

Evaluation of Health Literacy and COVID-19 Knowledge Levels of Candidate Soldiers: A Cross-sectional Study from Ankara, Turkey

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ABSTRACT

Objective

COVID-19 awareness and adaptation to protective measures are related to Health Literacy (HL) levels, and people's COVID-19 knowledge and HL levels are thought to be effective in managing the pandemic. This study aimed to evaluate candidate soldiers' HL and COVID-19 knowledge levels in the Altındağ district of Ankara, Turkey.

Material and Methods

A questionnaire form containing socio-demographic characteristics, 16-item European HL Survey Questionnaire, and propositions about COVID-19 was applied to candidate soldiers who were referred for COVID-19 PCR sampling to the Altındağ District Health Directorate before enlistment between December 2021-April 2022.

Results and Discussion

The study was completed with 668 candidate soldiers, most of whom were young adults. HL level of 20.5% was inadequate. The frequency of those who had not been vaccinated against COVID-19 was 16.8%. The COVID-19 knowledge level of those vaccinated was higher ($p=0.002$). The propositions about COVID-19 symptoms and correct mask use were answered correctly at the highest rate in COVID-19 knowledge level questions. The COVID-19 knowledge level score was significantly higher in those with adequate HL levels, aged 25 and over, non-smokers, and who had university or higher education levels. There was a positive correlation between the COVID-19 knowledge level and HL levels ($r=0.108$; $p<0.001$).

Conclusion

This study reveals the determination of HL and COVID-19 knowledge levels of candidate soldiers and related factors and supports the necessity of proactive participation of individuals with immediate action plans to increase HL and COVID-19 knowledge levels in young adults.

Keywords

Awareness; COVID-19; Health Literacy; Knowledge; SARS-CoV-2; Young Adult

INTRODUCTION

Health literacy (HL) refers to the ability of an individual to acquire, comprehend, assess and use health-related information to protect, sustain and improve health, and improve the quality of life. HL provides acquiring the knowledge and skills to improve the health of society

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by delivering lifestyle changes for each individual. Understanding and applying the information given by health authorities is closely related to HL levels.¹⁻³

Inadequate HL has many negative outcomes on both the individual and the healthcare system, such as the adoption of an unhealthy lifestyle and risky behaviours, insufficient use of preventive health services, increase in the use of therapeutic health services, decrease in adherence to treatment, increase in hospitalisation rates and increase in the burden on the health system.^{1,3,4}

HL is mainly associated with non-communicable diseases management and patient empowerment, and its power in infectious diseases is underestimated. However, the development of HL is related to responding to the threat of infection, following scientific recommendations against conflicting information and infodemic, and thus participating in individual and social struggle in the management of the pandemic, in unprecedented situations that require rapid response, such as the COVID-19 pandemic.^{5,6} As a social vaccine, HL enables reducing the spread of COVID-19 and ensures the protection of the population's health due to the understanding and implementation of health information by individuals and society, taking appropriate decisions about health and taking necessary precautions.⁷ In addition, awareness of COVID-19 and adaptation to protective behaviours were reported as associated with HL levels.⁵

In this context, it is expected that people's health behaviours will be affected by their COVID-19 knowledge levels and HL levels during the pandemic. This study aimed to evaluate the HL and COVID-19 knowledge levels of candidate soldiers before enlistment.

MATERIALS AND METHODS:

Participants, sampling, and study setting

We conducted a cross-sectional study on candidate soldiers who were referred for "Primary screening (COVID-19 PCR sampling for enlistment)" during the summons at the end of each month by the Altındağ District Health Directorate between December 2021 and April 2022.

Ankara, where the study was conducted, is a province located in the Central Anatolia Region and is the capital of Turkey. Altındağ district, on the other hand, is one of

the most important districts of Ankara with its historical and cultural background.⁸

Candidates for military service in Turkey, within the framework of the cooperation protocol signed between the Ministry of Health and the Ministry of National Defense in line with the COVID-19 measures, had to give a PCR sample 48 hours before applying to the units they would perform their military service.⁹ Candidate soldiers could give PCR samples free of charge by applying to the district health directorates according to their residence addresses on the days determined during the summons.⁹ An average of 150 candidate soldiers applied within a month to Altındağ District Health Directorate to give PCR samples. 668 of these candidates agreed to participate during the 5-month study period.

Instrument and measures

A questionnaire form developed based on the literature was applied to the candidate soldiers who agreed to participate in the study under the supervision of the researchers. The first part consisted of socio-demographic characteristics (age, occupation, chronic disease status, etc.) the second part consisted of the European HL Scale Short Form. The Scale consists of the items of the "16 items European HL Survey Questionnaire (HLS-EU-Q16)" scale developed by the European HL Consortium within the scope of The European HL Survey (HLS-EU). Turkish Validity-Reliability Study of HLS-EU-Q16 was conducted by Emirali et al.¹⁰ HLS-EU-Q16 is in 5-point Likert type, and the answers given for each question are scored between 0 and 4. The standardised index score is used to calculate the total score obtained from the scale ($\text{Index} = (\text{mean} - 1) * (50/3)$). The index score ranges from 0 to 50, and the HL level of those who score 33 and above from is considered adequate. In the third part of the questionnaire, 17 propositions are answered as "True", "False", and "I don't know", questioning the level of knowledge and attitudes about COVID-19 disease, prepared in line with the COVID-19 guidelines of the Turkish Ministry of Health.^{11,12} Each correct answer given to the items was evaluated as 1 point, and wrong and "I don't know" answers were 0 points.

Statistical analysis

The data were analysed using the IBM SPSS (version 20.0) package program. Descriptive information of the

study group is presented with numbers, percentages, standard deviations, and mean. The conformity of the data to the normal distribution was evaluated with the Shapiro Wilk test. Chi-square and Mann Whitney U/ Kruskal Wallis tests and Spearman Correlation analysis were used in the univariate analysis. Cronbach alpha coefficient was calculated to determine the internal consistency of the COVID-19 knowledge level questions and found to be 0.85. The logarithm of the score obtained from the COVID-19 knowledge level questions according to the basis “E” was taken for multivariate analysis, and multiple linear regression analysis was applied. The statistical significance level was accepted as $p < 0.05$.

ETHICAL CONSIDERATIONS:

After obtaining the necessary official permissions, ethical approval dated:11.11.2021, numbered:11/4 was obtained from Institutional Review Board.

RESULTS:

The ages of the participants ($n=668$) ranged from 19-40 years (mean: 23.6 ± 3.3 years). The frequency of smoking was 55.4% ($n=370$). HL level was inadequate in 20.5% ($n=137$) of the participants. The frequency of inadequate HL was found to be higher in those who did not work and lived in an extended family ($p < 0.05$). The comparisons of HL levels according to the socio-demographic characteristics of the participants are shown in Table 1.

40.3% ($n=269$) of candidate soldiers were following the information about COVID-19 every day. The frequency of those who had not vaccinated against COVID-19 was 16.8% ($n=112$). There was no statistical significance between having been infected with COVID-19 and HL levels; and between having been infected with COVID-19 and COVID-19 knowledge levels. There was no statistical significance between being isolated/quarantined & COVID-19 knowledge and HL levels ($p > 0.05$ for each comparison). While there was no significant relationship between being vaccinated against COVID-19 and the HL levels ($p=0.526$), the COVID-19 knowledge level of those vaccinated was higher ($p=0.002$). The answers given by the candidate

soldiers to the questions about COVID-19 are shown in Table 2.

The scores of candidate soldiers on information questions about COVID-19 disease ranged from 0.0 to 17.0 (mean \pm SD: 12.0 ± 4.0 , median:13). While the propositions about COVID-19 disease symptoms and correct mask use were answered correctly at the highest rate, the most incorrectly answered proposition was “People with COVID-19 infection always show symptoms”. The COVID-19 knowledge level score was higher in those with adequate HL level, in the group aged 25 and over, non-smokers, and those with a university or higher education level (Table 5). The answers of the participants to questions on COVID-19 knowledge level are shown in Table 3, the results of the univariate analysis of the comparison of the COVID-19 knowledge level according to participants’ characteristics are shown in Table 4, and the results of the multivariate analysis are shown in Table 5.

There was a positive correlation between the COVID-19 knowledge level and HL levels of candidate soldiers ($r=0.108$; $p < 0.001$). The Correlation of the HL score and COVID-19 knowledge score is given in Chart 1.

DISCUSSION

This was the first study to measure candidate soldiers’ HL and COVID-19 knowledge levels. Most of the participants were young adult men, and 20.5% of them had inadequate HL. Although they would live in a crowded environment during their military service, vaccination rates were low compared to the general population, and the smoking rate was very high, which is associated with COVID-19 severity. Information gaps were identified in specific areas related to COVID-19, and a positive correlation was determined between HL and COVID-19 knowledge levels.

The rate of insufficient or problematic HL was found to be 47% from the comparative results of eight countries in Europe.¹³ The (pooled) prevalence of low HL in the European Union Member States was reported between 27-48% in a systematic review and meta-analysis.¹⁴ According to the Turkey Health Literacy Survey (2014), 24.5% of the population had inadequate HL level.¹⁵ In the HL study conducted with the patients who applied

to Family Healthcare Centres in the Çankaya district of Ankara, it was determined that the HL level of 20.9% of the participants was inadequate, almost at the same rate as our study, and it was reported that the HL level of the primary school graduates and those in the lower education group was lower.¹⁶ Although there was no statistically significant difference in our study, it was found that the HL level was lower in primary school graduates, and the COVID-19 knowledge level was significantly higher in university graduates.

Improving HL levels is one of the important agendas of public health to protect and develop health, improve health outcomes and eliminate inequalities in health.^{1,3,4} In our study, the COVID-19 knowledge level was higher in those with adequate HL. The positive correlation between the HL levels of the participants and their COVID-19 knowledge level suggests that improving HL levels can play an essential role in the control of the pandemic, have positive effects such as compliance with preventive measures, correct implementation of quarantine and treatment practices in case of infection, reducing the possibility of complication development, reducing negative health outcomes and potential costs.

Considering the higher COVID-19 knowledge level among university or higher education level graduates, it is recommended that governments take action to integrate health-related education into the curriculum, improve quality and quantity, access accurate health information and conduct HL studies starting from the elementary education.

According to the Turkey HL Survey, when people were asked about their first access to health information, 57.7% stated that they consulted a doctor, 19.9% said they accessed the internet, and 10.9% said they used television as a source.¹⁵ In a systematic review on HL in adolescents and young adults, the most frequently used source of health information was reported as the internet.¹⁷ Considering that the majority of the participants in our study were young adults, unsurprisingly, most of the candidate soldiers stated that they obtained information about COVID-19 through social media/the internet, similar to other studies.¹⁸ In a study conducted in Malaysia, the most common source of information about COVID-19 vaccination was reported as social media, with a rate of 85.3%.¹⁹ Only 10.8% in our study answered as health professionals,

and TV/radio was reported as the second most common source of information. According to these results, in the pandemic period when infodemic is a serious growing problem²⁰, it should be prioritized that the internet and media resources are constantly updated in accordance with scientific facts, and measures should be taken to prevent misinformation so that the public can access accurate and reliable information. Combined artificial intelligence such as a machine learning-based approach, HL guidelines, and fact-checking systems, which detect and prevent false information in the struggle against digital infodemic, is recommended in this respect.²¹ In addition, focus on studies on the use of the internet to increase HL levels may be recommended, considering the role of HL in empowering the public during the COVID-19 pandemic and correctly interpreting and applying health information.⁷

Although 40.3% of the participants in our study followed the news about COVID-19 every day, the vaccination rate was 83.2%. While the rate of one-dose vaccination against COVID-19 is 93.2% in Turkey, the rate of two doses of vaccination is 85.5%.²² The COVID-19 knowledge level of the vaccinated participants in our study was higher. The relatively low rate of vaccination among candidate soldiers, of which the majority were young adult males, and the relationship between COVID-19 knowledge level and vaccination suggest that urgent measures should be taken to combat the pandemic. In this age group, who are known to be more active and in contact with more people, the asymptomatic carriers are more common.²³ It should be prioritized to increase the vaccination rates for their own and for the public health, as well as to raise awareness about COVID-19 infection.

According to a systematic review and meta-analysis, smoking was associated with an increased risk of severe COVID-19, and smoking history was also associated with an increased risk of severe infection, need for mechanical ventilation and in-hospital mortality.²⁴ The Turkish Epidemiology Survey of Diabetes, Hypertension, Obesity and Endocrine Disease (TURDEP-II, 2010) reported that over 30% of males were current smokers²⁵. The expected smoking frequency for 2015 in Turkey, formed by linear regression equations, was reported as 18.8% (95%CI: 11.2–26.3) in men over 25.²⁶ However, in our study, the frequency of smoking was 55.4%. In

addition, COVID-19 knowledge level was higher in non-smokers. Considering not only the severity and outcomes of COVID-19 but also other acute and chronic effects of smoking, urgent measures should be taken against this high frequency.

88.8% of the participants stated that they started using masks after COVID-19. However, the cancellation of mask mandates in many countries worldwide, including Turkey²⁷⁻²⁹, may have caused a decrease in the use of masks in communities that previously followed protective measures, which may lead to an acceleration of viral spread since masks are effective Personal Protective Equipments (PPEs) in reducing the transmission of COVID-19.^{30,31}

In the present study, the majority of the participants gave wrong or 'I do not know' answers to the proposition: "Antibiotics are the most effective drugs in the treatment of COVID-19." The use of antibiotics in viral infections is ineffective and an important factor in developing antibiotic resistance. Studies conducted in different populations have similarly reported the misuse of antibiotics to treat viral infections.³² In addition, the unnecessary use of antibiotics in COVID-19 infection causes the consequence of increasing antimicrobial resistance.³³

In a cross-sectional study conducted in Middle Eastern countries at the beginning of the pandemic, it was reported that COVID-19 knowledge level was relatively low, and there was a lack of information, especially regarding the mode of transmission. It was stated that the propositions for asymptomatic carriers and COVID-19 infection in children were answered correctly at the lowest rate.³⁴ In our study, which we conducted almost two years later, although the correct response rates were higher, there was still a lack of information among the participants about the effects of COVID-19 in children and asymptomatic carriage.

It is not possible for individuals or a single organization to develop HL and accurately inform the public about the current COVID-19 pandemic and/or future outbreaks and thus to actively use preventive practices in infectious diseases. Although individuals have obligations in this regard; taking measures to include multiple stakeholders such as public resources, health service providers, non-governmental organizations, educational institutions, media organs, local governments, and organizing intervention programs and informative campaigns

is a necessity both in improving HL levels and in the management of the pandemic.

Limitations

Since this study was conducted with candidate soldiers in the Altındağ district, although the majority of participants were young adults, it cannot be generalized to a specific age group, all genders or nationwide. In addition, using the non-validated questionnaire developed by the researchers in accordance with the literature is one of the limitations. Another limitation is that since HL is a concept that encompasses a wide range of characteristics, it is not possible to measure all qualifications by only using the HLS-EU-Q16. In this regard, there is a need for more research and the development of standardized measurement tools.

CONCLUSIONS

The present study reveals the determination of HL and COVID-19 knowledge level of candidate soldiers and related factors and supports the necessity of proactive participation of individuals in combating infodemic with immediate action plans to increase HL and COVID-19 knowledge levels in young adults. Considering that men from all regions of the country with different socioeconomic levels and in various age groups are together during military service, we think that military service can be considered an opportunity to organize training related to COVID-19, HL and many public health areas. Inadequate HL is an important and compelling factor for health policies and practices. Inadequate HL and low awareness of COVID-19 among candidate soldiers who will live together in an environment where respiratory tract infections can spread rapidly during the pandemic are stimulants not only for COVID-19 but also for control of future epidemics and health crises. Therefore, raising public awareness and rapid development of HL levels are essential, and specific future studies are needed.

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No funding was received for this study.

Conflict of interest

All authors declare no competing interests.

Ethical clearance:

Ministry of Health of Turkey Scientific Research Platform and Dr Abdurrahman Yurtaslan Ankara Oncology Health Practice and Research Center Non-Interventional Clinical Research Ethics Committee approval (date:11.11.2021, number:11/4), and necessary official permissions from Altındağ District Health Directorate and Ankara Provincial Health Directorate were obtained for this study. Informed consent was obtained from each participant before starting the

questionnaire.

Author's contributions:

Idea owners of this study: HŞÇ and GÖE

Study design: HŞÇ, GÖE, AA, YEB, HHB, NİK and EE

Data gathering: AA, GÖE, YEB, HŞÇ, NİK, HHB

Statistical analysis: GÖE and YEB

Writing and submitting the manuscript: HŞÇ

Editing and approval of final draft: HŞÇ, GÖE, AA, YEB, HHB, NİK and EE

Table 1. The comparison of HL levels according to the socio-demographic characteristics

Socio-demographic characteristics		n (%)	HL Level		Statistical analysis*, p value
			Inadequate n (%)	Adequate n (%)	
Living place	City center	477 (71,4)	90 (18.9)	387 (81.1)	2.576; 0.097
	Rural area	191 (28,6)	47 (24.6)	144 (75.4)	
Age	≤24	414 (62,0)	82 (19.8)	332 (80.2)	0.329; 0.566
	≥25	254 (38,0)	55 (21.7)	199 (78.3)	
Marital status	Married	45 (6,7)	12 (26.7)	33 (73.3)	0.754; 0.385
	Single/Divorced	623 (93,3)	125 (20.1)	498 (79.9)	
Educational level	Primary-Secondary School	96 (14,4)	24 (25.0)	72 (75.0)	2.090; 0.352
	High School	218 (32,6)	47 (21.6)	171 (78.4)	
	University and beyond	354 (53,0)	66 (18.6)	288 (81.4)	
Working status	Civil servant	61 (9,1)	20 (32.8)	41 (67.2)	9.914; 0.007
	Employee	257 (38,5)	59 (23.0)	198 (77.0)	
	Unemployed	350 (52,4)	58 (16.6)	292 (83.4)	
Perceived Income Level	Good	83 (12,4)	16 (19.3)	67 (80.7)	2.772; 0.250
	Average	430 (64,4)	96 (22.3)	334 (77.7)	
	Bad	155 (23,2)	25 (16.1)	130 (83.9)	
Family type	Nuclear	525 (78,6)	99 (18.9)	426 (81.1)	4.105; 0.043
	Extended	143 (21,4)	38 (26.6)	105 (73.4)	
Smoking	Never smoked	239 (35,8)	46 (19.2)	193 (80.8)	2.821; 0.244
	Ex-smoker	59 (8,8)	8 (13.6)	51 (86.4)	
	Still smoking	370 (55,4)	83 (22.4)	287 (77.6)	
Alcohol consumption	Those who consume	86 (12,9)	15 (17.4)	71 (82.6)	0.374; 0.541
	Those who do not consume	582 (87,1)	122 (21.0)	460 (79.0)	
Presence of chronic diseases	Yes	18 (2,7)	4 (22.2)	14 (77.8)	0.773*
	No	650 (97,3)	133 (20.5)	517 (79.5)	
Presence of chronic diseases in first degree relatives	Yes	91 (13,6)	16 (17.6)	75 (82.4)	0.365; 0.546
	No	577 (86,4)	121 (21.0)	456 (79.0)	
Total		668 (100,0)	137 (20.5)	531 (79.5)	

*Fisher's exact test

Table 2. Questions about COVID-19

Question			
		n	%
How often do you follow information about COVID-19?	Every day	269	40,3
	Sometimes	291	43,6
	Rarely	92	13,8
	Never	16	2,4
Where do you follow information about COVID-19?*	Social Media/Internet	569	85,2
	TV/Radio	237	35,5
	Newspaper/Magazine/Book	59	8,8
	Family/Friends/Environment	122	18,3
	Healthcare professionals	72	10,8
Have you had a COVID-19 infection?	No	515	77,1
	Yes - I did not receive treatment. I was in quarantine at home.	64	9,6
	Yes - I was on medication, in-home quarantine.	84	12,6
	Yes - I received treatment in the inpatient clinic.	5	0,7
Have you ever been subject to isolation/quarantine due to infection or contact?	No	482	72,2
	Yes - I followed the isolation/quarantine rules.	183	27,4
	Yes - I didn't follow the isolation/quarantine rules.	3	0,4
What changes have occurred in your life with the COVID-19 infection?*	I don't care about COVID-19; my life hasn't changed.	54	8,1
	I wear a mask.	593	88,8
	I avoid crowded places.	462	69,2
	I wash my hands frequently.	503	75,3
	I use a hand sanitizer.	434	65,0
	I make sure to keep a distance of two meters between other people and me.	343	51,3
	I do not use public transport.	181	27,1
Have you had your COVID-19 vaccine? (at least one dose)	Yes	556	83,2
	No	112	16,8

*It was possible to tick more than one option.

Table 3. Responses of the participants to the COVID-19 disease knowledge level questions

COVID-19 Disease Knowledge Level Questions		n	%
The average incubation period of COVID-19 is 2-14 days.	Correct answers	524	78,4
	Wrong answers	27	4,1
	I do not know	117	17,5
The disease is transmitted mainly by droplets shed by individuals.	Correct answers	519	77,7
	Wrong answers	53	7,9
	I do not know	96	14,4
COVID-19 can also be transmitted due to contact with droplets released by sick individuals.	Correct answers	553	82,8
	Wrong answers	26	3,9
	I do not know	89	13,3

COVID-19 Disease Knowledge Level Questions		n	%
Individuals with chronic diseases such as Hypertension, Coronary Heart Disease, and Diabetes are in the risk group for COVID-19.	Correct answers	573	85,8
	Wrong answers	32	4,8
	I do not know	63	9,4
People with COVID-19 infection always show symptoms.	Correct answers	290	43,4
	Wrong answers	225	33,7
	I do not know	153	22,9
Symptoms of COVID-19 include fever, cough, myalgia, headache, sore throat, shortness of breath, loss of sense of taste, diarrhoea etc.	Correct answers	586	87,7
	Wrong answers	28	4,2
	I do not know	54	8,1
People without symptoms of COVID-19 are not contagious.	Correct answers	418	62,5
	Wrong answers	152	22,8
	I do not know	98	14,7
Antibiotics are the most effective drugs in the treatment of COVID-19.	Correct answers	288	43,1
	Wrong answers	172	25,7
	I do not know	208	31,2
Persons who are face-to-face with a COVID-19 patient at a distance of fewer than 2 meters for more than 10 minutes are considered close contacts.	Correct answers	478	71,6
	Wrong answers	49	7,3
	I do not know	141	21,1
People in close contact with a COVID-19 patient do not need to be quarantined.	Correct answers	439	65,7
	Wrong answers	147	22,0
	I do not know	82	12,3
Washing hands with soapy water at regular intervals for at least 20 seconds is one of the measures for transmitting the disease.	Correct answers	576	86,2
	Wrong answers	38	5,7
	I do not know	54	8,1
Proper use of face mask to cover the nose, mouth and chin is one of the protective measures.	Correct answers	586	87,7
	Wrong answers	35	5,2
	I do not know	47	7,1
People who have been infected with COVID-19 would not be infected again.	Correct answers	447	66,9
	Wrong answers	123	18,4
	I do not know	98	14,7
There are effective vaccines for COVID-19 disease.	Correct answers	503	75,3
	Wrong answers	66	9,9
	I do not know	99	14,8
People who are vaccinated are not at risk of contracting COVID-19.	Correct answers	448	67,1
	Wrong answers	116	17,4
	I do not know	104	15,5
COVID-19 does not pose a life-threatening risk to children.	Correct answers	309	46,3
	Wrong answers	192	28,7
	I do not know	167	25,0
COVID-19 is not transmitted to children.	Correct answers	367	54,9
	Wrong answers	85	12,8
	I do not know	216	32,3

Table 4. Univariate analysis results of the comparison of the knowledge level of COVID 19 disease according to the characteristics of the participants

Characteristics		COVID-19 Knowledge Level		Statistical analysis; p
		Mean (SD)	Median (Q1-Q3)	
Living place	City center	12.1 (4.0)	13.0 (9.0-15.0)	2.018; 0.044
	Rural area	11.6 (3.9)	12.0 (9.0-15.0)	
Age	≤24	11.2 (4.0)	12.0 (9.0-14.0)	7.313; 0.000
	≥25	13.3 (4.0)	13.0 (9.0-15.0)	
Marital status	Married	13.0 (4.2)	15.0 (11.0-16.0)	2.364; 0.018
	Single/Divorced	11.9 (3.9)	13.0 (9.0-15.0)	
Educational level	Primary-Secondary School	10.2 (4.2)	10.5 (8.0-13.5)	75.479; 0.000
	High School	10.9 (3.9)	11.0 (9.0-14.0)	
	University and beyond	13.1 (3.6)	14.0 (11.0-16.0)	
Working status	Government official	13.7 (3.0)	15.0 (12.0-16.0)	16.263; 0.000
	Employee	11.4 (4.2)	12.0 (9.0-15.0)	
	Unemployed	12.1 (3.8)	13.0 (10.0-15.0)	
Perceived Income Level	Good	12.1 (4.3)	13.0 (9.0-16.0)	4.317; 0.115
	Middle	12.2 (3.8)	13.0 (10.0-15.0)	
	Bad	11.4 (4.2)	12.0 (9.0-15.0)	
Family type	Nuclear	12.2 (3.9)	13.0 (10.0-15.0)	3.460; 0.001
	Extended	11.0 (4.1)	12.0 (8.0-14.0)	
Smoking	Never smoked	12.7 (3.3)	13.0 (11.0-15.0)	10.266; 0.006
	Ex-smoker	12.0 (4.0)	13.0 (9.0-15.0)	
	Still smoking	11.5 (4.3)	13.0 (9.0-15.0)	
Alcohol consumption	Those who consume	12.3 (3.9)	13.5 (10.0-15.0)	0.980; 0.327
	Those who do not consume	11.9 (4.0)	13.0 (9.0-15.0)	
Presence of chronic diseases	Yes	13.2 (2.8)	13.5 (12.0-16.0)	1.131; 0.258
	No	11.9 (4.0)	13.0 (9.0-15.0)	
Presence of chronic diseases in first degree relatives	Yes	13.0 (3.7)	14.0 (11.0-16.0)	3.083; 0.002
	No	11.8 (4.0)	13.0 (9.0-15.0)	
HL Level	Adequate	12.3 (3.8)	13.0 (10.0-15.0)	3.298; 0.001
	Inadequate	10.9 (4.4)	11.0 (8.0-15.0)	

Table 5. Multivariate analysis results of the comparison of the knowledge level of COVID 19 disease according to the characteristics of the participants

	Standardize Beta; p	%95 GA
Living place	0.030; 0.421	-0.052-0.125
Age	0.145; 0.001	0.064-0.259
Marital status	0.017; 0.652	-0.199-0.125
Educational level	0.125; 0.005	0.028-0.158
Working status	0.054; 0.155	-0.074-0.012
Family type	0.056; 0.138	0.024-0.172
Smoking	0.116; 0.002	-0.110—0.024
Presence of chronic diseases in first degree relatives	0.033; 0.380	-0.064-0.168
HL Level	0.117; 0.002	0.058-0.254

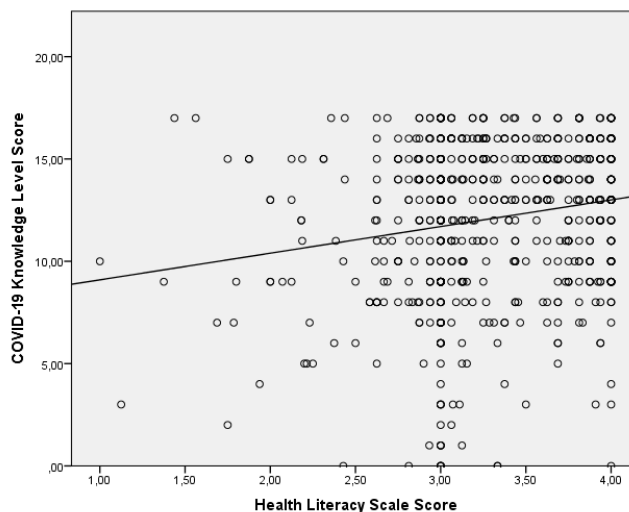


Chart 1. The Correlation of the HL score and COVID-19 knowledge score

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