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RESEARCH ARTICLE

CORONAVIRUS RELATED HEALTH LITERACY: A CROSS-SECTIONAL STUDY DURING THE COVID-19 INFODEMIC IN IRAN

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ABSTRACT

INTRODUCTION:

Health literacy is the ability to obtain, read, understand and use healthcare information to make appropriate health decisions and follow treatment guidelines. This type of literacy is one of the key issues of the World Health Organization. With the onset of COVID-19 disease, the public needs to have access to new and accurate information. The present study investigated the Coronavirus-related health literacy in COVID-19 patients referred to a teaching hospital in a developing country and its relationship with demographic variables.

METHOD:

This survey research is a descriptive-analytical type. The research instrument includes coronavirus-related health literacy questionnaires (HLS-COVID-Q22) which was approved and used in 2020. Patients with COVID-19 were referred to Imam Reza teaching hospital in Mashhad-Iran from December 5, 2020 to July 5, 2021.The samples were selected using a sample size determination formula of 190 people. Statistical analysis was performed with SPSS26 software.

RESULTS:

The overall average score of health literacy related to coronavirus in patients with COVID-19 at Imam Reza teaching hospital in is 84.31 which is the desired level. Among the dimensions of health literacy, the highest score belonged to "Understanding health information" (D3) with a mean (standard deviation) of 23.38 (5.66) and the lowest score belonged to "Evaluate health information" (D1) with a mean (standard deviation) of 19.03 (4.69). According to the p- value (0.001) of the test, "Age" as a demographic factor, is the only factor that has been associated with health literacy related to the coronavirus.

CONCLUSION:

Although the level of Coronavirus-related health literacy is favorable in this study, the participants in this study were mostly patients who were able to answer the research questions, were not hospitalized, had a sufficient level of literacy to understand the questionnaire questions, and most of them were medical staff who were familiar with the components of health literacy. However, considering that health literacy training related to Coronavirus has an effective role in disease prevention and control, therefore, creating and promoting the necessary platform for teaching the components of health literacy, especially for elders is recommended by trustees and policymakers. Lack of proper evaluation of information sources leads to improper health practice. So, holding training sessions, using social media facilities, holding workshops

and developing programs related to teaching health literacy-related components of COVID-19 in public media will help increase public awareness during the Corona pandemic.

KEYWORDS
coronavirus, health literacy, COVID-19, developing countries, Iran.

INTRODUCTION

In late 2019, a new strain of Coronavirus called COVID-19 was reported from Wuhan, China, which caused a great deal of anxiety and panic among the people of the world as the disease spread rapidly in China and then to other parts of the world. . The World Health Organization (WHO) said in a statement that the virus was causing a public health emergency around the world. [1]

We all faced "infodemic" related to the COVID-19 epidemic, which led to the release of large amounts of valid and invalid information around the world. Infodemic is an "information epidemic", a phenomenon that depicts the spread and amplification of large amounts of valid and invalid information on the Internet or through other communication technologies. [2]

With the onset of the COVID-19 epidemic, the production and consumption of corona-related information have increased rapidly and significantly. [3]

The rapid spread of the virus, the lack of vaccines, and definitive specific treatment at the time of the outbreak caused countries to face large numbers of infected people and create challenges in various areas of health, economic, political, social, and so on. Some of these challenges are directly and indirectly related to people's health literacy. Improving the level of health literacy can solve or reduce some of these challenges.

Health literacy has been recognized in recent years as one of the most important skills for making appropriate decisions in difficult situations for patients (4). Health literacy means obtaining health information from the right sources and using the information correctly to interpret it to improve our health. [5]

Health literacy helps a person make informed choices and manage their health status more appropriately. [6] Health literacy is not only related to the individual but can also be effective as a social component of health and affect society. [7]

In other words, health literacy is one of the basic skills needed by people to find, understand, evaluate, communicate and use information and health services. [8] It is used in different forms in different environments throughout life to promote a person's health. Increasing health literacy in populations is critical to achieving equal access to health services. [9]

In recent years, improving health literacy related to the specific type of diseases such as Corona [2], hypertension [10], diabetes [11], and some other diseases like these, has become an important skill for patients that can increase their decision-making power in difficult health situations. This matter can reduce health threats, effective prevention of patients, increase the quality of life, and improve the quality of patient care.

Also, promoting health literacy can improve the access and use of health services in different groups of society and prevent the imposition of huge costs of diagnosis and treatment on the country's health system. [12,13]

Reviews in the field of COVID-19 show that Coronavirus-related health literacy has become particularly important with the spread of the disease. [14]

These days information about COVID-19 has been published on most channels and information networks. People empowered with Coronavirus-related health literacy components can distinguish between reliable and inaccurate information about COVID-19. [2,4,15–19]

This matter leads to more effective use of reliable information resources and consequently more effective use of health services and enables people to make informed health decisions and engage in healthy and protective behaviors. [2]

Our investigations showed that no research has been conducted to assess Coronavirus-related health literacy in Iran. This cross-sectional study aims to evaluate coronavirus-related health literacy among patients with COVID-19 referred to a teaching hospital in Iran. The results of this study can clarify the level of health literacy in patients; provide valuable information to health policymakers and administrators for effective and targeted planning to improve Coronavirus-Related Health Literacy.

METHODS

This cross-sectional survey is a descriptive applied study.[20] The population of the study includes all patients diagnosed with COVID-19 referred to Imam Reza teaching hospital of Mashhad-Iran. University of Medical Sciences from December 5, 2020 to July 5, 2021 who were moderately ill at the time of referral and could fill in the questionnaire or reply to the questions of the interviewer.

Considering the minimal value of correlation between the health literacy related to COVID-19 score and demographic variables at the level of 0.20 and the significance level of 0.05 and the power of 80%, the sample size has been calculated using the formula below:

$$n = \left(\frac{z_{1-\frac{\alpha}{2}} + z_{1-\beta}}{0.5 \ln(\frac{1+r}{1-r})} \right)^2 + 3$$

Using this sample size formula, 190 patients were studied who all declared their consent to participate in the study 230 questionnaires were distributed among the available statistical population. A total of 190 questionnaires, as many samples as needed, were returned.

The assessment tool used in this study is the Corona Virus-related Health Literacy Questionnaire, which was approved and used in 2020 [2], this tool includes 22 questions in 4 dimensions, including (D1) evaluate health information (5 questions), (D2)Access health information (6 questions),(D3) Understanding health information (6 questions) and (D4) apply health information (5 questions).These questions were answered on a 5-point Likert scale (5 = Always, 4 = Most of the time, 3 = Sometimes, 2 = Seldom, 1 = Never). The adequate level of health literacy is between 81-110, the borderline level is between 52-80, and the inadequate level is between 22-51. The internal consistency of the questionnaire was confirmed with Cronbach's alpha coefficient of 0.94%; its reliability calculated with a correlation coefficient of 0.96% was confirmed. [2]

Data were analyzed using SPSS26 software. Descriptive statistics including frequency, percentage, mean, median and standard deviation are used to perform descriptive statistics. Pearson's correlation coefficient was used in the inferential statistics section.

RESULTS

DEMOGRAPHICS:

Responses show that 52.1% of the participants were female (n=99) and 47.9% of them were male (n=91). Most of the participants were between 30 - 50 years old (54.2%) , under-educated (41.6%) and employed medical staff (86.3%) . The monthly income of most participants was between 30-60 million Rials (64.2%). The level of English proficiency among the participants was moderate (54.2%).

TABLE 1: DEMOGRAPHIC INFORMATION OF THE PARTICIPANTS

Variables	(n=190)	Frequency	Percentage %
Gender	Male	91	47.9
	Female	99	52.1
Age	< 30	72	37.9
	30-50	103	54.2
	>50	15	52.1
Education	Diploma and less	79	41.6
	Associate	11	5.8
	Bachelor	73	38.4
	Master and higher	13	6.9
Work status	Unemployed	3	1.6

	Homemaker	9	4.7
	Retired	4	2.1
	Student	10	5.3
	Employed medical staff	164	86.3
Household income	Below 30 million Rials	7	3.7
	30 – 60 million Rials	122	64.2
	60 million Rials +	27	14.2
English language proficiency	Very High	17	8.9
	High	55	28.9
	Moderate	103	54.2
	Low	11	5.8
	Very Low	2	1.1

TABLE 2: TYPES OF HEALTH INFORMATION SOURCES RELATED TO COVID-19

	Variables	Variable levels	Frequency	Percentage %
1	Physicians and health staff	No	61	32.1
		Yes	129	67.9
2	Internet	No	104	54.7
		Yes	86	45.3
3	Interactive Voice Response	No	184	96.8
		Yes	6	3.2
4	Radio/ Television	No	147	77.4
		Yes	43	22.6
5	Magazine/ Newspaper	No	171	90
		Yes	19	10
6	Friends and acquaintances	No	157	82.6
		Yes	33	17.4
7	Brochure/Booklet/Leaflet	No	163	85.8
		Yes	27	14.2
8	Search engines (Google, Yahoo, Bing)	No	93	48.9
		Yes	97	51.1
9	Life sciences and biomedical information databases	No	131	68.9
		Yes	59	31.1
10	Social Media	No	96	50.5
		Yes	94	49.5
11	Health websites on COVID-19	No	155	81.6
		Yes	35	18.4
12	Website of infectious diseases specialists	No	159	83.7
		Yes	31	16.3
13	Others	No	171	90
		Yes	19	10
14	I do not actively search for information	No	182	95.8
		Yes	8	4.2

Most of the participants obtained the information related to COVID-19 mostly by asking "Physicians and health staff" (67.9%). After this, "Internet" (45.3%), "Radio/ Television" (22.6%), "Friends and acquaintances" (17.4 %) and "Brochure/Booklet/Leaflet" (14.2 %) were each respectively the source of health information related to COVID-19. Also among the internet-based sources of health information related to COVID-19 used among the participants were search engines such as Google, Yahoo, and Bing (51.1%) After this, social media (49.5%), life sciences and biomedical information databases (31.1%), health websites on COVID-19 (18.4%), and Website of infectious diseases specialists (16.3%) were the Internet-based sources for obtaining information related to COVID-19, respectively.

It shows that the mean (standard deviation) of health literacy is 84.31 (18.41). Among the dimensions of heath literacy, the highest score belonged to "Understanding health information" (D3) with a mean (standard deviation) of 23.38 (5.66) and the lowest score belonged to "Evaluate health information" (D1) with a mean (standard deviation) of 19.03 (4.69).

TABLE 3: CORONAVIRUS-RELATED HEALTH LITERACY RATES IN PARTICIPANTS

Variables	Dimensions		Min	Max	Mean	SD
Coronavirus-Related Health Literacy	D1	Evaluate health information	5	25	19.03	4.69
	D2	Access health information	6	30	22.21	4.88
	D3	Understanding health information	6	30	23.38	5.66
	D4	Apply health information	5	25	19.67	4.78
Total (N=190)			22	110	84.31	18.41

TABLE 4: CORONAVIRUS-RELATED HEALTH LITERACY LEVEL BASED ON THE GENDER OF PARTICIPANTS

	Inadequate health literacy		Borderline health literacy		Adequate health literacy		Total	
	Frequency	Percentage %	Frequency	Percentage %	Frequency	Percentage %	Frequency	Percentage %
Female	5	5.1	29	29.3	65	65.7	99	100
Male	7	7.7	22	24.2	62	68.1	91	100
Total	12	6.3	51	26.8	127	66.8	190	100

Results show that 65.7% of women and 68.1% of men in this study had an adequate level of health literacy. 5.1% of women and 7.7% of men had an inadequate level of health literacy.

26.8% of participants had borderline health literacy.

According to the p-value for the test reported, it can be said that only "Age" (p-value 0.001) affects the level of Coronavirus-Related Health Literacy. "Gender" (p-value 0.705), "Education" (p-value 0.14) and "Household income" (p-value 0.871) don't affect the level of Coronavirus-Related Health Literacy.

TABLE 5: THE IMPACT OF AGE, GENDER, EDUCATION AND HOUSEHOLD INCOME ON CORONAVIRUS-RELATED HEALTH LITERACY LEVEL

Age	Min	Max	Mean	SD	p-value
< 30	22	109	85.25	16.36	0.001
30-50	22	110	86.43	16.20	
>50	25	108	65.20	29.63	

Gender	Min	Max	Mean	SD	p-value
Women	22	110	84.79	17.85	0.705
Men	22	110	83.87	19.09	
Education					
Diploma and less	22	110	82.08	18.02	0.14
Associate	59	109	89.18	17.18	
Bachelor	22	109	88.26	15.75	
Master and higher	25	109	86.76	22.80	
Household income					
Below 30 million Rials	72	109	89.14	14.73	0.871
30 – 60 million Rials	22	110	87.24	16.55	
60 million Rials +	60	109	89.29	13.95	

P-value<0.05

TABLE 6: INFERENTIAL STATISTICS OF THE PAIRWISE COMPARISON OF CORONAVIRUS-RELATED HEALTH LITERACY LEVEL BY AGE

Age	Variables	Min	Max	MD	SD	p-value
<30	30-50	-7.72	5.35	-1.18	2.70	1.00
	>50	7.96	32.13	20.05	5.00	0.001
30-50	>50	9.46	33.00	21.23	4.87	0.001

It is seen that there is no significant difference in Coronavirus-Related Health Literacy levels in the group of less than 30 years and 30 to 50 years, but there is a significant difference in Coronavirus-Related Health Literacy levels in other groups.

DISCUSSION

Health literacy is important for every person if they are to meet the problems related to health or not. We all need to be able to find, understand, and use health information and services. Taking care of our health is part of everyday life, not just when we visit a doctor, clinic, or hospital. Health literacy can help us prevent health problems, protect our health, and better manage health problems when they arise. [21] As a public health strategy, health literacy as a social vaccine enables individuals and communities to reduce the spread of the virus by understanding and applying the information provided through governments and health authorities. [15] The research findings in this study, which was conducted in a teaching hospital, showed that the overall average score of health literacy related to coronavirus in patients with COVID-19 at Imam Reza teaching hospital in is 84.31 which is the desired level. These results are consistent with the research of Okan [2], Li [22], and also the study by Silva et al. [18] It seems that the participants were interested in performing protective preventive behaviors in the coronavirus epidemic, and the high level of health literacy related to the coronavirus indicates this claim. In the study of McCaffery et al., it is also mentioned that the level of sufficient health literacy causes adherence to preventive behaviors in the face of the coronavirus, and it is in line with the present study. [23] In the study of Niu et al., the average score for performing preventive behaviors is at a favorable level, so it can be said that it is in some way aligned with the results of the present study. [24] The findings of Eronen et al.'s study are also consistent with this research. [25] Of course, it should be kept in mind that the patients with coronavirus in this study were mostly patients who were able to answer the research questions, were not hospitalized, had a sufficient level of literacy to understand the questionnaire questions, and most of them were medical staff who were familiar with the components of health literacy. These factors can have an on increasing the average score of health literacy related to the coronavirus, which is consistent with the findings of Do et al.'s research. [26] Corona patients hospitalized in this hospital were not in a condition to answer the questions of the questionnaire. The more acute disease in this group of patients may be due to the lower level of health literacy and less preventive behavior.

However, 33.2% of the participants in this study had borderline and insufficient health literacy. The average score of health literacy in the dimension of "evaluate

health information" and "Apply health information" is low compared to other dimensions. Health information can be extremely useful, empowering us to make important health decisions. However, health information also can be confusing and overwhelming. Given the wealth of information available through the Internet, journals and other sources, it's important to be able to assess its quality. Therefore, to improve these dimensions, it is suggested to provide effective training in the field of health information and then the effective use of this information in health situations. While the general level of health literacy is high, the participants had difficulties in facing the information about the coronavirus. Since COVID-19 is a global pandemic, the stress and anxiety caused by the disease have caused everyone to seek health information about COVID-19. This requires the formation of targeted public information campaigns and promotion of public health literacy to identify misinformation, and as a result, decisions will be based on correct and reliable information and better performance will take place.

Social media is an effective tool to promote the prevention behaviors of COVID-19 among people. Therefore, effective training in this field can be done through social networks and mass media. The availability of information has an undeniable effect on the health literacy of patients. Also, librarians can be effective in evaluating health information related to the coronavirus by teaching them how to search for information and specialized information.

In this Study, "age" as a demographic factor, is the only factor that has been associated with health literacy related to the coronavirus, which means that increasing age has been associated with a decrease in the level of literacy related to the coronavirus. Therefore, health politicians should prepare related educational programs and design appropriate interventions to improve and increase the level of health literacy related to the coronavirus, especially for elders.

Although we tried our best to make the research as comprehensive as possible, but we had some limitations. The research population was people who were able to complete the questionnaire, were not hospitalized, had a sufficient level of literacy to understand the questionnaire questions, and most of them were medical staff who were familiar with the components of health literacy. We did not have access to the information of people hospitalized.

CONCLUSION

Holding training sessions, using social media facilities, holding workshops, and developing programs related to teaching health literacy-related components of COVID-19 in public media will help increase public awareness during the Corona pandemic.

ETHICS STATEMENT

This research was approved by the Shahid Beheshti University of Medical Sciences (IR.SBMU.RETECH.REC.1400.111)

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CONFLICT OF INTEREST

The authors have no conflicts of interest to declare.

AUTHOR CONTRIBUTIONS

Zandkrimi, Sana: writing—original draft preparation
Kazerani, Maryam: methodologist, writing—review and editing, supervisor.
Mottaghi, Mahdieh: data gathering.
Kazerani, Marzieh: infectious disease specialist, advisor
Jambarsang, Sara: statistical advisor

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