RESEARCH

Determination of the Relationship between Health Literacy and Attitudes towards COVID-19 Vaccine in Adult Individuals

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Abstract: Although it is known that the level of health literacy is effective in determining the direction of individuals' attitudes towards their own health, its effect on the attitudes towards COVID-19 vaccine is not yet known exactly. The aim of this study is to determine the relationship between health literacy and attitudes towards COVID-19 vaccine in adult individuals. This study is a cross-sectional design. The study was conducted with literate individuals aged 18 or over (N=210), in Turkey. The data were collected online using personal information form, Attitudes Towards COVID-19 Vaccine (ATV-COVID-19) Scale, and Health Literacy Scale (HLS). HLS score of the women and unemployed ones were high ($p<0.05$). ATV-COVID-19 scores of those with chronic diseases in their families were higher. ($p<0.05$). Moreover, scores of some subscales of HLS and ATV-COVID-19 were also correlated ($p<0.05$). It was determined that the adult individuals' health literacy and attitudes towards COVID-19 vaccine were positively correlated. It will be possible to reach higher community vaccination levels by planning activities that will increase health literacy throughout the society.

INTRODUCTION

Coronaviruses have been defined for decades and its various species have affected people's lives for years[1]. However, a new species that emerged in 2019 has affected the whole world with its high infectiousness and mortality rates[2]. The World Health Organisation (WHO) declared the novel variant of coronavirus disease-19 (COVID-19) caused by the virus as pandemic on March 11, 2020[3]. Since its emergence, approximately 180 million people have been infected with the disease and more than 4 million people have died[4]. The figures continue to increase day by day. Various treatment protocols have been published by health authorities in order to reduce the mortality and morbidity caused by the disease. Even though the negative effects of the disease are known to be likely reduced with effective treatment methods, there is no specific treatment option to be used in the treatment of COVID-19 today[5-7]. In this case, the only option left to humankind is to reduce the spreading rate of the disease till effective treatment options are developed. Numerous countries have tried to implement mask wearing, social distancing, lockdown, and quarantine measures in order to control the spread of the disease. Even though these measures seem to have been useful in reducing the spreading rate of the disease, they have adversely influenced countries and societies in economic and social aspects. A lot of people have lost their income and have become dependent on the helps of the states to maintain their lives[3]. Considering all these situations, various vaccine development studies have been carried out on the one hand, and some of these studies have been started to be applied on humans upon the approval of the WHO for their immediate use[8]. Both WHO and the health authorities of the countries suggest to reach high community vaccination rates in order to bring the pandemic under control[2,9]. WHO states that vaccination is the cheapest way to avoid many preventable diseases and has emphasised that the anti-vaccination is one of the 10 situations threatening global health[10]. However, there are various question marks about vaccines and this prevents vaccination studies from reaching the desired numbers. Numerous anti-vaccine groups have become organised and increase this confusion of people further[9].

As is known, vaccination activities have been implemented within the scope of preventive health services for many years. Vaccination has enabled to reduce mortality and morbidity rates associated with many diseases and eradicate some diseases, as well. Vaccine acceptance of individuals is considered as an important decision made by them concerning their own health. Many factors can be effective on the direction of this decision[11-13]. One of these factors is health literacy. It is a very broad concept that influences many results in health protection, health education, and communication activities. Health literacy includes cognitive and social skills that are effective in both promoting and

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maintaining health. It is known that health literacy is associated with accessing and understanding the accurate information related to health and using this information in one's own lives. Based on this information, it is thought that as individuals have a high level of health literacy, they would have a higher level of reaching the most accurate information about their own health as well as understanding and applying the information[14]. Despite this information in the literature, the number of studies investigating the relationship between health literacy and attitude towards COVID-19 vaccine in Turkey is limited. The aim of this study is to determine the relationship between the health literacy of adult individuals and their attitudes towards the COVID-19 vaccine. It is also aimed to determine the attitudes of the participants towards the COVID-19 vaccine and the individual characteristics influencing health literacy and contribute to the literature.

MATERIALS and METHODS

Setting and Sample

This descriptive and cross-sectional study was conducted with individuals living in Turkey between April and June 2021. The non-probability sampling method was used when determining the sample. In determining the sample size, the unknown prevalence was taken as 50% and the margin of error as 3% by using the Open Epi Calculator program and it was determined as 192 with an error level of 0.05 and a power of 50% (confidence level=%95). The inclusion criteria were determined as follows; being voluntary, being user of social media tools, being literate and aged 18 or over. Personal information form, Attitudes Towards COVID-19 Vaccine Scale, and Health Literacy Scale were used in the data collection stage of the study. Authors of all the scales were asked to give permission about their use. An access link was created by uploading all forms in "Google Forms" application. This link including the scales and the informed consent form was sent to the participants by using tools such as sms, e-mail and social media. The message about participation in the study was viewed by 215 people and 210 of them agreed to participate in the study and responded the surveys (responsiveness rate 97.7%). Each individual participating in the study was asked to send the participation message to people around their circle so that the targeted sample group was reached.

Data collection tools

Personal information form

This form was prepared by the researcher by reviewing the related literature. Information of the participants concerning age, gender, marital status, educational background, income status, employment status, and medical history of their own and their families was examined.

Attitudes Towards COVID-19 Vaccine Scale

This scale, which was developed by Geniş et al., has 9 items and two subscales (positive and negative attitudes). Items in the scale are rated as "Strongly disagree (1)", "Disagree (2)", "Neutral (3)", "Agreeing (4)", and "Strongly disagree (5)". High scores obtained from positive attitude subscale signify positive attitude towards the vaccine. Items in negative attitude subscale are calculated reversely and high scores in this subscale signify less negative attitude towards the vaccine. Cronbach's alpha value was found to be 0.80[1]. In this study, Cronbach's alpha value of the scale was found to be 0.88.

Health Literacy Scale

Health Literacy Scale has 25 items and four subscales (access, understand, appraise, and apply) for information relevant to health. Minimum and maximum scores of the scale are 25 and 125. The scale items are rated by the participants with Likert-type scale ranging from "Having no difficulty (5)", "Having little difficulty (4)", "Having slight difficulty (3)", "Having more difficulty (2)", "Unable to do/ having no ability/ impossible (1)". Higher scores from the scale and its subscales signify that health literacy level also increases. Cronbach's alpha value was found to be 0.92[15]. In this study, Cronbach's alpha value of the scale was found to be 0.90.

Data Analysis

The data were investigated using IBM SPSS Statistic 20.0 program. Frequency, percentage, mean, and standard deviation were used as the descriptive statistics. Shapiro-Wilk test was used in control normal distribution of continuous variables. While independent samples t-test was used to compare two independent groups having normal distribution, one-way ANOVA test was used to compare three independent groups having normal distribution. Pearson's correlation test was used to determine the correlation between numerical variables. Statistical significance level was accepted as $p< 0.05$.

Ethical considerations

Permission of Minister of Health for the studies on COVID-19 in Turkey is obligatory. Therefore, first, permission from scientific researches platform of Minister of Health was obtained. Furthermore, written approval from an University Ethics Committee and consent from the participants in online environment were obtained in order to conduct the study.

Limitations

The data of the study were collected online. Since young people are more eager to participate in online surveys, mean age of the participants in the study was low. The most important limitation of this study is that different age groups could not be homogeneously examined. Majority of the participants were university graduates; therefore, the obtained results cannot be generalised to the society.

RESULTS

The findings related to descriptive characteristics of the participants

When examining socio-demographic characteristics of the participants were examined, it was determined that majority of them were female, were single, graduated from higher education, had an income equal to their expenses, were unemployed, had no chronic disease and regular drug use in their own life or their family, and was exposed to no medical error. Also, mean age of the participants was 25.32±8.15 and their number of hospital admissions in the last 1 year was 4.20±4.73 (Table 1).

The findings related to HLS and ATV-COVID-19 scores of the participants

When examining HLS scores, it was determined that access, understand, apply, and total scores were higher in women than men (respectively; t=3.139, p=0.002; t=3.499, p=0.001; t=2.450, p=0.015; t=2.781, p=0.006). Moreover, understand, apply, and total scores were higher in unemployed ones than employed participants (respectively; t=-3.038, p=0.003; t=-2.604, p=0.010; t=-2.300, p=0.022) (Table 2).

When examining ATV-COVID-19 scores, it was found that the participants having chronic disease in their family had higher positive attitude, negative attitude and total scores (respectively; t=2.481, p=0.014; t=2.043, p=0.042; t=2.546, p=0.012) (Table 3).

Table 1. Socio-demographic characteristics of participants

		n	%
Age (Mean±SD)		210	25.32±8.15
Gender	Women	146	69.5
	Men	64	30.5
Marital status	Married	59	28.1
	Single	151	71.9
Educational status	Literate-Primary-Secondary School	4	1.9
	High school	23	11.0
	Higher education	183	87.1
Income status	Less than my expenses	79	37.6
	Equal to my expenses	96	45.7
	Higher than my expense	35	16.7
Employment status	Working	62	29.5
	Not working	148	70.5
Chronic disease	Yes	37	17.6
	No	173	82.4
Regular drug use	Yes	30	14.3
	No	180	85.7
Chronic disease in their family	Yes	86	41.0
	No	124	59.0
Exposure to medical error	Yes	22	10.5
	No	188	89.5
Number of hospital admissions in the last 1 year (Mean±SD)		210	4.20±4.73

The findings on the relationship between the participants' ATV-COVID-19 and HLS scores

When examining the relationship between the scale scores, it was observed that there was a relationship between the participants' apply and negative attitude subscales (r=0.163, p=0.09) (Table 4).

DISCUSSION

It is known that the low level of health literacy is one of the barriers to accessing preventive health services and implementing health protective practices. Also in order for vaccination, which is one of the preventive health services, to be beneficial in the most effective way, high community vaccination rates must be achieved[16]. In this study, it was determined that the participants' health literacy and attitudes towards COVID-19 vaccines were at a high level. In a study conducted by the Ministry of Health in Turkey, it was found that the health literacy level of 68.9% of the participants was insufficient or problematic[17]. It is thought that the differences in the results between the studies are caused by the differences in the individual characteristics of the participants. This may have been associated with the fact that the majority of the individuals participating in the study graduated from higher education. It is known that individuals with low education level have a low level of the participation in online surveys[18]. However, despite all these limitations, the prevention of face-to-face contact in pandemic conditions and the rapid collection of data have made the use of online surveys widespread[19].

Many factors influencing the level of health literacy have been identified. In the study, it was determined that level of health literacy of the women and unemployed ones was higher. Women are known to have better abilities in doing research about their own health and assess treatment options[20]. Higher level of health literacy of the women can be explained with this information. Some studies have reported that health literacy level of employed ones may be higher. However, the mean age of the participants in those studies was frequently at middle age level[21-23]. When the results of the present study were compared with those studies, it was observed that the participants in the present study were younger (25.32±8.15 years). We think that less participation of young participants in business life was effective in these results.

It is known that individuals suffering from chronic disease have higher rates of mortality and encountering with negative conditions depending on infection. It has been reported that vaccination studies may prevent such negative conditions[24,25]. When ATV-COVID-19 scores of the participants in the present study were compared, it was found that the vaccine attitudes of those having individuals with chronic disease in their family were more positive. This is thought to be related to health protection behaviour of family members of the participants.

When analysing HLS and ATV-COVID-19 scores, it was determined that there was a relationship between negative attitude and apply subscales. The increase in negative attitude score indicates the decrease in negative attitude related to the vaccine. The apply subscale refers to the ability to use information to protect and improve health[14]. In their study, Montagni et al.[26] reported that low health literacy was correlated with anti-vaccination. In the light of this information, it is seen that higher level of health literacy is associated with improvement in attitude toward vaccine.

Limitations

The data of the study were collected online. Since young people are more eager to participate in online surveys, mean age of the participants in the study was low. The most important limitation of this study is that different age groups could not be homogeneously examined. Majority of the participants were university graduates; therefore, the obtained results cannot be generalised to the society.

Conclusion

As a result of the study, it was determined that the participants' health literacy and attitudes towards COVID-19 vaccines were at a high level. The data of the study indicated that the health literacy level of female and unemployed ones was higher, and the vaccine attitudes of those having a family member with chronic disease were more positive. Based on the HLS and ATV-COVID-19 scores, it was determined that there was a relationship between negative attitude and apply subscales.

In the light of this information, it was observed that the increase in health literacy level was associated with improvement in vaccine attitude. Accordingly, it is recommended to increase the right decision -making skills of individuals concerning their own health by planning activities that will increase health literacy throughout the society. It is considered that vaccine attitude can be improved by means of activities to be planned especially for groups with a lower level of health literacy (such as men, the elderly, and individuals with low education level). Thus, it will be possible to reach higher community vaccination levels.

Conflict of interest

The authors declare that there are no conflict of interests.

Financial disclosure

This study did not receive funding.

Table 2. Comparison of HLS and subscale scores of the participants

		Access		Understand		Appraise		Apply		Total	
		Mean±SD	Statistic	Mean±SD	Statistic	Mean±SD	Statistic	Mean±SD	Statistic	Mean±SD	Statistic
Gender	Women	22.85±2.24	t=3.139 p=0.002	31.90±2.77	t=3.499 p=0.001	35.90±3.64	t=0.656 p=0.513	22.10±2.59	t=2.450 p=0.015	112.74±8.81	t=2.781 p=0.006
	Men	21.66±3.11		30.25±3.85		35.48±5.27		21.02±3.62		108.41±13.35	
Marital status	Married	22.63±2.98	t=0.494 p=0.622	30.93±3.54	t=-1.303 p=0.194	36.15±4.50	t=0.822 p=0.412	21.29±3.32	t=-1.460 p=0.146	111.00±11.90	t=-0.359 p=0.720
	Single	22.43±2.43		31.58±3.08		35.62±4.08		21.95±2.82		111.58±10.03	
Educational status	Literate-Primary-Secondary School	23.00±2.45	F=0.271 p=0.763	32.25±1.71	F=1.925 p=0.149	35.75±3.30	F=0.034 p=0.967	21.00±2.94	F=0.139 p=0.871	112.00±9.09	F=0.133 p=0.875
	High school	22.78±2.63		30.17±3.27		35.57±5.37		21.83±2.79		110.35±10.44	
	Higher education	22.44±2.60		31.53±3.22		35.80±4.07		21.78±3.01		111.54±10.65	
Income status	Less than my expenses	22.42±2.56	F=0.606 p=0.547	31.11±3.36	F=0.646 p=0.525	35.15±4.79	F=1.429 p=0.242	21.86±2.87	F=0.241 p=0.786	110.54±10.93	F=0.601 p=0.549
	Equal to my expenses	22.68±2.62		31.69±3.02		36.11±3.75		21.80±3.07		112.28±10.10	
	Higher than my expenses	22.11±2.60		31.23±3.46		36.23±3.86		21.46±3.02		111.03±11.08	
Employment status	Working	22.16±3.15	t=-1.096 p=0.276	30.37±3.85	t=-3.038 p=0.003	35.37±5.25	t=-0.735 p=0.464	20.95±3.52	t=-2.604 p=0.010	108.85±13.47	t=-2.300 p=0.022
	Not working	22.62±2.31		31.82±2.83		35.94±3.67		22.11±2.66		112.49±8.91	
Chronic disease	Yes	22.95±2.61	t=1.210 p=0.228	31.65±2.77	t=0.562 p=0.574	36.35±3.95	t=0.911 p=0.363	21.57±2.62	t=-0.466 p=0.642	112.51±9.43	t=0.697 p=0.487
	No	22.39±2.58		31.34±3.32		35.65±4.25		21.81±3.05		111.18±10.80	
Regular drug use	Yes	22.90±2.54	t=0.962 p=0.337	32.20±2.34	t=1.515 p=0.131	36.47±3.26	t=0.967 p=0.335	21.43±2.58	t=-0.678 p=0.499	113.00±7.68	t=0.888 p=0.376
	No	22.42±2.60		31.26±3.33		35.66±4.33		21.82±3.04		111.16±10.96	
Chronic disease in their family	Yes	22.57±2.53	t=0.343 p=0.732	31.23±3.09	t=-0.704 p=0.482	35.60±3.72	t=-0.444 p=0.657	21.36±2.82	t=-1.607 p=0.110	110.77±9.64	t=-0.757 p=0.450
	No	22.43±2.64		31.51±3.32		35.89±4.51		22.05±3.06		111.87±11.17	
Exposure to medical error	Yes	21.77±3.09	t=-1.352 p=0.178	30.55±3.97	t=-1.283 p=0.201	34.73±5.20	t=-1.024 p=0.316	20.91±3.05	t=-1.444 p=0.150	107.95±12.29	t=-1.626 p=0.106
	No	22.57±2.52		31.49±3.12		35.89±4.06		21.87±2.96		111.82±10.30	

Abbreviation: HLS, Health literacy scale

Table 3. Comparison of ATV-COVID-19 and subscale scores of the participants

		Positive attitude		Negative attitude		Total	
		Mean±SD	Statistic	Mean±SD	Statistic	Mean±SD	Statistic
Gender	Women	3.47±1.00	t=0.519 p=0.604	3.30±0.78	t=-0.053 p=0.958	3.38±0.77	t=0.327 p=0.744
	Men	3.40±1.12		3.29±0.82		3.34±0.88	
Marital status	Married	3.60±1.11	t=1.283 p=0.201	3.36±0.80	t=0.704 p=0.482	3.47±0.85	t=1.122 p=0.263
	Single	3.39±1.01		3.27±0.78		3.32±0.78	
Educational status	Literate-Primary-Secondary School	3.31±0.85	F=0.036 p=0.965	3.40±0.16	F=1.539 p=0.217	3.36±0.45	F=0.434 p=0.649
	High school	3.46±0.94		3.03±0.69		3.22±0.56	
	Higher education	3.45±1.06		3.33±0.80		3.38±0.84	
Income status	Less than my expenses	3.39±0.91	F=0.374 p=0.688	3.33±0.74	F=0.621 p=0.538	3.36±0.70	F=0.360 p=0.698
	Equal to my expenses	3.46±1.04		3.23±0.77		3.33±0.78	
	Higher than my expenses	3.57±1.30		3.38±0.94		3.47±1.07	
Employment status	Working	3.54±1.08	t=0.881 p=0.379	3.33±0.85	t=0.522 p=0.602	3.43±0.86	t=0.710 p=0.479
	Not working	3.41±1.02		3.28±0.76		3.34±0.78	
Chronic disease	Yes	3.42±1.07	t=-0.206 p=0.837	3.26±0.88	t=-0.308 p=0.758	3.33±0.85	t=-0.286 p=0.775
	No	3.46±1.04		3.30±0.77		3.37±0.79	
Regular drug use	Yes	3.39±1.01	t=-0.337 p=0.737	3.27±0.88	t=-0.168 p=0.867	3.33±0.82	t=-0.285 p=0.776
	No	3.46±1.05		3.30±0.77		3.37±0.80	
Chronic disease in their family	Yes	3.66±0.97	t=2.481 p=0.014	3.43±0.79	t=2.043 p=0.042	3.53±0.78	t=2.546 p=0.012
	No	3.31±1.07		3.21±0.77		3.25±0.81	
Exposure to medical error	Yes	3.35±0.93	t=-0.470 p=0.639	3.29±0.75	t=-0.030 p=0.976	3.32±0.69	t=-0.286 p=0.775
	No	3.46±1.05		3.30±0.79		3.37±0.82	

Abbreviation: ATV-COVID-19, Attitudes towards COVID-19 vaccine

Tablo 4. The relationship between some numerical variables of the participants ATV-COVID-19 and HLS scores

			1	2	3	4	5	6	7	8
HLS	Access	r	1							
		p								
	Understand	r	0.491	1						
		p	0.000							
	Appraise	r	0.557	0.713	1					
		p	0.000	0.000						
	Apply	r	0.377	0.469	0.544	1				
		p	0.000	0.000	0.000					
	Total	r	0.723	0.841	0.905	0.734	1			
		p	0.000	0.000	0.000	0.000				
ATV-COVID-19 Scale	Positive attitude	r	-0.021	-0.074	-0.006	0.019	-0.025	1		
		p	0.380	0.142	0.466	0.392	0.360			
	Negative attitude	r	0.108	0.034	0.074	0.163	0.112	0.596	1	
		p	0.060	0.310	0.142	0.009	0.052	0.000		
	Total	r	0.046	-0.024	0.037	0.100	0.047	0.899	0.887	1
		p	0.252	0.365	0.297	0.075	0.250	0.000	0.000	

Pearson Correlation; N=210, Abbreviation: HLS, Health literacy scale; ATV-COVID-19, Attitudes towards COVID-19 vaccine

Ethical approval

Permission of Minister of Health for the studies on COVID-19 in Turkey is obligatory. Therefore, first, permission from scientific researches platform of Minister of Health was obtained (Document no: Uğur Doğan-2021-03-17T10_59_52). Furthermore, written approval from Kilis 7 Aralık University Ethics Committee (Approval no: 2021/11).

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