

The Relationship between Health Literacy and Covid-19 Preventive Behaviors in Healthcare Workers in Sistan and Baluchistan Province, Southeast Iran

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Abstract

Background: Health literacy and preventive behaviors can be considered important factors in healthcare workers' decisions and how they function in the health system to promote the health of society. Therefore, the present study determined the relationship between health literacy and Covid-19 preventive behaviors among healthcare workers in Sistan and Baluchistan province, southeast Iran.

Methods: This descriptive-analytical (cross-sectional) study was conducted on 300 healthcare workers in Sistan and Baluchistan province in 2021. Samples were collected by convenience method through social media. Data were collected electronically using the Health Literacy and Covid-19 preventive behaviors questionnaire. Data were analyzed by frequency, mean, Pearson correlation coefficient, and linear regression.

Results: Only 24.4% of healthcare workers had sufficient health literacy. The healthcare workers' health literacy mean score was 58.39 ± 8.57 out of 88. Also, the score of health literacy in the dimension of access was 16.38 ± 3.45 , in the dimension of understanding was 17.06 ± 3.74 , in the dimension of appraisal was 14.28 ± 3.40 , and in the dimension of the use of health information was 13.74 ± 2.93 . The mean score of preventive behaviors was 30.54 ± 6.16 out of 48. A positive and significant relationship was observed between health literacy and preventive behaviors. Demographic variables predicted 29% of the variance of Covid-19 preventive behaviors, with health literacy being the strongest predictor ($\beta=0.225$).

Conclusion: The results of this study confirmed the predictive role of health literacy in Covid-19 preventive behaviors. Also, poor and borderline health literacy concerning Covid-19 was a common problem among healthcare workers in Sistan and Baluchistan province, so it reduced the probability of performing Covid-19 preventive behaviors. Therefore, it is essential to design and implement interventions to improve the health literacy of healthcare workers.

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Introduction

In late December 2019, a new coronavirus, called New Coronavirus-2019 (SARS-CoV-2), triggered the spread of pneumonia from Wuhan (Hanan Seafood Market) throughout China, which now poses a major threat to public health all around the world. Early symptoms of Covid-19 include; pneumonia, fever, muscle aches, and fatigue. The covid-19 pandemic caused by the new coronavirus-2019 is spreading throughout the world.¹ Unfortunately, this virus has also infected our beloved country, Iran, like other countries in the world, and the fight against this virus is being carried out comprehensively throughout the country. Although this virus is a new coronavirus and there is limited information on SARS and the pathogenicity of the virus as well as methods of control and treatment of this disease, currently, the most important method of dealing with this virus is to prevent its spread.² Health centers are the most important places where employees spend long hours dealing with many people regularly. Therefore, the World Health Organization and the Center for Disease Control and Prevention, have suggested measures such as; regular disinfection of surfaces and equipment, regular and thorough hand washing, promotion of respiratory health, regular coughing, encouraging telecommuting as a way to maintain employees' health, and preserving local restrictions on traveling and attending large gatherings to ensure the safety of the workplace and reduce the risks to employees.³

Measures such as training, improving awareness, changing attitudes, and taking preventive action to protect against Covid-19 are important Covid-19 prevention strategies.⁴ Health literacy puts an end to the confusion in the health field. Health literacy is related to the vital issues that improve the country's health and health policies, so having high health literacy is one of the requirements of today's healthcare system.⁵ Health literacy may play an important role in maintaining a high adherence to infection-prevention behaviors and should be considered the implementation of public health interventions in pandemic times.^{6, 7} The experience during the COVID-19 pandemic has shown that health literacy plays a key role in preventing and controlling diseases and pandemics.⁸ Healthcare workers are among professionals who work exclusively with the public as a service link between service consumers and providers to promote health among groups that do not have adequate access to health care,⁹ they are among influential people who can promote preventive behaviors.¹⁰ Also, since health literacy is the most important issue in Covid-19 preventive behaviors, it is necessary to promote preventive behaviors in employees at risk of Covid-19 disease. Therefore, this study was conducted to determine the relationship between health literacy and Covid-19 preventive behaviors among healthcare

workers in Sistan and Baluchestan province in the southeast of Iran.

Methods

This descriptive-analytical (cross-sectional) study was conducted on the healthcare workers in Sistan and Baluchistan province in 2021. The study population consisted of all health system employees in Sistan and Baluchistan province. Inclusion criteria were: working in the health centers such as city health centers, comprehensive urban and rural health centers, health houses or health centers, having one year of work experience, and willingness to complete the questionnaire. Exclusion criteria included: not completing the questionnaire or partial completion of the questionnaires. The sample size was calculated to be 170 people, taking into account the statistical reliability of 95% ($\alpha=2$ and $\alpha=0.05$), $P=30\%$, and accuracy of 7% ($d=0.07$), using the following formula:

$$n = \frac{Z_{1-\alpha/2}^2 \times p \times (1-p)}{d^2}$$

However, to increase the reliability of the results and to take into account the possibility of a 10% sample drop, 300 people were considered for the study (according to the results of the pilot study, the level of sufficient health literacy in Sistan and Baluchistan province was about 30% and the P value was considered at 0.3).

The convenience sampling method was used in this study by sending the link of questionnaires to healthcare workers in different cities of Sistan and Baluchistan province through social networks, such as Telegram, WhatsApp, Facebook, and Twitter.

Measurements

The data collection tool included a researcher-made questionnaire consisting of three parts; demographic characteristics, Covid-19 preventive behaviors, and Covid-19 health literacy.

Demographic Characteristics Questionnaire

This questionnaire was used to determine the demographic variables such as gender (male, female), age (year), marital status (single, married), level of education (diploma, associate diploma, bachelor, master, doctorate), economic status (good, average, bad), health status (excellent, good, average, bad), place of residence (city, village), and vaccination (yes, no).

Preventive Behaviors Questionnaire

The authors designed this questionnaire based on the preventive instructions provided by Iran's Ministry of Health and the World Health Organization.¹¹

This questionnaire had 12 questions, including wearing gloves, wearing a mask, hand disinfecting with alcohol, surface disinfection, frequent hand washing with soap and water, observing appropriate social distancing, avoiding handshake and greeting kisses with others, not participating in gatherings, using a shield, etc. The answer to these questions was in the form of yes (score 1) and no (score zero). The score range of this questionnaire varied from 0 to 12, with higher scores indicating better preventive behavior. To determine the face and content validity, the authors presented the questionnaire to a panel of experts, including ten relevant experts (health education, epidemiology, and infectious disease specialists), and applied their opinions to modify the questionnaire. The reliability of this questionnaire was calculated by internal consistency and Cronbach's alpha coefficient (0.92).

Covid-19 Health Literacy Questionnaire

The Covid-19 health literacy questionnaire had 22 questions in four dimensions of access (6 questions), understanding (6 questions), appraisal (5 questions), and use of information and health services (5 questions). The answer to these questions was based on a five-point Likert scale, ranging from very easy (score 4), easy (score 3), difficult (score 2) to very difficult (score 1). The score range in this questionnaire varied from 22 to 88, so a score of 50 or below was considered insufficient health literacy, a score of higher than 50 and less than 60 was considered borderline health literacy, and a score of 60 or above was considered sufficient health literacy. To determine the face and content validity, the authors presented the questionnaire to a panel of experts, including ten relevant experts (health education, epidemiology, and infectious disease specialists) and applied their opinions to modify the questionnaire. The reliability of this questionnaire was calculated by internal consistency and Cronbach's alpha coefficient (0.94).

Initial explanations, such as the study's objectives, the inclusion criteria for the participants, and the ethics code, were written at the top of the questionnaires, and the participants were assured that their personal information would be kept confidential and anonymous. The participants could access the questions page by clicking on the "agree" button. The link of electronic questionnaires used in this study was sent to the healthcare workers in Sistan and Baluchestan province through various social networks so that those who

meet the inclusion criteria can complete them.

Data were analyzed by statistical tests such as frequency, mean and standard deviation, linear regression, independent t-test, and one-way ANOVA. The authors used Pearson correlation coefficient through SPSS software version 21 to determine the relationship between quantitative variables. The significance level of 0.05 was considered for all tests. The Kolmogorov-Smirnov normality test was used to evaluate the normality of the scores. The Research Ethics Committee of Zahedan University of Medical Sciences issued the ethics code of the study: IR.ZAUMS.REC.1400.007.

Results

In total, the data of 300 healthcare workers were analyzed. The mean and standard deviation of the age of healthcare workers was 34.26 ± 1.26 . Also, 38% of the participants were women, 62% were men, and 61% were married (183 people). Among the participants, 53% were in good health, and 51.66% had a bachelor's degree. The health literacy of 24.4% of healthcare workers was sufficient, 62.7% was borderline (moderate), and 12.9% was insufficient. The health literacy mean score of healthcare workers was 58.39 ± 8.57 out of 88 (Table 1). Also, in terms of the dimensions of health literacy, the findings showed that the mean score of health literacy was 16.38 ± 3.45 in the dimension of access, 17.06 ± 3.40 in the dimension of understanding, 14.28 ± 3.40 in the dimension of appraisal, and 13.74 ± 2.93 in the dimension of use of health information.

The independent t-test and one-way ANOVA results showed no significant relationship between health literacy and individual variables of marital status, gender, health status, education level, place of residence, and preventive behaviors ($P \geq 0.05$). The results also showed that most participants (58.7%) had a moderate level of health literacy, 36.3% had a sufficient level of health literacy, and 3% had an insufficient level of health literacy. Also, the mean score of preventive behaviors was 30.54 ± 6.16 out of 48. Concerning preventive behaviors, most of the employees were performing behaviors such as; avoiding greeting kisses and handshaking with others, using masks, frequent hand washing with soap and water, keeping a proper distance from others, and hand disinfecting with alcohol, respectively. Fewer healthcare workers used shields, surface disinfection, and gloves (Table 2).

Table 1: Assessment of health literacy and its dimensions in health workers

Dimension of health literacy	Mean and standard deviation
Access	16.38 ± 3.45
Understanding	17.06 ± 3.40
Appraisal	14.28 ± 3.40
Use of health information	13.74 ± 2.93
Overall score	58.39 ± 8.57

Table 2: Classification of health literacy score of the studied samples based on demographic variables

Variable		Frequency	Percentage Frequency (%)	Insufficient health literacy Frequency (%)	Borderline health literacy Frequency (%)	Adequate health literacy	Significant level
Gender	Man	186	62	27 (14.51)	114 (61.29)	45 (24.19)	0.98
	Woman	114	38	17 (14.91)	72 (63.15)	24 (21.92)	
Marital status	Single	117	39	14 (11.96)	70 (59.82)	33 (28.20)	0.41
	Married	183	61	50 (27.32)	86 (46.99)	47 (25.68)	
Health status	Bad	5	1.66	0 (0)	2 (40)	3 (60)	0.33
	Moderate	42	14	11 (26.19)	21 (50)	10 (23.80)	
	Good	159	53	17 (10.69)	107 (67.29)	35 (22.01)	
Level of education	Excellent	94	31.33	15 (15.95)	55 (59.51)	24 (25.53)	0.07
	Diploma	50	16.66	6 (12)	26 (52)	18 (36)	
	Associate diploma	61	20.33	5 (8.19)	48 (78.68)	8 (13.11)	
	Bachelor's degree	155	51.66	23 (14.83)	99 (63.87)	33 (21.29)	
Place of residence	Master's degree	34	11.33	10 (29.41)	11 (32.35)	13 (38.23)	0.58
	City	249	83	31 (12.44)	160 (64.25)	58 (23.29)	
Vaccination	Village	51	17	9 (17.64)	27 (52.94)	15 (29.41)	0.57
	Yes	203	67.66	26 (12.80)	130 (64.03)	47 (23.15)	
	No	97	32.33	16 (16.49)	55 (56.70)	26 (26.80)	

The matrix of Pearson correlation showed a significant relationship between preventive behaviors and health literacy so people with higher education had higher preventive behaviors (Table 3).

Multivariate regression analysis was used to evaluate the predictive rate of Covid-19 preventive behaviors by health literacy and other variables. The studied variables predicted about 29% of the variance of Covid-19 preventive behavior. In addition, the predictive power of health literacy was higher for preventive behavior (Table 4).

Discussion

This study showed a statistically significant and positive relationship between health literacy and preventive behaviors. Hence, people with higher health literacy had higher preventive behavior. Health literacy was also the

strongest construct in predicting Covid-19 preventive behaviors. Chang's study showed that adolescents with low health literacy had low health-promoting behaviors.¹² Aghaee also showed that 49% of changes in health-promoting behaviors are explained by health literacy.¹³ Gurkan revealed a significant relationship between health literacy and health-promoting behaviors.¹⁴ The results of these studies are consistent with the present study's findings, so healthcare workers with high health literacy performed more preventive behaviors than those with low health literacy. Therefore, it is necessary to provide health information for healthcare workers by using different communication channels. Also, the advantages and limitations of preventive behaviors should be communicated to healthcare workers to enable them to evaluate issues and make informed decisions.

The present study showed that most healthcare workers had moderate levels of health literacy. The

Table 3: The relationship between health literacy and Covid-19 preventive behaviors in healthcare workers

Variable	Health literacy	
	Pearson correlation coefficient	Significant level
Preventive behaviors	0.228	0.000

Table 4: Results of linear regression coefficient to predict Covid-19 preventive behaviors

Variable	Covid-19 preventive behaviors			
	Standard Beta Coefficient	t test	P value	Adjusted R Square
Constant	-----	7.072	<0.001	
Health literacy	0.225	3.052	0.002	0.285
Economic status	-0.028	-0.428	0.669	
Age	-0.078	-0.949	0.344	
Gender	0.033	0.505	0.614	
Health status	0.047	0.725	0.469	
Income level	-0.028	-0.428	0.669	
Education level	0.031	0.501	0.188	
Vaccination	0.087	1.205	0.230	
Work experience	0.078	0.910	0.364	
Marital status	-0.099	-1.320	0.188	

results of a study by Esfahroudi et al. revealed that health literacy in 59.3% of diabetic patients referred to the Diabetes Research Center was insufficient, 18.5% of them were borderline, and only 22.2% of the patients had a sufficient level of health literacy.¹⁵ Also, the results of Nekooyemoghaddam's study showed that most of the participants had insufficient or borderline health literacy.¹⁶ The results of another study by Khosravi et al. revealed that participants' health literacy was at a borderline level with an average of 66.¹⁷ Our results also showed no significant relationship between health literacy and gender, which is consistent with the findings of Bavandpour et al. and Charoughchian's studies.^{18, 19} They also showed no significant relationship between health literacy and level of education, which is in line with Harsch's study that evaluated the health literacy of support workers in health houses.⁵ However, some studies have shown a significant relationship between health literacy and education level, indicating that people with higher education have higher health literacy, which is consistent with the present study.¹⁷⁻²⁰ It seems that this discrepancy can be due to differences in health literacy assessment tools as well as cultural and social differences in the two communities because in addition to using the specific Covid-19 health literacy assessment tool, with the onset of the Covid-19 epidemic, all members of society have been equally educated about covid-19 prevention through virtual space, radio, television and health centers. This event can affect the health literacy of people in the society and eliminate the role of education level. The results also showed that the scores of Covid-19 preventive behaviors were at a moderate level among the healthcare workers. The results of Kim et al.'s study showed that the participants' mean score of health-promoting behavior was 50.2, which indicated a moderate level of health literacy.²¹ In the study of Mousavian et al., the mean score of health-promoting behaviors was at a moderate level.²² In the study of Kaboodi anet al, the mean score of health-promoting behaviors was also at a moderate level, which is consistent with the results of the present study.²³ In relation to the preventive behaviors, most of the employees were performing behaviors such as; avoiding greeting kisses and handshaking with others, using masks, frequent hand washing with soap and water, keeping a proper distance from others, and hand disinfecting with alcohol, respectively.

Also, a smaller percentage of health care performed preventive behaviors such as using shields, surface disinfection, and warning gloves. Public centers are one of the busiest places, where employees spend long hours dealing with many people regularly. Therefore, the World Health Organization and the Center for Disease Control and Prevention, to ensure the safety of workplace and reduce the risk of employees, have suggested measures, such as regular disinfection of

surfaces and equipment, regular and thorough hand washing, promotion of respiratory health, regular coughing, encouraging telecommuting to maintain employees' health, and preserving local restrictions on traveling and attending large gatherings.³ In the present study, preventive behaviors such as disinfection of surfaces and use of gloves by staff were observed less than other behaviors. Sadeghi states that one of the ways to transmit Covid-19 is by hand contact with the environment and virus-infected surfaces such as equipment, door handles, tables and chairs, taps, handrails, sockets, electrical switches, and all devices that are commonly used.²⁴ Therefore, hands and surfaces must be disinfected. This issue also shows the importance of surface disinfection to prevent Covid-19. Since limited health literacy can prevent the correct understanding of health advice and performing preventive behaviors, we should rely not only on education but also on removing existing barriers. This finding is very crucial for healthcare officials, policymakers, and providers. One of the strengths of the present study is the use of indigenous and specific tools to assess Covid-19 health literacy, which is consistent with the cultural and social characteristics of the study population. The limitations of this tool include its self-reporting method for answering the questions and the use of a native questionnaire, which makes it difficult to compare the differences between the people under study and other research communities.

Research Suggestions

- 1- Investigating the economic burden of limited health literacy, especially regarding the consequences of infectious diseases such as Covid-19
- 2- Carrying out a qualitative study on the root cause of low Covid-19 preventive behaviors
- 3- The relationship between health literacy and Covid-19 preventive behaviors in other regions and even at the national level to improve health literacy of individuals in the community.

Conclusion

The results of this study confirmed the predictive role of health literacy in Covid-19 preventive behaviors. Also, insufficient and borderline health literacy regarding Covid-19 was a common problem among healthcare workers in Sistan and Baluchistan province, so it decreased the possibility of performing preventive behaviors. Therefore, it is essential to design and implement interventions to improve the health literacy of healthcare workers.

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