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The Relation between Media Literacy and COVID-19 Vaccination

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Abstract

Background: Media literacy refers to a set of skills designed specially to help people make better health decisions while dealing with media tasks. The present study was conducted to investigate the relationship between media literacy and willingness to be vaccinated among medical students.

Methods: This is a descriptive cross-sectional study. The statistical population consisted of all students at Iran University of Medical Sciences, among whom, 389 samples were recruited. Two questionnaires were used: (1) Media Literacy and (2) Willingness to be Vaccinated. The validity of these questionnaires was confirmed by the content validity method and consultation with experts. Data were analyzed using Pearson correlation, *t* test, and one-way analysis of variance using SPSS v. 20 (SPSS Inc).

Results: The willingness to be vaccinated was higher in men (23.04 ± 5.59) than in women (21.07 ± 3.77) and this difference was significant (P<.001). However, there was no significant difference between willingness to be vaccinated and marital status, educational level, and age. The findings showed a significant relationship between media literacy and willingness to be vaccinated.

Conclusion: The effect of media literacy on retrieving and recognizing accurate information is one of the crucial results of the present study. This skill affects an individual's willingness to make the right decision on timely COVID-19 vaccination.

Keywords: Media literacy, COVID-19, Vaccine, Student

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Introduction

Media literacy has been relatively recently considered by the World Health Organization (WHO) as one of the top 5 literacy skills in the present age. According to the latest UNESCO's definition of literacy, media literacy is one of the 6 most important pieces of literature in the world today (1). It refers to the ability to access, analyze, evaluate, adopt critical thinking, and create messages in various forms (printed, audio, film/video, Internet, etc.) based on a mindful and critical understanding of the nature of mass media and as an interdisciplinary field, as a necessary response to the complex electronic, pervasive, and ever-changing environment (2). The concept of media literacy is the understanding and analysis of all concepts and content that we obtain from the media. To put it plainly, media literacy means thinking about and retrieving the right information and determining its accuracy and correctness for personal or collective use. While most of the information spread throughout the Web is shared and forwarded in social media, juveniles and adolescents must be aware of the dangers and potential harms of social media's

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↑What is "already known" in this topic:
The COVID-19 pandemic is accompanied by a lot of conflicting information about the COVID-19 vaccination on social media. The incorrect information and disability to identification of correct information led to the avoidance of the vaccine.

→What this article adds:
Due to abundance of disinformation spread throughout the web pages, the COVID-19 vaccination has been challenged. The media literacy has a direct impact on willingness to be vaccinated among medical students.

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disinformation. This reminds us of the necessity of obtaining media literacy for analysis of media messages and posts (3). Reviewing the results of previous studies indicates the effect of educational programs on media literacy to prevent high-risk behaviors and the need for health interventions to increase media literacy (4).

Cyberspace is a large community consists of millions of computers, tablets, and mobiles. In such an era, media appeal has affected the lives of many of adolescents and young people (1). Inaccuracy of the information delivered by the media has led to a chain of incorrect information spread mainly on the social media. This is more serious when it comes to health information and information that affects people's decisions. In the COVID-19 pandemic, this issue has become even more prominent. The presence of large amount of false, complex, and contradictory information, (i.e., disinformation) has increased anxiety and created uncertainty among people (5). The presence of disinformation especially in health domain obviously threatens the public health. As observed during the COVID-19 pandemic, disinformation has been widespread since the beginning of the pandemic. This causes the audience to have serious doubts about the accuracy of the health information and the statements given by health authorities regarding the information related to the COVID-19 (3).

The social media help rapid spread of information and disinformation on the Web (known as infodemic). Baines and Elliott maintain that different forms of disinformation are emerging daily, causing confusion among individuals for right information (4, 5). According to many research, disinformation is the leading cause of vaccination skepticism, vaccination delays, and vaccination refusal. To add the complexity of the situation, the negative information bias may cause catastrophic thinking and a positive information bias may result in unrealistic optimism; both may lead to inevitable consequences. This is a global scientific challenge (2).

A global survey of 19 countries indicated that doubts about the COVID-19 vaccine ranged from 11.4% in China to 45.1% in Russia (6). The link between disinformation and vaccination doubts has been well confirmed (7). According to the inoculation theory in psychology, the denial of previous information by the authorities weakens the information; thus, even with an effective vaccine against COVID-19, the willingness to be vaccinated will be susceptible to poor information (3). Unfortunately, the flood of antivaccination conspiracy theories circulating on social media has a negative impact on the community's health and students' educational approaches (8, 9). Fighting with the spread of disinformation is, thus, an essential step, and media literacy is unquestionably a crucial tool in this regard (2).

The proliferation of disinformation about the COVID-19 vaccine on social media alarms the need for media literacy skills. Media literacy is a relatively new approach to help people watch the content they ordinarily receive and consume. Various studies (7-9) indicated that people with limited media literacy are likely to be at risk for a range of serious health harms. No one can convince the media to provide healthier content for their audiences. Neither governments nor non-for-profit organizations can fully control the content of social media messages. Thus, acquiring media literacy skills is a clue and can relieve the situation much better.

College students are suffered from their institutions' immediate shift to distance learning. They spend more time on social media than they did prior to the COVID-19 pandemic, thus, faced with disinformation more than ever (4). As a result, college students, as well as ordinary people, require more than ever media literacy to assess information usefulness and validity, and wisely protect themselves from disinformation (9-12).

For current study we chose a sample of medical students at Iran University of Medical Sciences to find about the extent they are equipped with media literacy in the world today. We supposed that they, as the future medics, must be aware of the ways they acquire rightful information, encourage people to be vaccinated, and work to prevent vaccination avoidance. Thus, this study aimed to assess the level of medical students' media literacy and to investigate the relationship between their willingness to be vaccinated against COVID-19 and the media literacy components.

Methods

This is a descriptive cross-sectional study. Based on Morgan and Krejsie table, 389 medical students at Iran University of Medical Sciences were chosen and enrolled as study samples. Stratified random sampling was used so that each faculty was considered as 1 class and a total of 10 classes were selected. The samples were selected from each class proportionally (Table 1). In the present study the Falsafi et al (13) 5-point Likert type Media Literacy Questionnaire was used to assess the students' level of media literacy. This questionnaire consists of 20 questions for 5 dimensions including understanding media messages, awareness of hidden goals, mindful selection of media messages, critical thinking about media messages, and analysis of media messages. This questionnaire was used for the ease and speed of use, being normal for Iranian population, addressing major areas of media literacy in a few dimensions, and that the tool has been used in various studies so far, indicating its acceptable validity (14-17).

A researcher-made 5-point Likert type questionnaire was used to measure the participants' willingness to be

Table 1. Number of Participants Recruited from Iran University of Medical Sciences

College	N	College	N	College	N	College	N	College	N
Public Health	39	Management and Information Science	47	Rehabilitation	42	New Technologies	23	Nursing and Midwifery	43
Paramedical Sciences	54	Iranian Medicine	11	Medicine	84	Pharmacy	15	Behavioral Sciences	31

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vaccinated against COVID-19. The questionnaire was designed based on previous studies and reviewing the literature. The questionnaire has 10 questions in 2 dimensions, including type of vaccine (name of vaccine, its components, manufacturer, age-related factor, and clinical stages of vaccine development) and vaccine complications (immunity, carrier, side effects, COVID-19 infection, and secondary side-effects). To evaluate the validity of both questionnaires, the content and face validity were used. To evaluate the reliability of both questionnaires, 30 questions were distributed among similar students as a pilot. The Coronach's alpha was 0.863 for willingness to vaccination, and 0.912 for media literacy questionnaires. The data were collected online using social networks and email. At the beginning, the researchers provided participants with explanations regarding the study goals and reassured them that their information and answers would be kept confidential. All participants read and signed an informed consent form before involving in the research. To learn more about the individual characteristics of students, they were asked about their age, gender, educational level, marital status, and name of the faculty. The data obtained from these questionnaires were analyzed through SPSS v.20 (SPSS Inc). Using the Kolmogorov-Smirnov test, we found that the data sets for media literacy and willingness to be vaccinated and their dimensions follow a normal distribution. Accordingly, the data were analyzed using *t* test, analysis of variance (ANOVA) and the Pearson correlation coefficient.

Results

The present study was conducted to determine the relationship between media literacy and willingness to be vaccinated against COVID-19 among medical students at Iran University of Medical Sciences. Of 389 participants, 384 answered the questionnaires; 53% were men and 47% women, 69% were single and 31% married, 42% had a bachelor's degree or lower and 58% had a master's degree or higher. As many as 71% were younger than 30 years old and 29% were older than 30 years old.

The results found that men were more likely to be vaccinated than women and this difference was significant ($P< 0.001$). However, there was no significant difference between willingness to be vaccinated in terms of marital status, educational level, and age. Table 2 demonstrates the relationship between the variables of sex, age, education level, and marital status and one's willingness to be vaccinated against COVID-19.

According to the findings, there was a significant relationship between media literacy and willingness for vaccination. The relationships between the 5 media literacy skills and the 2 variables of vaccine type and complications of vaccine are shown in Table 3. Based on the findings, there was a significant relationship between the type and complications of vaccine and analysis of media messages and there was a significant relationship between complications of vaccine effects and the understanding the media messages. No significant relationship was observed between other media literacy skills and 2 dimensions of vaccine type and complications of the vaccine.

Overall, as shown in Table 4, there was a very low correlation between students' awareness of the hidden goals of the media message and willingness to be vaccinated. Moreover, there was a relatively low correlation between mindful selection of media messages and willingness to be vaccinated. There was also a moderate correlation be-

Table 2. The relationship between Age, Sex, Education, and Marital Status with Willingness to be Vaccinated

Variable		Number	Mean	SD	Test Statistics	*P*
Gender	Male	170	23.04	5.59	3.90	<0.001
	Female	201	21.07	3.77		
Marital status	Single	136	22.45	2.88	1.72	0.086
	Married	235	21.70	5.59		
Degree	Base	168	21.77	4.42	-0.748	0.455
	Master and higher	203	22.14	5.07		
Age	30<	204	22.27	5.09	1.33	0.184
	30>	167	31.61	4.38		

Table 3. Spearman correlation between Media Literacy and its dimensions with Vaccine Type and Vaccine Complication

Willingness to Be Vaccinated	Complications of Vaccine Spearman's rho (*P*)	Type of Vaccine Spearman's rho (*P*)
Media literacy and its dimensions		
Media literacy	0.415 (<0.001)	0.228 (<0.001)
Understanding media messages	0.161 (0.002)	0.030 (0.558)
Awareness of hidden goals	0.039 (0.425)	0.075 (0.149)
Mindful selection of media messages	0.101(0.055)	0.099 (0.26)
Critical thinking about media messages	0.223 (<0.001)	0.083 (0.11)
Analyzing media messages	0.24 (<0.001)	0.287 (<0.001)

Table 4. The relationship between Media Literacy dimensions and Willingness to be Vaccinated

Dimensions	Test Statistics	*P*	Spearman's rho (*P*)
Analyzing media messages	100.46	<0.001	0.257 (<0.001)
Critical thinking about the media messages	4.41	0.013	0.189 (<0.001)
Understanding media messages	0.818	0.414	0.128 (0.014)
Mindful selection of media messages	5.52	0.004	0.092 (0.081)
Awareness of hidden goals	0.338	0.714	0.023 (0.66)

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tween understanding media messages and willingness to be vaccinated, and a relatively good correlation between critical thinking about media messages and willingness to be vaccinated. Finally, there was a strong correlation ($P<$ 0.001) between analysis of media messages and willingness to be vaccinated.

Discussion

The COVID-19 pandemic has led to the rapid and widespread dissemination of valid and invalid information on the Web, especially social networks. The speed of information about COVID-19 vaccines has been overwhelmingly high, making it difficult and challenging for people to make the best decision about their health. At the meantime, determining the accuracy of received or available information requires media literacy skills (3-5). However, few studies have been conducted on the relationship between having these skills and the effects in making decisions in different areas of health (7-9). The present study aimed to investigate the relation between 5 dimensions of media literacy and medical students' willingness to be vaccinated against COVID-19.

The pervasiveness of the media and the emergent need to use them in the Covid-19 pandemic, has obligated people to receive more media messages. According to the results, media literacy of men was greater than that of women, indicating men are probably more sensitive about media messages and women are more affected by the media messages. This finding is in line with Nematifar et al (11), Ouedraogo (13), and Falsafi et al (18), and different from the findings of Ashrafirizi et al (19). There was no significant relationship between media literacy and education level, marital status, and age. Supposedly, as individuals grow older, they accumulate more experiences and presumably acquire more media literacy. However, the results showed no significance in this regard, which is not in line with the results of Nematifar et al (11) and Khodamradi (11, 20).

Regarding the relationship between the 5 dimensions of media literacy with vaccine type and vaccine complications, there was a direct and significant relationship between analysis of media messages and vaccine type and complications. This means that people's best ability to make an accurate understanding of vaccine news and vaccine complications is derived from their skills in analyzing media messages. However, since they were medical students, this may be due to their general knowledge of the vaccine. Moreover, students had a good skill in understanding media messages about vaccine complications. This can also influence their level of awareness toward vaccines in general. There was a positive significant relationship between media literacy and willingness to be vaccinated, i.e., people with higher media literacy levels are more likely to be vaccinated and less affected by the contradictory messages about COVID-19 vaccines. They are also less doubtful about being vaccinated.

Investigating the relationships between 5 dimensions of media literacy and one's willingness to be vaccinated showed that analysis of the media messages had the best correlation followed by critical thinking about media messages, understanding media messages, mindful selection of messages, and awareness of hidden goals. For the very low correlation between awareness of the hidden goals behind the media message and willingness to be vaccinated it can be said that students are unaware of the goals of some networks to impose their desired mindset and do not realize the fact that in some networks, even in the field of health and during the COVID-19 pandemic, political and cultural goals are superior to proper awareness of students. They were unable to understand that these networks may disseminate disinformation on COVID-19. They lack the skill to uncover the hidden goals of messages, and they will, thus, become victims of disinformation on COVID-19 vaccines.

There was a relatively low correlation between h selection of media messages and willingness to be vaccinated. This means that students had relatively little knowledge to differentiate between various types of messages. In fact, students are not able to accurately select their needed information, and, as a result, they are readily influenced by media propaganda on the COVID-19 vaccine.

There was a moderate correlation between understanding media messages and willingness to be vaccinated. It seems that they have a relatively good discriminative power about the content provided on social networks. The moderate correlation may be due to the fear and stress prevailing the world due to the unknown nature of the COVID-19 disease, its different mutations, the emergence of different types of this disease, the complexity of the COVID-19 vaccine, and a wealth of contradictory information about different types of vaccines.

There was a relatively good correlation between critical thinking about media message and willingness to be vaccinated. Having mastery over critical thinking makes it hard for media propaganda to have a serious effect on students' mindset. In this regard, it can be claimed that students are aware of the potential effects of social networks on themselves, and most of them know that these networks often seek to maintain and expand their own financial interests. People with critical thinking skills become suitably aware of the potential adverse effects of social networks on themselves.

There was a good correlation between analysis of media message and willingness to be vaccinated. This means that students make informed choices based on their analysis of media messages; this optimizes their professional activities and avoids confusion in the face of different types of media and their messages. These students will mindfully follow the programs, and less frequently become confused. This is noteworthy to say that the emphasis of society, has an impact on how people assess information provided in cyberspace.

In general, the students' skills in analysis of media messages, critical thinking, and understanding media messages was better than uncovering the hidden goals and the mindful selection of the media messages. Montagni et al (3) concluded that there was a direct relationship between health literacy skills and accepting the COVID-19 vaccine with the ability to detect fake news (3). The findings of their study are in line with those of the present study. In a

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study to accelerate health literacy during the COVID-19 pandemic, Brørs et al (21) investigated the barriers to acquire health literacy and concluded that health literacy skill is essential in COVID-19 pandemic, thus, should be a priority for countries (21). The results of the study conducted by Brørs et al are in line with those of the present study.

Fauzi et al (22) who investigated the level of COVID-19 information literacy among biology students in Indonesia, concluded that students were aware of the disease through social media before COVID-19 entered Indonesia, yet mostly had a wrong understanding of COVID-19. In addition, students' educational background had no significant effect on their information literacy. The results of their study indicated that there are still many students who have not been able to understand COVID-19 correctly (22). The results of Fauzi et al study is in line with those of the present study, though, the emphasis of the present study was on media literacy.

Bilotserkovets et al investigated the issue of promoting students' medial literacy skills in virtual classroom during COVID-19 lockdown. The findings of their study showed that media literacy will strengthen students' ability to communicate correctly on social media, find accurate information, and critically comprehend and interpret received information and successfully capable of using media technologies to solve their professional and nonprofessional problems (9). In fact, they used their media literacy skills to learn a language during the COVID-19 lockdown. The results of this study are in line with those of the present study.

Ashrafirizi et al (19) investigated the level of media and information literacy among students at Isfahan University of Medical Sciences based on the United Nations Educational, Scientific and Cultural Organization media and information literacy indicators. Their results indicated that the level of media literacy and information literacy of these students is above average and relatively desirable (19). The results of their study are in line with those of our research. However, in their study, both media literacy and information literacy were investigated, while only medial literacy has been examined in our research.

Rezadad et al (16) investigated the moderating effect of media literacy on family health level and emotional-behavioral problems of female adolescents in schools located in districts 1 and 3 of Tehran. They concluded that the greater the family's media literacy, the better the family's health; as a result, emotional-behavioral problems are reduced. Although the main result of their study is in line with the results of the present study, yet there are differences in the details. Based on their results, analysis of media message ranked the first, while in our research, this dimension is ranked the second (16).

Nematifar et al (11) measured the level of media literacy of Telegram users. In this study, they concluded that there is a significant relationship between media literacy level and gender, educational level, age, and field of study. They also found that the variables of educational level and Telegram usage are 2 variables that explain media literacy. The level of media literacy of users was reported to be moderate. The findings of their study are not in line with the results of the present study (11).

Among the limitations of the present study, one can refer to the unwillingness of individuals to participate in the study for the fear of disclosing their personal information. The researchers did their best to remove this limitation by reassuring the participants to keep the confidentiality of individuals' information and report the results via codes. Other limitations included slow internet speed and infrastructural problems for answering online questionnaires, which were beyond the control of the research team. The researchers did their best to conduct the required frequent follow-ups. Another limitation of the study was that it only assessed media literacy among medical students at one university due to the unique COVID-19 settings and a lack of access to other students.

Conclusion

The effect of media literacy skills on distinguishing accurate news and information from inaccurate ones is one of the important results of this research. Media literacy is a complex phenomenon that calls for training. More research should be undertaken for different groups of society on a larger scale to identify the media literacy effect size, and to identify other related variables.

Conflict of Interests

The authors declare that they have no competing interests.

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