

Health Literacy and Self-care Behavior during COVID-19 Pandemic

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ABSTRACT. The Coronavirus is a large family of viruses that can cause respiratory infections. During the COVID-19 pandemic, there are many challenges, including the health literacy (HL) of society. On the other hand, self-care is a multidimensional structure that requires other behaviors influenced by factors such as health beliefs, economic situations and life events. The aim of the study was to determine the relationship between health literacy and self-care behaviors in the prevention of COVID-19 among the citizens of the city of KHAf. This cross-sectional study was conducted on 300 citizens aged 18 to 65 years in KHAf cities selected through a stratified random sampling method in the first half of 2021. The data collection tool was a questionnaire containing demographic information, health literacy (HL), and self-care questionnaire in the prevention of COVID-19. Data were analyzed using SPSS software and independent samples t-tests, one-way analysis, Pearson's correlation coefficient. The statistical significance level was set at $p < 0.05$. The results showed that the mean age of the participants was 32.32 ± 8.03 years. The results of the Pearson correlation test showed there was a significant and positive relationship between HL and self-care behavior ($r = 0.43$, $p < 0.001$). HL had a positive relationship with self-care behaviors in the prevention of COVID-19 which requires further research and provides an incentive to develop and test special educational interventions at the level of HL to improve self-care in the prevention of COVID-19.

Keywords: Health literacy; self-care behaviors; COVID-19.

Received on September 18, 2022.

Accepted on May 25, 2023.

Introduction

Coronavirus (COVID-19) is a large family of viruses that can cause respiratory infections ranging from the common cold to more severe diseases such as MERS and SARS (Weiss & Navas-Martin, 2005). This virus spreads naturally in mammals and birds, but, seven human-transmitted coronaviruses have been discovered so far (Weiss & Navas-Martin, 2005). Its most recent type, the new coronavirus, spread to human pandemic in Wuhan, China, in December 2019 (Pourhaji, F et al., 2022).

This virus has also entered Iran since the beginning of March 2018 and has affected all provinces and cities. The World Health Organization (WHO) has recently announced this disease as a pandemic (Tavakoli, Vahdat, & Keshavarz, 2020; Delshad, Pourhaji, & Zarmehri, 2022). All countries are adopting and performing similar measures to deal with this disease, depending on the type of the political, social and cultural system, as well as the strength of their healthcare system and economic conditions. This disease, which still has many unknown dimensions and has caused a negative shock to the economies of families, business and the macroeconomy of the world, makes it necessary for all nations to work with their governments in the shortest possible time and the least losses to overcome the damage caused by this disease (Tavakoli et al., 2020; Delshad, Abdollahi, Pourhaji, Azhdari Zarmehri, & Heidarnia, 2022).

There are many reasons to be concerned about the acute impact of COVID-19 on the well-being of the family and the general population (Mousavi et al., 2021), so the COVID-19 epidemic has become a serious crisis not only for public health and economic stability, but also for family well-being (Prime, Wade, & Browne, 2020).

There are many challenges in this epidemic, including the health literacy of society (Coronavirus, 2019; Kent, Ornstein, & Dionne-Odom, 2020; Zarocostas, 2020).

Health literacy (HL) includes a set of reading, listening, analyzing, and decision-making skills, as well as the ability to apply these skills in health situations, which are not necessarily related to years of education or general reading ability (Carollo, 2015). Therefore, WHO has introduced HL as one of the most important determinants of health and has recommended that countries around the world form an association of all people affected by this issue to monitor and coordinate strategic activities to improve the level of HL in different societies (Health, 2008).

It is not yet clear to what extent HL affects health outcomes, but according to the studies, many unpleasant health outcomes are due to insufficient HL (Cho, Lee, Arozullah, & Crittenden, 2008). In a national study conducted in Iran, 44% of people had limited HL. According to this study, approximately one in two Iranians had limited HL (Tavousi et al., 2016).

When COVID-19 quickly emerged, two aspects were noteworthy. First, HL is as important globally for prevention of communicable diseases as it is for non-communicable diseases. Second, in addition to preparing the healthcare system, individual preparation for solving complicated life problems and achieving health information has become important.

The development of HL is more important than ever to prepare people for situations that require a quick response. Above all, HL should be understood as social responsibility and solidarity (Paakkari & Okan, 2020). As HL has remained both an underestimated concept and neglected research in the field of the COVID-19 epidemic (Paakkari & Okan, 2020), researchers from various disciplines have emphasized the need for HL in the community and its role in the different diseases areas of COVID-19 (Abel & McQueen, 2020; Ashrafi-Rizi & Kazempour, 2020; Sentell, 2020; Van den Broucke, 2020; Okan, et al., 2023c).

HL can facilitate distinguishing between reliable information about COVID-19 and reject misinformation about the topic, it helps navigate health information sources and health services, and HL empowers people to make informed health decisions and perform healthy and protective behaviors against COVID-19 disease (Ashrafi-Rizi & Kazempour, 2020; Okan, Sørensen, & Messer, 2020b; Paakkari & Okan, 2020).

There are several reasons about the importance of investigating HL in COVID-19 patients and its relationship with other components related to this disease. A study about COVID-19 says that a high level of HL may reduce the level of fear (Pourfridoniet al., 2022).

In another study, a higher level of HL had protective effects against depression related to COVID-19 (Nguyen et al., 2020). It should be noted that in this study, HL was measured using a short 12-question questionnaire that has been validated in the general population of Asia (Duong Tuyen et al., 2019a) and Vietnam (Duong Tuyen et al., 2019b).

Understanding public health recommendations, applying protective measures against infection with the coronavirus, and navigating the health information environment related to COVID-19 have currently of great importance (Okan et al., 2020b; Sentell, 2020).

People who have high HL have good cooperate with health service centers and perform health orders as well. On the other hand, individuals with weak HL skills have less knowledge about health, receive fewer preventive services, the control of chronic diseases is worse with them, have poorer physical and mental health performance, and finally, these cases can affect the level of self-care (Ishikawa & Yano, 2008).

Self-care is a multidimensional structure that requires other behaviors that are influenced by factors such as health beliefs, economic situations, and life events (Stys & Kulkarni, 2007) and includes all activities related to health preservation, prevention, and treatment of diseases by the individuals (Gohar, Greenfield, Beevers, Lip, & Jolly, 2008).

The important principle of self-care is participation and acceptance of responsibility by the patient, having the ability to perform self-care activities, and the ability to understand and recognize these activities (Martínez, Connelly, Pérez, & Calero, 2021). Self-care ability is influenced by different factors such as age, gender, developmental status, health status, life experiences, and social-cultural awareness (Didarloo et al., 2012).

An person with HL is able to recognize their information needs, identify and retrieve reliable sources of information, use information effectively and share the information with others when needed.

A person with HL is always in search of new knowledge and is ready for lifelong learning. Therefore, a person with HL is expected to perform better than others in searching for health-related information, better identify reliable health sources, distinguish correct information from incorrect and invalid information, and make better use of needed health information. A new look at the HL definition and self-care also reveals a focus on the concept of information, and the skills needed to obtain, evaluate, and use the information to maintain health. This issue also demonstrates the logical connection between these two topics.

Due to the rapid spread and pandemic of the new coronavirus disease COVID-19 and the need to investigate the relationship between HL and self-care behavior in the prevention of COVID-19 disease, as well as to conduct a study on the general population's perspective on HL and self-care in the prevention of COVID-19 and whether or not they have needed HL for self-care and have a positive attitude. This study was conducted with the aim of determining the relationship between HL and self-care behaviors in the prevention of COVID-19 among the citizens of KHAF city.

Methods

This cross-sectional study was conducted in the first half of 2021. The statistical population of this research was the citizens aged 18 to 65 years in the town of KHAF, selected through a stratified random sampling method. KHAF county is located in Razavi Khorasan province of Iran. It is a small border town about 350 km (or 265 km) from Mashhad.

For the first recruitment, the county contains five cities: KHAF, Nashtifan, Qasemabad, Salami, and Sangan. Therefore, each section is considered as a class and samples were taken equally from each section. The researcher contacted the study participants through the telephone number listed in the health record through individual phone calls and obtained their verbal consent informed. An information document with the details of the survey (i.e., the title of the research, the aim of the study, privacy information, and the researchers' telephone numbers) was distributed among potential participants and any questions that these participants had about the study were answered. In this study, an URL linking to the consent form was sent to each participants who agreed to participate, and consent to participate was confirmed through electronic signature (the ticking of the box on the form). After the consent form was received, an URL for the Google Forms questionnaire was sent to the participants by social-media applications and text messaging, which returned 320 (93%) responses. Inclusion criteria included: at least literate in reading and writing literacy, access to a smart mobile phone and virtual space to receive the link to the electronic questionnaire, and consent to participate in the study, and the exclusion criteria included incomplete completion of the questionnaires.

The sample size was set at 300 individuals with a 95% confidence and 5% estimation error, according to previous studies (Haghdoost et al., 2019) regarding the optimal level of HL of about 30% and finally taking into account the possibility of attrition and deficiency in data completion, about 330 people participated the study. With the help of the following formula and based on similar studies:

$$n = \frac{Z^2 pq}{d^2}$$

The data collection instrument contained of a three-part questionnaire. The first part related to demographic information such as age, gender, marital status, educational level, and occupation. The second sub-instrument was a research-made questionnaire based on the HL questionnaire of Montazeri et al. (Montazeri et al., 2014), and designed by studying a related article (Montazeri et al., 2014; Alizadeh Aghdam, Koohi, & Gholizadeh, 2017). This questionnaire is divided into 5 components and 17 items. The dimensions of the questionnaire include reading (2 items), access (5 items), understanding (2 items), appraisal (4 items), and decision (4 items).

The questions on the HL questionnaire are scored using a five-point Likert scale (always, most of the time, sometimes, rarely, never). The number 1 points to the lowest score and the number 5 points to the highest score. The lowest total score of the tool is equal to 17 and the highest score is equal to 85. The scoring of the questionnaire researcher ranges: from 17 to 38 in weak HL, 39 to 62 in moderate HL, and from 63 to 85 in a good HL level (Montazeri et al., 2014).

The reliability and validity of the HL questionnaire was measured by Montazeri and colleagues in Iranian society. This study showed that this tool has adequate validity and its reliability is 0.89-0.72 (Montazeri et al., 2014). The third part includes the self-care questionnaire made by the researcher in the context of COVID-19 prevention. This questionnaire with 13 items in 5 components was designed by the researcher using the study of related research (Montazeri et al., 2014; Alizadeh Aghdam et al., 2017).

The dimensions of this questionnaire included healthy eating (3 items), physical activity (2 items), stress management (3 items), smoking (2 items), awareness and responsibility for health status, and knowledge of COVID-19 (3 items). The items of the questionnaire were scored based on a five-point Likert scale (always, most of the time, sometimes, rarely, never). The number 1 points to the lowest score and the number 5 points to the highest score. In this questionnaire, the lowest score was 13 and the highest score was 65. The researcher scored the questionnaire such that 13 to 29 were considered poor, 30 to 47 were considered moderate, and 48 to 65 were considered good. Considering that these tools not used to measure HL and self-care behaviors in the prevention of COVID-19 disease, an expert panel (N=10) of health education and health promotion experts was used to assess the area and content validity ratio (CVR) and content validity index (CVI) was calculated. The CVR was 0.79 and the CVI was 0.81. To determine the reliability of the HL and the self-care questionnaire in the prevention of COVID-19 disease, used Cronbach's alpha coefficient ($\alpha = 0.79$) and ($\alpha = 0.82$) were used. Data were analyzed using SPSS software and independent samples t-tests, one-way analysis, Pearson's correlation coefficient were applied to determine the correlated variables. The statistical significance level was set at $p \leq 0.05$.

Ethics approval

The study was approved by the Ethics Committee of Mashhad University of Medical Sciences (ID: IR.THUMS.REC.1400.255) of which the authors are affiliated. In this study, all respondents consented prior to beginning the survey.

Results

The results showed that the average age of the participants was 32.32 ± 8.03 years. 40% of the participants were female and 60% male (Table 1).

The results of the ANOVA test revealed that graduate participants showed statistically higher levels of HL and self-care behaviors, compared with other participants ($P < 0.001$). The findings showed that the healthcare employee participants had the highest level of HL score. The participants' sociodemographic characteristics are presented in (Table 2).

The total mean score for HL was 60.01 ± 7.01 . The findings indicated the level of HL was moderate (57%) (Table 3). The results showed the mean of HL dimension scores in the prevention and control of the COVID-19 disease is in different ranges, and the highest score is related to the access dimension, and the lowest is related to the understanding dimension (Table 4).

The results of the Pearson correlation test showed there was a significant and positive relationship between HL and self-care behavior ($r = 0.43$, $p \leq 0.001$).

Table 1. Demographic information and physical health status of participants.

Variable	Categories	Number (%)
Gender	Female	120(40)
	Male	180(60)
Marital status	Married	270(90)
	Single	30(10)
Level of education	Elementary school	21(7)
	Middle school	36(12)
	High school and diploma	110(36.7)
	Graduate	133(44.3)
Occupation	Unemployed	14(4.66)
	Worker	14(4.66)
	Housewife	85(28.33)
	Healthcare employee	96(32)
	Non-medical employee	19(6.33)
	Self-employed	72(24)

Table 2. Comparison of health literacy score and self-care behavior based on demographic variables.

Variable	Categories	Health literacy	Self-care behaviors
		mean±SD	mean±SD
Gender	Female	60.56±8.17	17.50±5.16
	Male	59.56±7.22	18.28±4.39
	t-test result	P=0.134	P=0.177
Marital status	Married	60.13±8.12	17.90±4.9
	Single	60.09±7.05	17.06±4.45
	t-test result	P=0.806	P=0.376
Educational level	Elementary school	46.90±7.48	16.99±4.71
	Middle school	51.30±3.67	21.19±5.34
	High school and diploma	62.32±5.76	16.89±4.16
	Graduate	62.72±5.71	22.09±3.96
	ANOVA test result	P≤0.001	P≤0.001
Occupational status	unemployed	55.92±8.27	20.78±2.91
	worker	60.92±4.84	16.00±2.35
	Housewife	60.58±7.28	18.04±4.84
	Healthcare employee	61.96±7.46	17.89±4.61
	Non-medical employee	56.52±8.04	17.28±4.77
	Self-employed	58.62±7.78	18.01±5.58
	ANOVA test result	P=0.003	P=0.125

Table 3. The status of the health literacy score of the research sample.

Variable (health literacy)	Number (%)
Moderate (39-62)	171(57)
Good (63-85)	129(43)

Table 4. Mean and standard deviation of health literacy dimensions.

Variable (Health Literacy dimension)	Mean	Standard deviation
Reading	12.91	5.04
Access	20.88	3.45
Understanding	9.4	1.15
Appraisal	16.64	2.76
Decision	13.53	1.87

Discussion

This study was conducted with the aim of determining the relationship between HL and self-care behavior in the prevention of COVID-19 among the citizens of KHAF city.

The results of this study showed that about 57% of the participants had low HL, while in the study of Budaghi et al.(Boudaghi & Arabi, 2021), this rate was higher than average at 112.43.

In a study conducted by Okan et al. (2020a) in Germany on the assessment of people's health literacy in the area COVID-19 disease, it was found that about half of the participants had favorable HL in relation to the COVID-19 disease, while 15% had an average level of literacy, and 35% had an unfavorable level of literacy.

In the study of Yousefi et al. (Yusefi et al., 2022), the level of HL was reported at a low level, while in the studies of Panahi et al. (Panahi, Dehghankar, & Anbari, 2021), Azimi, Sharifi Moghadam, et al. (Ramezankhani, Ghafari, Rakhshani, Ghanbari, & Azimi, 2015), Paasche et al. (Paasche-Orlow, Parker, Gazmararian, Nielsen-Bohlman, & Rudd, 2005), the level of HL among the participants was reported to be borderline and average.

The results of this study showed that about half of the participants had doubts about the validity of the information they receive the area of COVID-19. According to the present study, this result shows that although the public is confronted with important information in the field of COVID-19, they may lack the necessary skills to analyze this information and distinguish between valid information.

The results of the study by Dadaczynski et al.(Dadaczynski et al., 2021), which investigated digital HL and internet information search behaviors among students during the COVID-19 pandemic, show that the most important problem of the research participants is the assessment of the accuracy and examination of commercial and non-commercial goals of the information they obtained. In addition, the students surveyed indicated that they have serious problems finding the specific information they want.

HL had a positive relationship with self-care behavior in the prevention of COVID-19. These results have created a new awareness about the positive relationship between HL and self-care behavior, which requires further research and encourages specific educational interventions to be developed and studied at the HL level to improve self-care in the prevention of COVID-19. In the current study, there was no significant difference between HL and gender and self-care behavior and gender, while in the study of Dadaczynski et al. (Dadaczynski et al., 2021), the analytical score was lower in women than in men. In the study by Safari et al. (Saffari, Sanaeinasab, Rashidi-jahan, Rahmati, & Pakpour, 2021) the analysis score was lower in women, but the difference was not significant which is confirmed by the present study.

According to Safari et al. (Saffari et al., 2021)'s study, the research subjects had problems in the analysis dimension and could not analyze the information received well, which may be due to the fact that the information provided did not match the ability level of the audience. It seems that it is important and necessary to consider the cultural level and characteristics of the audience when designing the media. The results of the study by Szmuda et al. (Szmuda et al., 2020) have shown that many of the health education topics related to the COVID-19 disease were not understandable to ordinary people and it was difficult for many people to understand their meaning. Similar to the present research, in the Safari et al. (Saffari et al., 2021)'s study it was found that the score of the understanding sub-scale was not very high compared to other subscales. This fact indicates that it is necessary that the topics intended for people are perceived in terms of comprehension level and understanding ability and try to provide in colloquial language and more comprehensible.

In a study conducted by Abdulai et al. (Abdulai, Tiffere, Adam, & Kabanunye, 2021) in Ghana investigating digital literacy rates in the context of Covid-19, it was concluded that the level of digital health literacy was high, but their ability to distinguish valid from invalid information and the ability to obtain appropriate information in the area of COVID-19 disease was unfavorable. In the Saffari study (Saffari et al., 2021), the results were similar to the Ghana study (Abdulai et al., 2021). Importantly, in all three studies, despite the high level of HL, people still struggled with how to find and search for relevant information and how to evaluate it. In the current study, there was no significant relationship between age and HL, despite other studies (Estacio, Whittle, & Protheroe, 2019; Joveini, Rohban, Askarian, Maheri, & Hashemian, 2019) indicating that it is expected that the older people get and the more experiences they have, the more HL they will have.

The findings of the present study showed that there was a significant relationship between educational status and HL such that individuals with graduate degree had higher HL.

The results of the Pearson correlation test showed that there was a significant relationship between HL and the self-care behavior of the research subjects, so that this relationship was positive. This relationship means that the higher the HL of the participants, the higher the self-care behaviors in preventing COVID-19 disease. Similar to the present study a significant and positive relationship between health-promoting behaviors and health literacy among women during the COVID-19 pandemic was found in the study by Yusefi et al. (Yusefi et al., 2022). HL among healthcare recipients can be considered an important factor in people's decisions and behaviors to promote and improve their health, especially during the COVID-19 pandemic.

The present study has some limitations that should be noticed when interpreting the results. Considering the corona conditions and the use of social networks to send and complete the questionnaire, it can be said that the participation of people who are not members of such networks is possible, so it can be said that the present sample is not representative of Iranian society.

However, considering the high participation rate and the attempt to send the questionnaire to a wide range of people, the present study seems to provide useful information in this area. It is therefore suggested that further studies be conducted in this area. The lack of appropriate indigenous instruments to measure these variables due to the novelty of the disease was another limitation that can be mentioned. Moreover, the present instrument was evaluated and validated among Persian speakers only, while translating this tool to other languages and societies and cultures can help to better assess and identify possible strengths and weaknesses.

Conclusion

HL had a positive relationship with self-care behaviors in the prevention of COVID-19 which requires further research and provides an incentive to develop and test special educational interventions at the HL level to improve self-care in the prevention of COVID-19.

Acknowledgments

This article is the result of a research project with code 990486 and ethics code IR.MUMS.REC.1400.255 approved by Mashhad University of Medical Sciences. It is necessary to thank and appreciate the participants of the study and the loved ones who have contributed greatly to the implementation of this project.

The authors also thank Mashhad University of Medical Sciences for its financial support for this study.

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