by the individual. The scores that can be obtained from the scale range from 7 to 35. The higher the score, the greater the fear of COVID-19. It was determined that the corrected item-total correlations of the scale items ranged between 0.62 and 0.72, and the Cronbach's alpha internal consistency coefficient was 0.88 (21).

eHEALS: The eHEALS was developed by Norman and Skinner (2006). It was translated into Turkish by Tamer Gencer (2017) after they conducted a validity and reliability study. It is a five-point Likert type scale consisting of eight items. The minimum and maximum possible scores that can be obtained from the scale are 8 and 40 points, respectively. Higher scores indicate higher e-Health literacy level. The internal consistency coefficient of the scale was 0.863 and the test-retest reliability was 0.886. The scale is highly reliable with a Cronbach's alpha coefficient of 0.915 (22).

2.3. Statistical analysis

Descriptive data were expressed as number, percentage, mean and standard deviation in the evaluation of the research data. Shapiro-Wilk test was used to determine whether the variables followed a normal distribution. Mann Whitney U test was applied to compare scores of non-normally distributed COVID-19 fear scale and e-health literacy scale between two groups according to prevention measures from COVID-19 infection and some variables. Kruskal Wallis test was applied to compare between groups of three or more. Multipl Regression Analysis was performed to determine the predictive factors, on the fear of COVID-19.

2.4. Ethical considerations

Before the research, Ministry permission required for COVID-19 scientific studies in Turkey for the research was obtained from Republic of Turkey Ministry of Health (2020-07-04T10-57-35); ethics committee permission was obtained from Gümüşhane University Scientific Research and Publication Ethics Committee (dated 08/07/2020 and approval number 2020/7).

All potential participants who were willing to participate in the study were informed about the research in the first part of the web-based questionnaire and they were deemed to provide consent to participate in the study if they completed the web-based questionnaire.

3. Results

The mean age of the participants was 31.68 ± 9.91 years and 89.5% were university graduates. Of the participants, 74.1% stated that they were using the internet frequently in their daily lives and 56.3% stated that they were using the internet for access to social media (Table 1).

Table 1. Distribution of Socio-demographic Characteristics of the Participants (n=522)

Variables	mean±SD	min-max
Age(year)	31.68±9.91	18-69
Gender	n	%
Female	279	53.4
Male	243	46.6

Table 1(continue). Distribution of Socio-demographic Characteristics of the Participants (n=522)

Education level		
Literate	2	0.4
Primary school	6	1.1
Secondary school	4	0.8
High school	43	8.2
University	467	89.5
Marital status		
Married	247	47.3
Single	261	50
Divorced	14	2.7
Income status		
Income less than expenses	126	24.1
Income equal to expenses	281	53.8
Income more than expenses	92	17.6
Employment status		
Yes	315	60.3
No	207	39.7
Health insurance status		
Yes	460	88.1
No	62	11.9
Individuals living with		
Alone	60	11.5
Family	453	86.8
Others	9	1.7
Spending a lot of time on the internet in daily life		
Yes	387	74.1
No	135	25.9
The reason for using internet in daily life		
Access to social media	294	56.3
Reading articles	63	12.1
Watching movies-series	51	9.8
Listening radio-music	37	7.1
Other*	28	5.4
Reading journal	22	4.2
Playing online games	16	3.1
Total	522	100

* Online shopping, following finance-stock market, watching video-youtube

The mean FCV-19S and eHEALS scores were found to be 17.85 ± 6.14 and 28.78 ± 7.82 , respectively. While 61.9% of the participants stated that the internet was useful when making health-related decisions, 55.7% stated that the internet was important in accessing health resources (Table 2).

The model established with the mean of e-Health literacy score and age, marital status, educational status, income status, employment status, health insurance status, chronic disease status of participants and COVID-19 Fear Scale score of participants were found to be significant ($F = 5.980, p < 0.001$). When the beta coefficient value, t value and significance level of the dependent variable are examined, it was observed that if the eHEALS average score increased by one unit, the COVID-19 Fear scale average score increased by 0.174 units.

When age decreased by one unit, COVID-19 Fear scale average score increased by 0.072 units ($p=0.028$). In the presence of chronic disease among family members, the Fear of COVID-19 scale average score increased by 1.765 unit ($p=0.001$). It was determined that the level of e-Health literacy, age and status of chronic disease among family members predicted the Covid-19 Fear level ($\beta = 0.173$, $p < 0.001$; $\beta = -0.072$, $p=0.028$; $\beta = -1.765$, $p=0.001$) (Table 3).

Table 2. Distribution of Health-related Characteristics of Participants

Variables	mean±SD	Min-max
Score of FCV-19S	17.85±6.14	7-35
Score of eHEALS	28.78±7.82	8-40
Considering whether the internet is useful when making decisions about health		
Not at all useful	38	7.3
Not useful	44	8.4
Neutral	65	12.5
Useful	323	61.9
Very useful	52	10
Report whether it is important to have access to health resources on the internet		
Not at all important	17	3.3
Not important	37	7.1
No idea	40	7.7
Important	291	55.7
Very Important	137	26.2
Status of chronic disease		
Yes	98	18.8
No	424	81.2
Status of chronic disease among family members		
Yes	296	56.7
No	226	43.3
Following up to date information on Covid-19 infection		
Yes	493	94.4
No	29	5.6
Washing hands with soap and water for at least 20 seconds		
Yes	377	72.2
No	17	3.3
Washing hands without paying attention to time	128	24.5
Use of sanitizer		
Yes	445	85.2
No	77	14.8
Wear of surgical mask		
Yes	512	98.1
No	10	1.9
Wear of face shield		
Yes	47	9
No	475	91
Keep of social distance at least 2 meters		
Yes	378	72.4
No	144	27.6

Table 2 (Continue). Distribution of Health-related Characteristics of Participants

Practice of prevention methods against Covid-19 infection		
In accordance with the recommendation of experts	413	79.1
As it comes to mind, random	72	18.8
In accordance with prohibitions	33	6.3
Due to community pressure	4	0.8
Other*	10	1.9
Total	522	100

*As you go out into the community, less than experts suggest

Table 3. Distribution of Participants' eHEALS Score by Score of FCV-19S and Attitudes towards Protection from COVID-19 Infection

Variables	β	t	p	R ²	F	p (Model)	
Score of FCV-19S	0.174	5.173	<0.001	0.047	26.762	<0.001*	
Attitudes against Covid-19	β	S.E.	Wald	df	p [†]	Exp(β)	%95CI
Following up-to-dates	-0.111	0.021	27.929	1	<0.001	0.895	0.859-0.933
Washing hands	-0.111	0.026	17.561	1	<0.001	0.895	0.850-0.943
Use of sanitizer	-0.034	0.015	5.322	1	0.021	0.967	0.939-0.995
Wear of face shield	-0.016	0.021	0.586	1	0.444	0.984	0.984-1.025

*Simple regression analysis; †Binary logistic regression analysis

In this study, Binary Logistic Regression analysis was used to determine whether the eHEALS score influenced the attitudes towards protection from COVID-19. Attitudes towards protection from COVID-19 were included in the model as the dependent variable whereas the eHEALS score as the independent variable. The values determined in the Binary Logistic Regression Analysis explains that the effect of eHEALS score on following up to date information about Covid-19 infection is between 0.52% and 14%; the effect on wearing a surgical mask is between 0.17-0.98%, the effect on wearing a face shield is between 0.01-0.03%, the effect on standing at a distance of at least 2 meters to other people is between 0.29-0.42%, the effect on disinfectant use is between 0.10-0.17%, the effect on washing hands for at least 20 seconds between 0.33-13%. As the eHEALS score decreases, the risk of not following up-to-date information increases 0.895 times ($p < 0.001$), the risk of not washing hands increases 0.895 times ($p < 0.001$), the risk of not using disinfectant increases 0.967 times ($p = 0.021$) (Table 4).

Table 4. Distribution of Participants' eHEALS Score by Attitudes towards Protection from COVID-19 Infection

Variables	β	S.E.	Wald	df	p [†]	Exp(β)	%95CI for Exp(β)
Following up-to-dates	-0.111	0.021	27.929	1	<0.001	0.895	0.859-0.933
Washing hands	-0.111	0.026	17.561	1	<0.001	0.895	0.850-0.943
Use of sanitizer	-0.034	0.015	5.322	1	0.021	0.967	0.939-0.995
Wear of face shield	-0.016	0.021	0.586	1	0.444	0.984	0.984-1.025

†Binary logistic regression analysis

4. Discussion

Health communication aimed at informing people about COVID-19 has ensured and continues to ensure that information on protective measures or how to prevent its spread has been shared by healthcare professionals using mass media and digital media. The health literacy level of individuals comes to the fore with regard to the ability to reach the most accurate information on the subject and to understand and use this information. In the literature, individuals with a sufficient level of health literacy have been reported to be able to read and interpret health-related information correctly, use health services effectively and efficiently, and make effective use of health information technologies (13, 23, 24).

In the present study mostly involving university graduates, more than half of the participants stated that the internet was useful when making decisions about health during the COVID-19 pandemic and the mean eHEALS score was found to be 28.78 ± 7.82 over 40 points. It was thought that the reason for this situation might have come from the university graduates (89.5%) and the young age group (31.68 ± 9.91) of the sample, and these results were similar to the Turkish Health literacy results. In addition, in our study, it was thought that the high number of people (61.9%) who reported that the internet is important in making decisions about health during the pandemic may be a result of e-health literacy, as well as the fact that the information-seeking behavior of the young, educated group is mostly carried out on the internet. Similarly, in a study conducted with 6228 households in our country, it was determined that the internet was used the most (48.6%) as a communication tool, and the level of health literacy was found to be higher in those who use a communication tool compared to those who do not (25).

In a study conducted in Bangladesh involving a group of university students who were used social media by internet and shared any health information in the past 12 months, 74% of individuals stated that they used web services to access health information and the internet was useful for making decisions about their health (26). Khademian et al. (2020) stated that university students who spend an average of 1-2 hours a day on the computer have an average e-health literacy score of 19.11 out of 28 points, and they seek health information on the computer for themselves 82.1%, their families 75.6%, their friends and colleagues 30.3% (27). Studies show that university students with a high level of e-Health literacy participate more in health promoting activities (28) and have higher rates of benefiting from health services (29). It is seen that the findings of our study are similar with the literature (25, 27, 28) and individuals with a high level of education reported that the internet is beneficial in accessing information resources about health and health services.

According to our results, we determined that the COVID-19 fear score is about average level and did not support our hypothesis. Being at a young age, presence of chronic diseases among family members and high level of health literacy in our study increase the fear of COVID-19. It may be expected that the presence of chronic illness among family members triggers the fear of COVID-19. Because it is known in the literature that individuals with chronic diseases have a more severe COVID-19 clinical presentation

and mortality rates increase (30). It is also understandable that young individuals, who have a longer life expectancy and have many plans they want to realize, are afraid of the COVID-19 disease, which has serious conditions such as the risk of death. However, as the level of e-Health literacy increases, the fear of COVID-19 is not expected to increase. Because individuals with high e-Health literacy are skilled in searching, finding and understanding health information from electronic sources and solving a health problem with the information obtained (5,12). In this case, the e-Health literacy of the participants may be high within the scope of the research. However it raises a question: Could these participants, who spend most of their time on social media while using the internet, have increased their level of fear via being influenced by the correct and incorrect information on the social media?

During the pandemic period, although health authorities and experts on the subject at international and national level inform the public through using social media channels such as Twitter, Facebook, Instagram, YouTube as well as traditional media such as television, newspaper and radio, the information provided can be misinterpreted by individuals and rumours may emerge (31-34). Misinformation and rumors about the subject can spread very quickly, especially through social media, leading to dangerous thoughts, feelings and behaviors such as fear, sadness, suicide, and wrong practices (35, 36).

There are studies reporting that social media is an important source of information to learn about epidemics (32, 33). However Rai et al. (2020) have reported that the rapid change in false health information and rumors circulated on social media leads to information pollution and that people can get lost in wrong and irrelevant health information within this information pollution (34). In some studies stated that there is exposure to false information (33-36). In a study by Exposure to misinformation is higher in people with younger age, higher education level and low income and sources of false information stem from social media networks and instant messaging. In a systematic review in which 42 studies are examined, it was reported that there are mainly 5 important determinants which are in the first place such as information sources of infodemic, structure and consensus of online communities, communication tools, content of messages given (37). Therefore, while informing about the pandemic, as well as focusing on the way the information is given, its content and the structure of the society, proven information and whether public displays the correct behaviour based on the information they acquire is also needed to be focused on (37, 38).

In our research, no observations were made about whether to fulfill the methods of protection from Covid-19, but the answers given about the methods of protection are completely limited to the participants' "yes" or "no" statements. According to the responses received from the participants, when the eHEALS score decreases by one unit, the risk of not following the current information increases 0.895 times, the risk of not washing hands increases 0.895 times, and the risk of not using disinfectants increases 0.967 times. In the study, it was determined that the increase in eHEALS score positively increased hand washing and disinfectant use, but the effect of e-Health literacy on these situations was low.

These results supported our H2 hypothesis. In a study, health workers with high e-Health literacy levels were found to have higher compliance with infection prevention and control procedures, to demonstrate more healthy lifestyle behaviors, and to show less COVID-19 symptoms (39). In a study conducted in China, it was stated that both the disease knowledge and e-Health literacy of the participants contributed positively to preventive behaviors during the COVID-19 pandemic, and the benefits of social media in pandemic control for countries were emphasized (40).

5. Conclusions

University graduates included in the present study reported that the use of online information resources is beneficial in accessing health information. Presence of chronic disease among family members, young age and high level of health literacy are predictive factors of COVID-19 fear. As the e-Health literacy score of individuals increases, the rate of following up-to-date information, using face shields and hand sanitizer's and ensuring hand hygiene also increases. COVID-19 fear level is high among those who spend most of their time on the internet in daily life. According to these results, considering that young adults in our country spend a significant part of their time on social media, it is recommended that health authorities use social media more for the public requiring access both the COVID-19 pandemic health resources and the right-reliable health resources.

6. Contribution to the Field

In order to protect and promote health during the COVID-19 pandemic accurate, reliable information sources should be created and accessed by experts on the online platform. Otherwise, in addition to practices that threaten physical health, situations threatening the mental well-being such as fear, anxiety, sadness and the inability to benefit from health services effectively may occur. Nurses, producing and providing reliable information resources should be effective with helping people read, understand and interpret the level of health literacy about COVID-19 infection. Besides nurses who are aware of the importance of e-Health literacy should prepare educational materials and programs by means of considering the health literacy level of the society they work in and manage the care process.

Limitations of Research

The results of study has revealed that this study had several limitations. First, data were collected by applying an online survey and only the data of individuals, who could be reached via social media. The knowledge, attitudes and fear levels of individuals who were not use social media were not investigated. Second, the majority of sample were university graduates, young adults, and individuals with a good income. For this reasons, future researches should be planned by considering all age groups, education levels, income levels, and those who use digital media and do not use digital media for obtaining health information.

Conflict of Interest

We noted as authors to you that manuscript has no all possible conflicts of interest, including financial, consultant, institutional and other relationships. There was no support sources while these research was made.

Author Contributions

All authors have contributed significantly, and all authors are in agreement with the content of the manuscript: **Conception/Design:** AÖ and AK; **Collection of Data:** AÖ and AK; **Assembly of Data:** AÖ and AK; **Data Analysis and Interpretation:** AÖ; **Manuscript Writing:** AK and AÖ; **Final Approval of Manuscript:** AÖ.

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