Türkiye Klinikleri Hemşirelik Bilimleri Dergisi
Turkiye Klinikleri Journal of Nursing Sciences
Turkiye Klinikleri J Nurs Sci. 2023;15(3):625-34

ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

DOI: 10.5336/nurses.2022-94484

Correlation Between the Health Literacy of Individuals in Türkiye and Their Level of Knowledge About COVID-19 and Their Status of Taking Protective Measures: Descriptive and Relationship Seeking Study

Türkiye'de Bireylerin Sağlık Okuryazarlıkları ile COVID-19'a İlişkin Bilgi Düzeyleri ve Koruyucu Önlemler Alma Durumları Arasındaki İlişkisi: Tanımlayıcı ve İlişki Arayıcı Çalışma

Emine ŞENYUVA[a], Deniz YILDIRIM[b]

[a]Department of Nursing Education, İstanbul University-Cerrahpaşa Florence Nightingale Faculty of Nursing, İstanbul, Türkiye
[b]Prof. Dr. Cemil Taşcıoğlu City Hospital, İstanbul, Türkiye

ABSTRACT Objective: This study aims to determine the correlation between the health literacy of individuals in Türkiye and their level of knowledge on coronavirus disease-2019 (COVID-19) and to what extent they take protective measures. **Material and Methods:** The study was conducted in accordance with the descriptive study method. The study was conducted with 511 people aged between 18-65, living in İstanbul. Study data were collected using the Information Form, Turkey's Health Literacy Scale-32. **Results:** In the study, it has been found that 46.4% of the individuals have inadequate health literacy. An strong positive correlation was found between the health literacy of individuals and their status of knowledge of COVID-19 and the protective measures they took regarding COVID-19. **Conclusion:** As the health literacy of individuals increases,the protective measures taken against COVID-19 increase,as well.Although the COVID-19 pandemic has reduced its impact today,it still continues to be a respiratory disease with a high risk of death all over the world.The high level of health literacy of the individual/society enables individuals to have knowledge about COVID-19,to distinguish between true and false knowledge, to protect themselves from COVID-19,and to take the necessary protective measures (physical/social distance,wearing masks,hand washing,isolation/staying at home, etc.) to minimize the risk of contagion related to COVID-19.As a result of this study, it is recommended to increase the health literacy of the society.Thus, preventive measures against COVID-19 can be provided and the COVID-19 outbreak can be brought under control all over the world.

Keywords: Health literacy; COVID-19; pandemics; health education

ÖZET Amaç: Bu çalışma, Türkiye'deki bireylerin sağlık okuryazarlığı ile koronavirüs hastalığı-2019 [coronavirus disease-2019 (COVID-19)] hakkındaki bilgi düzeyleri arasındaki ilişkiyi ve koruyucu önlemleri ne ölçüde aldıklarını belirlemeyi amaçlamaktadır. **Gereç ve Yöntemler:** Bu çalışma tanımlayıcı, kesitsel ve ilişki arayıcı araştırma yöntemine uygun olarak yapılmıştır. Araştırma, İstanbul'da yaşayan 18-65 yaş arası 511 kişi ile gerçekleştirilmiştir. Araştırma verileri Türkiye Sağlık Okuryazarlığı Ölçeği-32 ve Bilgi Formu kullanılarak toplanmıştır. **Bulgular:** Araştırmada bireylerin %46,4'ünün sağlık okuryazarlığının yetersiz olduğu saptanmıştır. Bireylerin %56,5'inin COVID-19 hakkında sahip olduğu bilgiyi yeterli bulduğunu, %88,5'inin COVID-19'a ilişkin koruyucu önlemler aldığını ifade ettiği belirlenmiştir. Bireylerin sağlık okuryazarlığı ile COVID-19 hakkında bilgi sahibi olma durumu ve COVID-19'a karşı aldıkları koruyucu önlemler arasında ileri düzeyde pozitif bir ilişki bulunmuştur. **Sonuç:** Bireylerin sağlık okuryazarlığı arttıkça COVID-19'a karşı alınan koruyucu önlemler de artmaktadır. COVID-19 salgını günümüzde etkisini azaltmış olsa da halen tüm dünyada ölüm riski yüksek bir solunum yolu hastalığı olmaya devam ediyor. Bireyin ve toplumun sağlık okuryazarlığının yüksek olması, bireylerin COVID-19 hakkında bilgi sahibi olmalarını, doğru ve yanlış bilgiyi ayırt edebilmelerini, COVID-19'dan korunmalarını, COVID-19'a ilişkin bulaşıcılık riskini en aza indirecek gerekli koruyucu önlemleri (fiziksel/sosyal mesafe, maske takma, el yıkama, izolasyon/evde kalma vb.) alabilmelerini sağlamaktadır. Bu çalışma sonucunda birey/toplumun sağlık okuryazarlığının arttırılması önerilmektedir. Böylece COVID-19'a karşı önleyici tedbirler alınabilir ve tüm dünyada COVID-19 salgını kontrol altına alınabilir.

Anahtar Kelimeler: Sağlık okuryazarlığı; COVID-19; pandemik; sağlık eğitimi

Correspondence: Deniz YILDIRIM
Prof. Dr. Cemil Taşcıoğlu City Hospital, İstanbul, Türkiye
E-mail: denizyildirim.3453@gmail.com

Peer review under responsibility of Turkiye Klinikleri Journal of Nursing Sciences.

Received: 22 Nov 2022 ***Received in revised form:*** 18 May 2023 ***Accepted:*** 01 Jun 2023 ***Available online:*** 06 Jun 2023

The world was introduced to a novel, pneumonia like virus, determined in Wuhan, China on December 2019. This new virus named coronavirus disease-2019 (COVID-19) caused a never-before-seen health crisis in the whole world and this process saw a great number of valid and invalid information related to COVID-19 rapidly increase and spread via the internet, social media, or other communication technologies.[1-6] All these valid/invalid information and practices have caused difficulties with respect to which information individuals should take, how to apply, use and reflect on their behavior the information they have received. High health literacy of individuals is critical in terms of eliminating such difficulties.[2,3,5,7] Health literacy is "individuals" knowledge, skill, desire and ability to obtain, understand, evaluate, and apply/use healthcare information in order to increase or maintain the quality of life, make appropriate health decisions and achieve results in accordance with these decisions."[8]

Individuals with high health literacy are capable of differentiating between right and wrong information related to COVID-19, are able to make conscious decisions in relation to COVID-19, have knowledge of and are able to apply health protective measures. In other words, they are aware of the gravity of the situation, know how to protect both themselves and others by taking simple measures, and implement these measures.[1,2,4,9-11] Literature states that health literacy is low in many countries, and emphasizes that the low level of health literacy causes problems with respect to individuals' adaptation to treatment and chronic disease management, proper expression of information concerning their state of health, understanding the education materials provided, the inability to differentiate between right and wrong information, increased visits to the hospital, longer hospitalization periods, and increased healthcare service costs.[12-14]

As it is understood from the literature, it is understood that the concept of health literacy does not only have a personal meaning for each individual, but also beneficial in terms of health, economy and society. Today, patients have a significant responsibility in managing their own healthcare needs and are expected to navigate a complex healthcare system. Health literacy is more than just a concept of reading, writing and speaking, it is a necessary skill for seeking health information. The level of health knowledge regarding COVID-19 depends not only on the patient's knowledge and abilities, but also on the ability of health professionals to disclose adequate information in a form that is understandable and acceptable to the patient. It is important for nurses to provide health education to the individual/society in order to ensure the individual's self-efficacy in seeking and understanding information about COVID-19 and transforming it into their behaviors.[15-17] Health literacy has become a global society health goal, particularly during the pandemic, to support health promotion and improve health outcomes for COVID-19 patients with limited health literacy through improved education and communication strategies. In addition, International Council of Nurses (ICN) (2021) emphasizes the responsibility of nurses in health education for society health. In line with this information, it can be understood that the subject of health literacy should be included in nursing education and that it is a part of patient education.[14,18]

The Turkish Health Ministry (2018) conducted a comprehensive study targeting all age groups before the start of the COVID-19 pandemic in Türkiye, and determined that 38.0% of individuals have problematic-limited health literacy. Wolf et al. determined that one-third of the patients during the COVID-19 pandemic did not know about the symptoms associated with COVID-19 and health literacy was low in this regard19.[19] Okan et al., on the other hand, determined that although many participants had high health literacy, they had difficulty distinguishing whether the information about COVID-19 was true or false.[9] When all these research results are examined, it is understood that there is an important relationship between the management of COVID-19 and the health literacy of individuals.

This study is expected to close an important gap in the literature, since there is no comprehensive study determining the health literacy level of the society in the first period of the COVID-19 pandemic process in our country, and nurses cannot determine the relationship between COVID-19 knowledge levels, protective measures and health literacy levels of COVID-19 patients.

This study aims to determine the correlation between the health literacy of individuals in Türkiye and their level of knowledge on COVID-19 and to what extent they take protective measures.

MATERIAL AND METHODS

STUDY DESIGN

Since the research covers a certain period in the COVID-19 pandemic process, it is a cross-sectional study, on the other hand, it is a correlational research as it aims to determine the relationship between individuals' health literacy and their level of knowledge about COVID-19 and taking protective measures.

STUDY VARIABLES

Dependent Variables: The health literacy of individuals

Independent Variables: Age, gender, marital status, educational background, profession, income status, place they live, people with whom they live, having knowledge on COVID-19 and whether they find their knowledge to be adequate, topics on which COVID-19 information is needed, information resources, taking protective measures in relation to COVID-19 and the measures taken.

STUDY POPULATION AND SAMPLE

The population of the study consists of all individuals (n=10.487.540) between the ages of 18-65 living in İstanbul.[20] The sample was determined as a minimum of 139 people with a 95% confidence interval of 0.05 effect size and a 10% error rate with the sample calculation (n=N.t^2.p.q/d^2.(N-1)+t^2.p.q) in accordance with Turkish Statistical Institute (2019) İstanbul population data.[21]

Snowball sampling method was used in the research. Individuals living in İstanbul and meeting the inclusion criteria were included in the sampling. The data were collected through the Google documents (Alphabet Inc., USA) online data collection application. Participants were reached through social media networks [Twitter (Twitter Inc., USA), Instagram (Meta Inc., USA), Facebook (Meta Inc., USA), LinkedIn (Microsoft Corporation Inc., USA), WhatsApp groups (Meta Inc., USA), etc.]. Using the snowball sampling method, the participants were asked to share the link created for the research with their acquaintances. After reaching the target sampling, Google Form was closed to use. In the Information Form, one of the data collection tools, the participants were asked where they lived (province), and the forms of 8 participants who stated that they lived outside of İstanbul were excluded from the evaluation. The research was carried out with 511 people.

The criteria for inclusion in the study were determined as: being aged between 18-65 years, being at least literate, having the ability to communicate verbally, having no physical (age) and cognitive disabilities preventing them from understanding the questions, voluntary participation in the study.

DATA COLLECTION TOOLS

The data in the research were collected with Google Form. Google Form consists of two parts Information Form and Turkey's Health Literacy Scale-32 (THLS-32).

Information Form (First part): This was developed by researchers and in accordance with the literature.[22-25] The form contains a total of 15 questions, with 9 questions aimed at determining individuals' socio-demographic characteristics, and 7 questions aimed at determining their level of knowledge on COVID-19 and to what extent they take protective measures.

THLS-32 (The second part): The scale, which aims to determine the health literacy of individuals has been developed based on the conceptual framework of the European Health Literacy Survey (HLS-EU). Consisting of 32 questions, the scale includes a total of eight components, with two primary dimensions (Treatment and Service, Protection from Diseases/Improvement of Health), and four procedures (Accessing Health-Related Information, Understanding Health-Related Information, Evaluating Health-Related Information, Using/Applying Health-Related Information). The response options for the five-point Likert-type scale are listed as, Very easy (5), Easy (4), Difficult (3), Very difficult (2), and No idea (1). The formula used to calculate the scale score is Index=(average-1)x(50/3). In this formula, the index refers to the index calculated specific to the individ-

ual, and the average refers to the average of every item answered by the individual. The lowest point that can be obtained on the scale is 0, and the highest is 50. According to the points obtained from the scale, (0-25 points) states inadequate health literacy, (>25-33 points) problematic/limited health literacy, (>33-42 points) adequate health literacy, and (>42-50 points) states perfect health literacy. The scale's total Cronbach alpha coefficient is 0.95, while its sub-dimensions vary between 0.86 and 0.91.

In the study, the total Cronbach alpha coefficient was calculated as 0.93. The total Cronbach alpha coefficient for the Treatment and Service sub-dimension is 0.92, while the coefficients of the sub-processes vary between 0.69-0.83. The total Cronbach alpha coefficient for the Protection from Diseases/Improvement of Health sub-dimension is 0.92, while the coefficients of the sub-processes vary between 0.74-0.77.

DATA COLLECTION

The data were collected through the Google documents online data collection application between January 11 and February 11, 2021. Participants were reached through social media networks (Twitter, Instagram, Facebook, Linkedln, WhatsApp groups, etc.). Using the snowball sampling method, the participants were asked to share the link created for the research with their acquaintances. After reaching the target sampling, Google Form was closed to use. No time restriction was applied during the data collection process. The completion of the forms took about 8-10 minutes.

DATA EVALUATION

The data obtained was transferred to the computer by the researchers, and analyzed using the SPSS Statistics 21 (IBM, USA) program. The data were evaluated at the $p<0.05$ statistical significance level, and at the 95% confidence interval. Data analysis was performed using mean, standard deviation, frequency, percentage, Cronbach alpha, Pearson correlation t-test, Kruskal-Wallis, Tukey HSD.

STUDY ETHICS

Before starting the study, the ethics committee approval was obtained from the İstanbul University Cerrahpaşa Social and Human Sciences Research Ethics Committee (date: January 11, 2021, no: 5133). The approval to use THLS-32 was obtained from the scale owner. Since the data are collected via Google documents online data collection application (Google Form), the "Informed Consent" section was included on the first page of the form to obtain consent of the participants in order toparticipate in the research. Participants' approving this section was accepted as "consent". Google Form is made available to participants who have approved the consent form. The principles stated in the Declaration of Helsinki were followed in the research.

RESULTS

SOCIO-DEMOGRAPHIC CHARACTERISTICS OF INDIVIDUALS

The mean age of individuals is 31.36±9.16, with 69.1% of them women, and 55.6% of them married. While 56.9% of individuals are university graduates, 17.6% are high school graduates. As many as 30.1% of individuals are civil servants, 18% are self-employed, and 42.1% have income equivalent to their expenses. While 72% of individuals live in the city, 38.6% live with their spouse and children, 2.7% live with their parents and siblings.

INDIVIDUALS' LEVEL OF KNOWLEDGE ON COVID-19

As many as 70.6% of the individuals stated that they themselves, someone in their family or immediate circle was infected with COVID-19, and that the person/people who were infected with COVID-19 were first their sibling, themselves, their father, their spouse and children (Table 1).

In total, 84.1% of individuals stated that they have knowledge about COVID-19. While 56.5% of the individuals, who claimed they have knowledge about COVID-19, find their knowledge adequate, 36.4% find it somewhat adequate, and only 7.1% stated they find their knowledge inadequate. The individuals who stated that they have somewhat adequate and inadequate knowledge on COVID-19 said they primarily feel the need for information about treatment methods

TABLE 1: Individuals' level of knowledge on COVID-19 (n=511).

Themselves, their family, or someone in their immediate circle were infected by COVID-19	Yes	361	70.6
	No	150	29.4
Has knowledge about COVID-19	Yes	430	84.1
	Somewhat	78	15.3
	No	3	0.6
Finds their knowledge on COVID-19 adequate (n=508)	Yes	287	56.5
	Somewhat	185	36.4
	No	36	7.1
Subject(s) on which COVID-19-related information is needed* (n=221)	Treatment methods	185	83.7
	Modes of transmission	128	57.9
	Diagnosis methods (polymerase chain reaction test)	125	56.6
	About COVID-19 (about the disease)	113	51.1
	Protective measures (mask, distance, hygiene etc.)	75	33.9
	Quarantine process	75	33.9
	Numbers to call in emergencies	67	30.3
	Symptoms and findings	1	0.5
	Side effects that appear after the disease	1	0.5
Sources for obtaining COVID-19-related information* (n=475)	Media (newspaper/TV/radio)	308	64.8
	Internet	310	65.3
	Physician	219	46.1
	Nurse	175	36.8
	Friend/neighbor	123	25.9
	Another patient	116	24.4
	Medical books	58	12.2
	Brochures	53	11.2
	Academic publications	3	0.6
	Other	2	0.4
Takes protective measures in relation to COVID-19	Yes	452	88.5
	Somewhat	58	11.3
	No	1	0.2
Protective measures taken in relation to COVID-19* (n=510)	Washing hands frequently, using hand sanitizer	492	96.5
	Wearing the mask correctly (covering the nose)	476	93.3
	Wearing masks in every environment	454	89.0
	Avoiding crowded atmospheres (weddings, engagements, funerals etc.)	445	87.3
	Avoiding gatherings with relatives/neighbors	393	77.1
	Avoiding gatherings with friends in social atmospheres	368	72.2
	Refraining from visiting health institutes unless necessary	377	73.9
	Refraining from intercity travel	340	66.7
	Working remotely/flexible	168	33.1
	Not leaving home unless necessary	1	0.2
	Consuming supplementary food	1	0.2

*More than one option selected.

(83.7%), modes of transmission (57.9%), diagnosis methods [polymerase chain reaction (PCR) test] (56.6%), COVID-19 (about the disease) (51.1%), protective measures (masks, distancing, hygiene, etc.) (33.9%). On the other hand, the individuals who stated that they have adequate and somewhat adequate knowledge on COVID-19 said they obtained this information primarily from the media (newspaper/TV/radio) (64.8%), the internet (65.3%), from physicians (46.1%), and nurses (36.8%) (Table 1).

88.5% of the individuals stated that they took all protective measures in relation to COVID-19, while

11.3% stated they took partial protective measures. The individuals who stated they took all and partial protective measures in relation to COVID-19 said the primary measures they took included frequently washing and sanitizing hands (96.5%), wearing the mask correctly (covering the nose) (93.3%), wearing the mask in every environment (89.0%), avoiding crowded atmospheres (weddings, engagements, funerals, etc.) (87.3%), and avoiding gatherings with relatives/neighbors (77.1%) (Table 1).

INDIVIDUALS' HEALTH LITERACY

It has been found that 46.4% of the individuals have inadequate health literacy, while 41.3% have problematic-limited health literacy, 14.1% have adequate health literacy, and 6.2% have perfect health literacy (Table 2).

The total score average for THLS-32's Treatment and Service sub-dimension was found to be 24.17±9.11. The highest score average among the procedures under this subdimension was found to be Accessing Health-Related Information (10.15±2.05), with the lowest being Using/Applying Health-Related Information (7.82±1.78) (Table 3).

The total score average for THLS-32's Protection from Diseases/Health Improvement sub-dimension was found to be 23.48±8.97. The highest score average among the procedures under this subdimension was found to be Evaluating Health-Related Information (9.49±1.77), with the lowest being Understanding Health-Related Information (8.54±1.84) (Table 3).

COMPARISON OF INDIVIDUALS' SOCIO-DEMOGRAPHIC CHARACTERISTICS, THEIR KNOWLEDGE LEVEL ON COVID-19 AND THEIR STATUS OF TAKING PROTECTIVE MEASURES AND THEIR HEALTH LITERACY

A significant difference ($p<0.05$) was found between the health literacy status of individuals and the status of their families or their acquaintance catching COVID-19. It has been determined that individuals whose family oracquaintance or himself/herself has

TABLE 2: Individuals' health literacy scores (n=511).

	n	%	Index value
Inadequate health literacy-1	237	46.4	≤25 points
Problematic-limited health literacy-2	211	41.3	Between 25.1-33 points
Adequate health literacy-3	72	14.1	Between 33.1-42 points
Perfect health literacy-4	31	6.2	Between 42.1-50 points

TABLE 3: Individuals' THLS-32 sub-dimension and four procedure score average and standard deviation values (n=511).

THLS-32 sub-dimension and four procedures	Item number	$\bar{X}$±SD
Treatment and service	16	24.17±9.11
Accessing health-related information	4	10.15±2.05
Understanding health-related information	4	8.28±1.67
Evaluating health-related information	4	9.60±1.65
Using/Applying health-related information	4	7.82±1.78
Protection against diseases/health improvement	16	23.48±8.97
Accessing health-related information	4	8.67±1.84
Understanding health-related information	4	8.54±1.84
Evaluating health-related information	4	9.49±1.77
Using/Applying health-related information	4	8.72±1.67

THLS-32: Turkey's Health Literacy Scale-32; SD: Standard deviation.

TABLE 4: Comparison of individuals' level of knowledge about COVID-19 and the extent they take protective measures with their health literacy (n=511).

		THLS-32 $\bar{X}$±SD	
Themselves, their family, or someone in their immediate circle were infected by COVID-19	Yes	43.31±10.82	t=3.017
	No	37.06±9.75	p=0.002
Has knowledge about COVID-19	Yes[a]	45.21±9.59	F=49.803
	Somewhat[b]	42.43±8.57	***p<0.001
	No[c]	32.04±10.51	a>b>c
Finds their knowledge on COVID-19 adequate (n=508)	Adequate[a]	46.57±8.78	F=4.327
	Somewhat Adequate[b]	44.78±9.24	p=0.002
	Inadequate[c]	40.89±9.85	a>c
Takes protective measures in relation to COVID-19	Yes	45.73±8.49	F=50.452
	Somewhat	41.05±8.16	***p<0.001
	No	32.25±9.35	a>b>c

***p<0.001; F: One-sided variance analysis; t: t-test in independent groups; KW: Kruskal-Wallis; THLS-32: Turkey's Health Literacy Scale-32; SD: Standard deviation.

caught COVID-19 have higher health literacy than those who hasn't (Table 4).

There was a significant difference ($p<0.05$) between individuals' status of knowledge about COVID-19 and their health literacy. It has been determined that it results from those who are knowledgeable about COVID-19 and that their health literacy is higher than those who are partially informed and not, and those who are partially informed than those who are not (Table 4).

A highly significant difference ($p<0.001$) was found between individuals' status of finding their information about COVID-19 sufficient and their health literacy. It has been determined that individuals who find their knowledge about COVID-19 sufficient, have higher health literacy than those who find it insufficient (Table 4).

A highly significant difference ($p<0.001$) was found between individuals' taking protective measures against COVID-19 and their health literacy. It has been determined that the health literacy of individuals who take protective measures against COVID-19 is higher than those who partially take protective measures and do not take protective measures, and the health literacy of individuals who partially take protective measures are higher than those who do not take protective measures (Table 4).

THE CORRELATION BETWEEN INDIVIDUALS' HEALTH LITERACY AND TAKING PROTECTIVE MEASURES AGAINST COVID-19

An strong positive correlation was found between the health literacy of individuals and the protective measures (washing hands, using disinfectant, wearing the mask correctly, using masks in every environment, not going to crowded environments, not meeting with relatives/neighbors, not meeting with friends in social environments, not going to health institutions unless required, not making intercity travel) they took regarding COVID-19 ($p<0.001$). No significant relationship was found between health literacy and remote/flexible working related to COVID-19, not going out unless required, and supplementary food use protective measures ($p>0.05$) (Table 5). As the health literacy of individuals increases, the protective measures taken against COVID-19 increase, as well.

DISCUSSION

In this study, we aimed to gain deeper knowledge about the level of health literacy of individuals in Türkiye, their level of knowledge about COVID-19 and the protective measures that they take against COVID-19, and what kind of relationship between the protective measures taken against COVID-19 and health literacy. The majority of individuals in

TABLE 5: The correlation between individuals' health literacy and taking protective measures against COVID-19.

	THLS-32	
Protective measures against COVID-19	**p value**	**R**
1. Washing hands, using disinfectant	<0.001	**0.14**
2. Correct wearing of the mask to cover the nose	<0.001	**0.11**
3. Wearing a mask everywhere	**0.01**	**011**
4. Avoiding crowded places (wedding, engagement, funeral, etc.)	<0.001	**0.11**
5. Not meeting with relatives/neighbors	<0.001	**0.16**
6. Not socializing with friends	<0.001	**0.15**
7. Not going to health institutions unless necessary	<0.001	**0.29**
8. No intercity travel	<0.001	**0.11**
9. Remote/flexible work	0.73	0.03
10. Don't go out unless you have to	0.73	0.01
11. Taking supplements	0.21	0.05

THLS-32: Turkey's Health Literacy Scale-32.

Türkiye have sufficient information about COVID-19. The vast majority of individuals have inadequate and problematic-limited health literacy, while only 20.3% have adequate and perfect health literacy. As the health literacy of individuals increases, the protective measures taken against COVID-19 increase, as well.

Individuals who stated that they found the information they had about COVID-19 sufficient and partially sufficient in the study stated that they obtained this information primarily from the media (newspaper/TV/radio), internet, physicians and nurses (Table 1). This result can be evaluated as that individuals related to COVID-19 should be guided to use the internet, media, physicians, nurses and similar resources effectively in order to increase their knowledge level and obtain information on the issues they need. Turkey's Health Ministry, as well as occupational and civil society institutions are also constantly informing individuals about COVID-19 through social networks and mass communication tools. A system was developed in the U.S. to send information on protective measures in relation to COVID-19 to citizens' cellphones via mobile in SMSs. It has been observed that this practice improved individuals' health literacy and effective health behaviors, increasing self-sufficiency regarding their health.[26] It is emphasized in literature that developing technology is driving individuals to increasingly take advantage of the opportunities presented by technology to access information related to COVID-19; however, the information overload available in media and the internet world, including the rapid increase and spread of misinformation, it is not always possible for individuals to differentiate between right and wrong information, thus adversely affecting the individual and society's health.[3,11,27]

In the study, it was determined that the majority of the individuals (87.5%) had inadequate and problematic-limitedhealth literacy, only 20.3% of them had sufficient and excellent health literacy (Table 2). The findings are similar to the research results showing that individuals' health literacy is insufficient, problematic-limited in many countries from Asia to Europe.[28,29] A study conducted by Turkey's Health Ministry (2018) aimed at all age groups in Türkiye, determined that 30.9% of individuals have inadequate health literacy, 38.0% have problematic-limited health literacy, 23.4% have adequate health literacy, while only 7.7% have perfect health literacy.[30] This result suggests that educational activities should be planned to increase the health literacy of individuals and communities in order to control the COVID-19 pandemic. Thus, individuals will be able to effectively takepersonal health protective measures in relation to COVID-19, and achieve the results targeted with respect to health communication and providing health services.

In the study, as individuals' health literacy increases, the protective measures taken against COVID-19 (washing their hands, using disinfectant, wearing the mask correctly, using masks in every environment, not going into crowded environments, not meeting with relatives/neighbors, not meeting with friends in social settings, not going to healthcare institutions, not making intercity travel) increase, as well (Table 4). The findings obtained are similar to other studies.[19,31,33] Health literacy has an impact on the effective use of health information. Health literacy gives the individual the ability to acquire, understand, evaluate, and practice behaviors that best protect health regarding the COVID-19 pandemic. Health literacy supports lifelong learning and continuous learning by increasing the self-learning skills of

the individual. Hence, it is expected that individuals with high health literacy take preventive measures against COVID-19 will increase.[34] Individuals with low health literacy will be less likely to take preventive measures for COVID-19, as they have lower beliefs and concerns that they will be infected.

However, there are also studies showing that health literacy is not always positively associated with health protective measures.[35] For instance, it has been observed that low health literacy due to the misinformation of health administrators regarding vaccination or the lack of vaccination campaigns causes the society to resist vaccination.

IMPLICATIONS FOR NURSING

ICN (2021) emphasizes the responsibility of nurses in health education for public health. Nurses have the responsibility of applying health education by detecting the lack of information about the health of the patient/individual and society. Organizing training in collaboration with healthcare professionals in different disciplines (physicians, nurses, physiotherapists, etc.) aimed at boosting the society and healthy/infected individuals' health literacy regarding COVID-19; guiding individuals and the society to resources/people from where/whom they can access correct/true information in the media and on the internet, considering that the media and internet are used as the primary sources of information in our day and age, and taking into account the society and healthy/infected individuals' health literacy regarding COVID-19, may be recommended. Nurses can apply trainings to increase health literacy by taking these suggestions into account. In addition, it can be recommended to include health literacy as an elective/required course in nursing undergraduate and graduate education. A course on health literacy can be organized for public health nurses. Protecting and improving community health is among the responsibilities of nurses. For this reason, health literacy should be included in the content of nursing and health education.

LIMITATION

Since this study was conducted in the first phase of the COVID-19 pandemic, the health literacy level of the individual/society, the level of knowledge about COVID-19 and the protective measures they took could not be determined in the later stages of the crisis. In this study, the relationship between health literacy and the COVID-19 pandemic was determined, but causality could not be examined. In addition, the results of the research are limited to the self-reports of the participants.

CONCLUSION

Most individuals have adequate knowledge about COVID-19. Those who think they have inadequate knowledge feel the need for information first on treatment methods, modes of transmission, diagnosis methods (PCR test), and protective measures. They primarily obtain COVID-19-related information from the media, the internet, physicians, and nurses. The majority of individuals take all protective measures in relation to COVID-19, including frequent washing of hands, use of sanitizers, wearing the mask correctly, wearing the mask in every environment, avoiding crowded atmospheres, etc. The vast majority of individuals have inadequate and problematic-limited health literacy.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Emine Şenyuva;* ***Design:*** *Emine Şenyuva;* ***Control/Supervision:*** *Emine Şenyuva;* ***Data Collection and/or Processing:*** *Deniz Yıldırım;* ***Analysis and/or Interpretation:*** *Emine Şenyuva, Deniz Yıldırım;* ***Literature Review:*** *Emine Şenyuva, Deniz Yıldırım;* ***Writing the Article:*** *Deniz Yıldırım;* ***Critical Review:*** *Emine Şenyuva, Deniz Yıldırım;* ***References and Fundings:*** *Emine Şenyuva, Deniz Yıldırım.*

REFERENCES

1. Okan O, Bollweg TM, Berens EM, Hurrelmann K, Bauer U, Schaeffer D. Coronavirus-related health literacy: a cross-sectional study in adults during the COVID-19 infodemic in Germany. Int J Environ Res Public Health. 2020;17(15):5503. [Crossref] [PubMed] [PMC]
2. Spring H. Health literacy and COVID-19. Health Info Libr J. 2020;37(3):171-2. [Crossref] [PubMed] [PMC]
3. Abel T, McQueen D. Critical health literacy and the COVID-19 crisis. Health Promot Int. 2020;35(6):16123. [Crossref] [PubMed] [PMC]
4. Ashrafi-Rizi H, Kazempour Z. Information diet in Covid-19 crisis; a commentary. Arch Acad Emerg Med. 2020;8(1):e30. [PubMed] [PMC]
5. Van den Broucke S. Why health promotion matters to the COVID-19 pandemic, and vice versa. Health Promot Int. 2020;35(2):181-6. [Crossref] [PubMed] [PMC]
6. Information Literacy Group. CILIP Definition of Information Literacy 2018. Cited: December 4, 2020. Available from: [Link]
7. Sørensen K. Covid-19: Digital Health Literacy Is a Key to Saving Time, Costs and Lives. [Cited: 01.09.2023]. Available online: [Link]
8. Sørensen K, Pelikan JM, Röthlin F, Ganahl K, Slonska Z, Doyle G, et al; HLS-EU Consortium. Health literacy in Europe: comparative results of the European Health Literacy Survey (HLS-EU). Eur J Public Health. 2015;25(6):1053-8. [Crossref] [PubMed] [PMC]
9. Okan O, Sørensen K, Messer M. COVID-19: a guide to good practice on keeping people well informed. Conversation. 2020;19. [Link]
10. Paakkari L, Okan O. COVID-19: health literacy is an underestimated problem. Lancet Public Health. 2020;5(5):e249-e50. [Crossref] [PubMed] [PMC]
11. Sentell T, Vamos S, Okan O. Interdisciplinary perspectives on health literacy research around the world: more important than ever in a time of COVID-19. Int J Environ Res Public Health. 2020;17(9):3010. [Crossref] [PubMed] [PMC]
12. Dageforde LA, Cavanaugh KL. Health literacy: emerging evidence and applications in kidney disease care. Adv Chronic Kidney Dis. 2013;20(4):311-9. [Crossref] [PubMed] [PMC]
13. Al Sayah F, Majumdar SR, Johnson JA. Association of inadequate health literacy with health outcomes in patients with type 2 diabetes and depression: secondary analysis of a controlled trial. Can J Diabetes. 2015;39(4):259-65. [Crossref] [PubMed]
14. Parnell TA, Stichler JF, Barton AJ, Loan LA, Boyle DK, Allen PE. A concept analysis of health literacy. Nurs Forum. 2019;54(3):315-27. [Crossref] [PubMed]
15. Shieh C, Halstead JA. Understanding the impact of health literacy on women's health. J Obstet Gynecol Neonatal Nurs. 2009;38(5):601-10; quiz 610-2. [Crossref] [PubMed]
16. Kaas GA, Kasuya J, Lansdon P, Ueda A, Iyengar A, Wu CF, et al. Lithium-responsive seizure-like hyperexcitability is caused by a mutation in the Drosophila voltage-gated sodium channel gene paralytic. eNeuro. 2016;3(5):ENEURO.0221-16.2016. [Crossref] [PubMed] [PMC]
17. Speros CI. Promoting health literacy: a nursing imperative. Nurs Clin North Am. 2011;46(3):321-33, vi-vii. [Crossref] [PubMed]
18. Niemi CA, Payne AM, Bates R. Development and implementation of a health education station by community health nursing students. Public Health Nurs. 2018;35(6):581-6. [Crossref] [PubMed]
19. Wolf MS, Serper M, Opsasnick L, O'Conor RM, Curtis L, Benavente JY, et al. Awareness, attitudes, and actions related to COVID-19 among adults with chronic conditions at the onset of the U.S. outbreak: a cross-sectional survey. Ann Intern Med. 2020;173(2):100-9. [Crossref] [PubMed] [PMC]
20. Nufusu.com [Internet]. [Cited: December 05, 2020]. Turkey Population. Available from: [Link]
21. Erdogan S, Nahcivan N, Esin E. Hemşirelikte Araştırma: Süreç, Uygulama ve Kritik. 1. Baskı. İstanbul: Nobel Tıp Kitabevleri; 2014.
22. Biasio LR, Bonaccorsi G, Lorini C, Pecorelli S. Assessing COVID-19 vaccine literacy: a preliminary online survey. Hum Vaccin Immunother. 2021;17(5):1304-12. [Crossref] [PubMed] [PMC]
23. Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schünemann HJ; COVID-19 Systematic Urgent Review Group Effort (SURGE) study authors. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. Lancet. 2020;395(10242):1973-87. [Crossref] [PubMed] [PMC]
24. Peksoy Kaya S, Kaplan S. Hemşirelik öğrencilerinde COVID-19 pandemisi farkındalıklarının ve sağlık davranışlarının sağlık okuryazarlığı ile ilişkisinin değerlendirilmesi [Evaluating the relationship between nursing students' awareness of the COVID-19 pandemic and health behaviors with health literacy]. Koç University Nursing Education and Research Journal. 2020;17(4):304-11. [Crossref]
25. Leiras G, Arriaga M, Gaspar R, Raposo B, Domingos S. Implementing health literacy ıntelligence during COVID-19 outbreak. The European Journal of Public Health. 2020;30(Suppl 5):ckaa165.566. [Crossref] [PMC]
26. Brar Prayaga R, Prayaga RS. Mobile fotonovelas within a text message outreach: an innovative tool to build health literacy and influence behaviors in response to the COVID-19 pandemic. JMIR Mhealth Uhealth. 2020;8(8):e19529. [Crossref] [PubMed] [PMC]
27. Akbal E, Gökler ME. COVID-19 salgını sürecinde eksikliği ortaya çıkan bir gerçek: sağlık okuryazarlığı [Deficiency revealed during the COVID-19 outbreak process a fact: health literacy]. ESTUDAM Journal of Public Health. 2020;5(COVID-19 Special Issue):148-55. [Crossref]
28. Sørensen K, Van den Broucke S, Fullam J, Doyle G, Pelikan J, Slonska Z, et al; (HLS-EU) Consortium Health Literacy Project European. Health literacy and public health: a systematic review and integration of definitions and models. BMC Public Health. 2012;12:80. [Crossref] [PubMed] [PMC]
29. Wernly B, Wernly S, Magnano A, Paul E. Cardiovascular health care and health literacy among immigrants in Europe: a review of challenges and opportunities during the COVID-19 pandemic. Z Gesundh Wiss. 2022;30(5):1285-91. [Crossref] [PubMed] [PMC]
30. Özkan S. Türkiye Sağlık Okuryazarlığı Düzeyi ve İlişkili Faktörleri Araştırması. Ankara: T.C. Sağlık Bakanlığı Sağlığın Geliştirilmesi Genel Müdürlüğü; 2018. [Link]
31. Riiser K, Helseth S, Haraldstad K, Torbjørnsen A, Richardsen KR. Adolescents' health literacy, health protective measures, and health-related quality of life during the Covid-19 pandemic. PLoS One. 2020;15(8):e0238161. [Crossref] [PubMed] [PMC]
32. Li S, Cui G, Kaminga AC, Cheng S, Xu H. Associations between health literacy, eHealth literacy, and COVID-19-related health behaviors among chinese college students: cross-sectional online study. J Med Internet Res. 2021;23(5):e25600. [Crossref] [PubMed] [PMC]
33. Li X, Liu Q. Social media use, eHealth literacy, disease knowledge, and preventive behaviors in the COVID-19 pandemic: cross-sectional study on chinese netizens. J Med Internet Res. 2020;22(10):e19684. [Crossref] [PubMed] [PMC]
34. Bailey SC, Serper M, Opsasnick L, Persell SD, O'Conor R, Curtis LM, et al. Changes in COVID-19 knowledge, beliefs, behaviors, and preparedness among high-risk adults from the onset to the acceleration phase of the US outbreak. J Gen Intern Med. 2020;35(11):3285-92. [Crossref] [PubMed] [PMC]
35. Avelino-Silva VI, Avelino-Silva TJ, Miraglia JL, Miyaji KT, Jacob-Filho W, Lopes MH. Campaign, counseling and compliance with influenza vaccine among older persons. Clinics (Sao Paulo). 2011;66(12):2031-5. [Crossref] [PubMed] [PMC]