Health Literacy and COVID-19 Awareness Among Preservice Primary School Teachers and Influencing Factors in Turkey

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ABSTRACT

BACKGROUND: Primary school teachers play an important role in furnishing children with basic knowledge about health literacy and awareness of COVID-19. This study was conducted to determine the levels of health literacy and COVID-19 awareness among preservice primary school teachers and the factors associated with this.

METHODS: The sample of this cross-sectional and correlational study consists of 978 preservice primary school teachers studying at 4 major universities in Turkey. The participation rate was 90.14%. Data were collected with 3 questionnaires, the Descriptive Characteristics Form, the Health Literacy Scale, and the COVID-19 Awareness Scale.

RESULTS: The mean score of the Health Literacy scale was 105.16 (SD = 13.04). The mean scores of the Contagion Precaution Awareness, Awareness of Following Current Developments, and Hygiene Precaution Awareness subscales of the Coronavirus Awareness Scale were 34.27 (SD = 6.19), 12.94 (SD = 4.34), and 11.69 (SD = 3.60), respectively. It was determined that the total health literacy score was affected by gender, school, and grade/year (freshman, sophomore, junior, senior) and that COVID-19 awareness was affected by gender, age, grade/year, school, having contracted COVID-19 or not, and being vaccinated or not in the various subscales (p < 0.05).

CONCLUSIONS: Preservice primary school teachers’ health literacy was found to be sufficient with a moderate level of COVID-19 awareness. We recommend planning interventions for preservice primary school teachers that will improve their health literacy and COVID-19 awareness, taking influential factors into account when doing this planning.

Keywords: health literacy; COVID-19 pandemic; awareness; primary schools; children.

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BACKGROUND

In today’s health care system, individuals are expected to use health services, adopt healthy lifestyle behaviors, make decisions about their health, and know their responsibilities and rights. This expectation can only be fulfilled if the individual has sufficient health literacy.1 After the COVID-19 pandemic was declared, health literacy became a necessary part of life along with having information about the disease. Many fundamental and current health information topics are learned during childhood and continue throughout life.2 Primary school teachers carry a great responsibility in creating health literacy in children and raising awareness of COVID-19.3 Teachers must have sufficient levels of health literacy and COVID-19 awareness if they are to accomplish this task. To this end, it is thought that teachers’ health literacy and COVID-19 awareness should be ascertained and addressed during their undergraduate education.

Health literacy is defined as the cognitive and social skills that determine an individual’s ability to access, understand, appraise, and apply information on health-related issues.4 What matters is establishing the foundation for health literacy in early childhood and gradually building on it.3 Studies show that more than half of children have only a moderate level of...
health literacy and this needs to be improved. The development of health literacy in children depends on the health literacy level of their teachers, who spend a lot of time with them in the school environment and are also their role models. It is thought that teachers directly influence students’ health literacy and can shape these levels. A study conducted in Iran reported that more than half of preservice teachers have “inadequate-problematic” health literacy. Three studies conducted in Turkey found health literacy levels to be inadequate/problematic in 49.6% of teachers, inadequate/problematic in 52%, and limited/very limited in 73.8%.

Educational institutions took a break from formal education after the World Health Organization announced the COVID-19 pandemic in March 2020. However, face-to-face education was reintroduced at all education levels in Turkey and many other countries in 2021. The resumption of face-to-face education, even though the pandemic is still not over, introduces various risk factors. Students have to be made aware of COVID-19 and how to protect themselves from it following the return of face-to-face education in school settings. COVID-19 awareness entails knowing the protective measures to take against COVID-19, the symptoms of the disease, the importance of vaccination, and the treatment process. Teachers are expected to instill COVID-19 awareness in children at school. Studies on COVID-19 conducted among teachers do not reflect awareness, only immunization, and report that more than half of teachers intend to be vaccinated against COVID-19. One study conducted in Turkey reported that more than half of teachers were not vaccinated against COVID-19. UNICEF’s “Interim Guidance for COVID-19 Prevention and Control in Schools” document states that children should be given basic and age-appropriate information about the coronavirus disease, including the symptoms of COVID-19, how it is transmitted, and how to prevent transmission. That same source recommends that teachers encourage children to ask questions and voice concerns about the COVID-19 pandemic.

Primary school teachers must provide children with basic information about health literacy and awareness of COVID-19 during the primary school period. The literature has only 1 study on health literacy among preservice teachers. However, no study has been found on COVID-19 awareness. The purpose of this study is to fill that gap. This study aimed to determine the levels of health literacy and COVID-19 awareness among preservice teachers and the factors associated with this.

Research questions

1. What is the health literacy level of preservice primary school teachers?
2. What is the COVID-19 awareness level of preservice primary school teachers?
3. What are the factors affecting the health literacy of preservice primary school teachers?
4. What are the factors affecting the COVID-19 awareness of preservice primary school teachers?
5. Is there a relationship between preservice primary school teachers’ health literacy and their COVID-19 awareness?
6. What are the factors that predict the health literacy of preservice primary school teachers?

METHODS

Study Design and Study Sample
This is a cross-sectional study using descriptive analysis. The study’s population consisted of preservice primary school teachers studying at 4 major universities in Ankara. The primary school teaching departments of the universities included in the study were coded as A, B, C, and D. Schools A and B are located in the city center and schools C and D school on a campus far from the city center. The study’s population consists of 1085 students (preservice primary school teachers) consisting of 305 students in school A, 300 students in school B, 280 students in school C, and 200 students in school D. An attempt was made to reach the entire population without having to resort to sampling selection. Ultimately, 978 students voluntarily participated in the study, making a participation rate of 90.14%. The study data were collected using a Descriptive Characteristics Form, the Health Literacy Scale (HLS), and the COVID-19 Awareness Scale (CAS).

INSTRUMENTS

Descriptive characteristics form
This form asked questions about the individual’s age, gender, grade/year, chronic disease history, whether or not they had contracted COVID-19, and whether or not they had been vaccinated against COVID-19 (type and number of doses).

Health literacy scale
Toçi, Bruzari, and Sorenson worked together to simplify the 47-item HLS-EU (Health Literacy Survey in Europe) form first developed by Sorensen. Aras and Bayik Temel made the validity and reliability analysis of the Turkish version of the scale. The HLS consists of 25 items and 4 subscales (Access, Understand, Appraise, and Apply information). Access has 5 items (Items 1-5); Understand, 7 items (6-12); Appraise, 8 items (13-20); and Apply, 5 items (21-25). The minimum score is 25 and the maximum score is 125 for the whole scale. The answers are presented in a Likert-type scale: “5: I have no difficulty;
4: I have little difficulty; 3: I have some difficulty; 2: I have a lot of difficulty; 1: I cannot/I have no skill/it is impossible.” Low scores indicate inadequate, problematic, and weak health literacy, while high scores indicate adequate and excellent health literacy. The higher the score, the higher the individual’s health literacy level. The scale’s α value in the validity and reliability study is 0.92. The Cronbach alpha coefficient was found to be 0.91 in our study.

COVID-19 awareness scale
The scale developed by Bilgin16 consists of 17 items. It is a 5-point Likert scale ranging from Never (1) to Always (5). The scale has 3 subscales (Contagion Precaution Awareness, Awareness of Following Current Developments, Hygiene Precaution Awareness) that are evaluated separately. The highest possible score for the Contagion Precaution Awareness subscale (1-9 items) is 45, and the highest possible score for each of the Awareness of Following Current Developments (10-13 items), and Hygiene Precaution Awareness (14-17 items) subscales is 20. A high score in a subscale indicates a high level of awareness in that subscale. In the validity and reliability study, the Cronbach Alpha internal consistency reliability coefficients of the CAS were found to be 0.93 for Contagion Precaution Awareness, 0.87 for Awareness of Following Current Developments, and 0.82 for Hygiene Precaution Awareness. Cronbach’s alpha in this study was 0.84 for Contagion Precaution Awareness, 0.89 for Current Developments in Health Care, and 0.74 for Hygiene Precaution Awareness.

DATA COLLECTION
The study was conducted between September and November 2021. The administrations of the institutions participating in the study were first consulted to determine the best dates and times for collecting the data. The data were collected face to face by going to the relevant schools on the agreed-on dates and times. The preservice teachers had to give their informed consent before filling in the data collection forms. Those who consented to participate in the study filled in the data collection forms. Each preservice teacher took 15-20 minutes to fill in the data collection forms.

Data Analysis
Data were evaluated using the SPSS v.14.01 (Chicago, IL). The statistical methods to be used in the study were determined by performing the Kolmogorov-Smirnov test whether or not the average scores of the scale and subscales showed normal distribution. We determined that the skewness and kurtosis values (in the range of −1.5 to 1.5), which are indicators of the normality of the data, were within normal limits in all the subscales of both scales. The t test for independent groups, one of the parametric statistical methods, was used to compare the means of 2 independent groups, and the one-way analysis of variance (ANOVA) test was used to compare the means of 3 or more groups. Tukey’s multiple comparison test was used to identify the groups from which the differences found using ANOVA came. The relationship between the HLS and CAS subscales was examined using Pearson correlation analysis. Multiple linear regression analysis was performed to determine the predictive level of sociodemographic variables and the CAS subscales for the HLS total score. The variables that contributed significantly to the model were determined using the backward selection method in the regression analysis and included in the model. The existence of multiple correlations between variables was evaluated with the variance inflation factor (VIF) and tolerance. Variables with a tolerance value >0.2 and a VIF value <10 were included in the regression analysis. The significance level was accepted as 0.05.

RESULTS
Table 1 shows that 83.4% (n = 816) of the participants were female, 52.7% (n = 515) were aged 17-20, 31% (n = 303) were from A school, 28.4% (n = 278) were juniors, 6.7% (n = 66) had a chronic disease, 75.4% (n = 737) had not contracted COVID-19, 2.5% (n = 24) had not been vaccinated against COVID-19, 91.3% (n = 893) had 2 doses of COVID-19 vaccine, and 85.2% (n = 834) had the Biontech vaccine.

The mean score of the Health Literacy scale was 105.16 (SD = 13.04). Table 2 shows that the mean scores of the Contagion Precaution Awareness, Awareness of Following Current Developments, and Hygiene Precaution Awareness subscales of the CAS were 34.27 (SD = 6.19), 12.94 (SD = 4.34), and 11.69 (SD = 3.60), respectively.

Women were found to have a significantly higher mean score than men in the total HLS score and all subscales (p < 0.05). When evaluated by age group, no significant difference was found between the age groups in terms of HLS and its subscales (p > 0.05). When the school scores were compared, the preservice teachers in School A were found to have a significantly higher level of health literacy than those in School C in the HLS total score and all subscales (p < 0.05). The health literacy level of the students in School D was found to be significantly higher than that of the students in School C in the Access to Information and Application subscales of the HLS (p < 0.05). When evaluated by grade/year, the mean score of the senior students in the Access, Understand, and Appraise subscales was found to be significantly higher than that of the freshman students (p < 0.05). The mean
status, there was no significant difference in the overall HLS and the subscales (p > 0.05) (Table 3).

When CAS scores were evaluated by gender, the women’s Contagion Precaution Awareness and Hygiene Precaution Awareness subscale scores were significantly higher than the men’s (p < 0.05). The mean score was found to be significantly higher for participants aged 21-26 in the Contagion Precaution Awareness and Awareness of Following Current Developments subscales than the participants aged 17-20 when evaluated by age (p < 0.05). When the school scores were compared, it was found that the preservice teachers in the A and D schools scored significantly higher than those in the C school in the Contagion Precaution Awareness, Awareness of Following Current Developments, and Hygiene Precaution Awareness subscales (p < 0.05).

The preservice teachers in School B were scored significantly higher than those in School C in the Awareness of Following Current Developments subscale (p < 0.05). When evaluated by grade/year, the senior students had a significantly higher mean score in the Contagion Precaution Awareness subscale than the freshman students (p < 0.05). The junior and senior students scored significantly higher than the freshman students in the Awareness of Following Current Developments subscale (p < 0.05). It was determined that the mean score of those with a chronic disease did not differ significantly from those without a chronic disease in the CAS subscales (p > 0.05). Those who had not contracted COVID-19 and those who had been vaccinated against the disease had significantly high mean scores in the Hygiene Precaution Awareness subscale (p < 0.05) (Table 4).

When the correlation between the HLS and CAS subscales was examined, a moderate correlation was found between the Contagion Precaution Awareness subscales (r = 0.342), and a positive low-level correlation was found between the Awareness of Following Current Developments subscales and the Hygiene Precaution Awareness subscales (r = 0.270, r = 0.262, respectively) (Table 5). The regression model established to test whether HLS is affected by gender, chronic disease, and the CAS subscales is significant (F = 41.717, p < .001). Gender, chronic disease, the CAS Contagion Precaution Awareness and Awareness of Following Current Developments subscales explain 14.3% of the health literacy level of preservice teachers (Table 6).

**DISCUSSION**

This study determined that the health literacy level of preservice primary school teachers was sufficient and their COVID-19 awareness level was moderate. This section discusses the variables that affect the Health Literacy Scale and COVID-19 Awareness Scale.

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Table 1. Descriptive Characteristics (N = 978)

| Characteristic                  | n   | %    |
|--------------------------------|-----|------|
| Gender                         |     |      |
| Female                         | 816 | 83.4 |
| Male                           | 162 | 16.6 |
| Age                            |     |      |
| 17-20                           | 515 | 52.7 |
| 21 and above                    | 463 | 47.3 |
| School                         |     |      |
| A                               | 303 | 31.0 |
| B                               | 283 | 29.0 |
| C                               | 243 | 24.8 |
| D                               | 149 | 15.2 |
| Grade                          |     |      |
| First (freshman)                | 255 | 26.1 |
| Second (sophomore)              | 250 | 25.6 |
| Third (junior)                  | 278 | 28.4 |
| Fourth (senior)                 | 195 | 19.9 |
| Having chronic disease          |     |      |
| Yes                            | 66  | 6.7  |
| No                             | 912 | 93.3 |
| Having contracted COVID-19      |     |      |
| Yes                            | 241 | 24.6 |
| No                             | 737 | 75.4 |
| Covid-19 vaccination status     |     |      |
| Yes                            | 954 | 97.5 |
| No                             | 24  | 2.5  |
| Covid-19 vaccine dose           |     |      |
| First                          | 40  | 4.1  |
| Second                         | 893 | 91.3 |
| Third                          | 21  | 2.1  |
| Covid-19 vaccine type           |     |      |
| BioNTech                       | 834 | 85.2 |
| Sinovac                        | 120 | 12.3 |

Table 2. Mean Scores of Health Literacy Scale and COVID-19 Awareness Scale

| Scales                                      | Mean (SD) | Min.-Max. |
|---------------------------------------------|-----------|-----------|
| HLS overall score                           | 105.16 (13.04) | 25-125    |
| HLS access                                  | 21.83 (2.99)   | 5-25      |
| HLS understanding                           | 29.40 (4.07)   | 7-35      |
| HLS appraisal                               | 33.18 (5.14)   | 8-40      |
| HLS application                             | 20.74 (3.34)   | 5-25      |
| CAS contagion precaution awareness          | 34.27 (6.19)   | 9-45      |
| CAS awareness of following current          | 12.94 (4.34)   | 4-20      |
| developments                                |            |
| CAS hygiene precaution awareness            | 11.69 (3.60)   | 4-20      |

HLS, Health Literacy Scale; CAS, COVID-19 Awareness Scale.
Health literacy level is a skill that can be changed and improved with education and one that preservice teachers need to develop before they graduate. Given the findings of this study, it can be said that the health literacy level of preservice primary school teachers is sufficient but should be increased because it is below the maximum score. Their health literacy levels could be sufficient because the sample group in this study consisted of young people willing to do research and learn and because the pandemic has increased health awareness in general. The other studies that have been done state that the health literacy levels of primary school teachers working in the field are limited-problematic. The difference between their results and this study may be because this study’s sample group consists of preservice teachers while the studies in the literature use in-service primary school teachers, or it could be due to sociocultural factors. This study found that women’s health literacy levels were significantly higher than men’s with respect to the total scale score and all the subscales, including Access, Understand, and Appraise subscales, and that gender was a predictor variable of health literacy levels. Many studies have reported that women have a higher level of health literacy. In addition, women’s scores in the Contagion Precaution Awareness, Application, and Hygiene Precaution Awareness subscales were found to be statistically higher in this study, too.

### Table 3. Distribution of HLS and Subscales Scores According to Descriptive Characteristics

| Variables                        | n   | HLS Overall Score, Mean (SD) | Access, Mean (SD) | Understanding, Mean (SD) | Appraisal, Mean (SD) | Application, Mean (SD) |
|----------------------------------|-----|------------------------------|-------------------|--------------------------|----------------------|------------------------|
|                                 |     | Mean (SD)                   |                   |                          |                      |                        |
| Gender                           |     | 816                         | 106.01 (12.61)    | 21.92 (2.92)             | 29.71 (3.91)         | 33.48 (4.99)           | 20.88 (3.26)           |
| Test value                       |     | 162                         | 100.86 (14.28)    | 21.40 (3.29)             | 27.83 (4.47)         | 31.61 (5.57)           | 20.01 (3.64)           |
|                                 | t   | .004                        |                   |                          |                      |                        |                        |
| Age                              |     | 17-20 515                   | 104.59 (12.81)    | 21.73 (2.96)             | 29.17 (4.00)         | 32.96 (4.91)           | 21.03 (3.27)           |
| Test value                       |     | 21-26 463                   | 105.79 (13.28)    | 21.95 (3.02)             | 29.65 (4.13)         | 33.42 (5.14)           | 20.76 (3.39)           |
|                                 | t   | −.113                       | −1.163            | −1.833                   | −1.410               | −.015                  |                            |
|                                 | p   | .154                        |                   | .067                     | .159                 | .002                   |                            |
| School                           |     | A 303                       | 107.14 (12.49)    | 22.08 (2.99)             | 29.96 (3.89)         | 33.92 (4.84)           | 21.18 (3.24)           |
|                                 | B   | 283                         | 104.77 (12.35)    | 21.89 (2.72)             | 29.34 (3.87)         | 32.96 (4.91)           | 20.56 (3.27)           |
|                                 | C   | 243                         | 102.61 (13.94)    | 21.62 (2.33)             | 28.65 (4.27)         | 32.51 (5.45)           | 20.18 (3.40)           |
|                                 | D   | 149                         | 106.01 (13.27)    | 22.17 (2.97)             | 29.58 (4.29)         | 33.15 (5.46)           | 21.10 (3.47)           |
| Test value                       |     | F 5.805                     | F = 4.375         | F = 4.802                | F = 3.672            | F = 4.869              |                            |
|                                 | t   | .152                        |                   | .245                     | .067                 | .159                   |                            |
|                                 | p   | .515                        |                   | .218                     | .985                 | .752                   |                            |
|                                 |     | First 255                   | 103.65 (12.64)    | 21.60 (2.99)             | 28.81 (3.85)         | 32.53 (5.30)           | 20.70 (3.11)           |
|                                 | Second | 250                     | 105.68 (13.44)    | 21.80 (3.04)             | 29.53 (4.23)         | 33.51 (5.14)           | 20.82 (3.43)           |
|                                 | Third | 278                      | 104.32 (12.41)    | 21.62 (3.03)             | 29.25 (3.89)         | 33.02 (4.79)           | 20.42 (3.35)           |
|                                 | Fourth| 195                       | 107.66 (13.59)    | 22.49 (2.77)             | 30.21 (4.26)         | 33.81 (5.30)           | 21.14 (3.48)           |
| Test value                       |     | F = 4.054                   | F = 4.078         | F = 4.581                | F = 2.783            | F = 1.886              |                            |
|                                 | t   | .007                        |                   | .003                     | .040                 | .134                   |                            |
|                                 | p   | .005                        |                   | .006                     | .134                 |                       |                            |
|                                 |     | Chronic disease             |                   |                          |                      |                        |                        |
|                                 | Yes  | 66                         | 108.69 (13.62)    | 22.51 (2.66)             | 30.54 (3.96)         | 34.28 (5.47)           | 21.34 (3.32)           |
|                                 | No   | 912                        | 104.90 (12.97)    | 21.79 (3.00)             | 29.31 (4.06)         | 33.10 (5.11)           | 20.70 (3.34)           |
| Test value                       |     | t = 2.284                   | t = 1.903         | t = 2.370                | t = 1.821            | t = 1.517              |                            |
|                                 | t   | .023                        |                   | .057                     | .018                 | .069                   | .130                   |
|                                 | p   | .130                        |                   | .006                     | .130                 |                       | .130                   |
|                                 |     | Having contracted COVID-19  |                   |                          |                      |                        |                        |
|                                 | Yes | 241                        | 104.29 (12.60)    | 21.85 (2.77)             | 29.25 (3.97)         | 32.85 (5.08)           | 20.32 (3.33)           |
|                                 | No  | 737                        | 105.44 (13.18)    | 21.83 (3.06)             | 29.45 (4.10)         | 33.28 (5.15)           | 20.88 (3.34)           |
| Test value                       |     | t = 1.190                   | t = 0.091         | t = −.517                | t = −1.121           | t = −2.214             |                            |
|                                 | t   | .234                        |                   | .927                     | .648                 | .262                   | .027                   |
|                                 | p   | .130                        |                   | .006                     | .130                 |                       | .130                   |
|                                 |     | Covid-19 vaccination status |                   |                          |                      |                        |                        |
|                                 | Yes | 954                        | 105.11 (13.09)    | 21.82 (3.00)             | 29.40 (4.07)         | 33.15 (5.17)           | 20.74 (3.34)           |
|                                 | No  | 24                         | 106.87 (11.11)    | 22.58 (2.55)             | 29.41 (3.86)         | 33.91 (3.84)           | 20.95 (3.49)           |
| Test value                       |     | t = −0.651                  | t = −1.234        | t = 0.019                | t = −0.315           | t = −0.315             |                            |
|                                 | t   | .515                        |                   | .218                     | .985                 | .752                   | .752                   |
|                                 | p   | .515                        |                   | .218                     | .985                 | .752                   | .752                   |

**t** test.

† ANOVA test.

HLS, Health Literacy Scale.

Significant values are in bold.
Table 4. Distribution of COVID-19 Awareness Scale Scores According to Descriptive Characteristics

| Variables          | n   | Contagion Precaution Awareness, Mean (SD) | Awareness of Following Current Developments, Mean (SD) | Hygiene Precaution Awareness, Mean (SD) |
|--------------------|-----|-------------------------------------------|-----------------------------------------------------|----------------------------------------|
| Gender             |     | Contagion Precaution                      | Awareness of Following Current Developments          | Hygiene Precaution                      |
|                    |     | Awareness, Mean (SD)                      |                                                     | Awareness, Mean (SD)                    |                                                      |
| Gender             |     | Female 816                                | 34.75(5.95)                                          | 13.04(4.30)                            | 12.03(3.50)                                          |
|                    |     | Male 162                                  | 31.85(6.78)                                          | 12.45(4.54)                            | 10.05(3.65)                                          |
|                    |     | Test value                                | t = 5.070                                             | t = 1.585                              | t = 6.325                                           |
|                    | *p  | <.001                                     | .113                                                 | .006                                   | <.001                                               |
| Age                |     | 17-20 515                                 | 33.61(6.12)                                          | 12.58(4.39)                            | 11.58(3.45)                                          |
|                    |     | 21-26 463                                 | 35.00(6.19)                                          | 13.35(4.26)                            | 11.82(3.78)                                          |
|                    |     | Test value                                | t = −3.515                                            | t = −2.742                             | t = −1.077                                           |
|                    | *p  | <.001                                     | .006                                                 | .282                                   |                                                      |
| School             |     | A 303                                     | 35.01(6.25)                                          | 13.62(4.37)                            | 12.44(3.82)                                          |
|                    |     | B 283                                     | 34.34(6.09)                                          | 12.85(4.10)                            | 11.73(3.42)                                          |
|                    |     | C 243                                     | 32.79(5.57)                                          | 12.01(4.43)                            | 10.67(3.34)                                          |
|                    |     | D 149                                     | 35.02(6.80)                                          | 13.26(4.37)                            | 11.77(3.53)                                          |
|                    |     | Test value                                | F = 6.999                                             | F = 6.576                              | F = 11.240                                           |
|                    | *p  | <.001                                     | .006                                                 | .282                                   |                                                      |
| Posthoc: C < A-D   |     |                                           |                                                      |                                                      |                                                      |
| Grade              |     | First 255                                 | 33.30(5.85)                                          | 12.10(3.91)                            | 11.36(3.29)                                          |
|                    |     | Second 250                                | 34.25(6.32)                                          | 12.79(4.61)                            | 11.72(3.56)                                          |
|                    |     | Third 278                                 | 34.27(5.93)                                          | 13.30(4.26)                            | 11.60(3.63)                                          |
|                    |     | Fourth 195                                | 35.58(6.60)                                          | 13.72(4.48)                            | 12.22(3.95)                                          |
|                    |     | Test value                                | F = 5.049                                             | F = 6.120                              | F = 2.171                                            |
|                    | *p  | <.001                                     | .002                                                 | .900                                   |                                                      |
| Posthoc: 1 < 4     |     |                                           |                                                      |                                                      |                                                      |
| Chronic disease    |     | Yes 66                                    | 35.13(6.51)                                          | 13.34(4.62)                            | 12.09(4.03)                                          |
|                    |     | No 912                                    | 34.20(6.16)                                          | 12.91(4.32)                            | 11.67(3.57)                                          |
|                    |     | Test value                                | t = 1.175                                             | t = 0.781                              | t = 0.916                                            |
|                    | *p  | .240                                      | .435                                                 | .360                                   |                                                      |
| Having contracted COVID-19 | | Yes 241                                  | 33.63(6.08)                                          | 12.47(4.28)                            | 10.92(3.59)                                          |
|                    |     | No 737                                    | 34.48(6.21)                                          | 13.09(4.36)                            | 11.95(3.57)                                          |
|                    |     | Test value                                | t = −1.843                                            | t = −1.925                             | t = −3.861                                           |
|                    | *p  | .066                                      | .054                                                 | .360                                   |                                                      |
| Posthoc: 1 < 3-4   |     |                                           |                                                      |                                                      |                                                      |
| Covid-19 vaccination status | | Yes 954                                  | 34.32(6.12)                                          | 12.97(4.34)                            | 11.73(3.58)                                          |
|                    |     | No 24                                     | 32.00(8.38)                                          | 11.62(4.25)                            | 10.20(4.01)                                          |
|                    |     | Test value                                | t = 1.822                                             | t = 1.506                              | t = 2.053                                            |
|                    | *p  | .069                                      | .132                                                 | .040                                   |                                                      |
| *t test.           |     |                                           |                                                      |                                                      |                                                      |
| † ANOVA test.      |     |                                           |                                                      |                                                      |                                                      |
| Significant values are in bold.

In this study, the preservice teachers in School A were found to score significantly higher than those in School C in all the subscales of both scales in terms of both health literacy and COVID-19 awareness levels. This may be because School A is close to health care institutions and in a central location. Proximity to health institutions can increase preservice teachers’ HL skills in accessing, understanding, appraising, and applying information. On the other hand, being in a central location may contribute to increased COVID-19 awareness among preservice teachers because this lets them take part in city life by walking or taking public transport to school and home again. They can hear public service announcements made by the municipality and the Ministry of Health, and they can benefit from the information given to the public in health-related matters. The preservice teachers

the literature. Furthermore, women in Turkish society play an important role in the care of children and all family members. If there is a health problem in the family, the women usually take care of it. Accordingly, it is usually the women in the family who read and research health issues to solve the health problems of family members. This may explain why women have higher HL COVID-19 awareness scores than men.
in School C scored significantly lower than those in School D in the CAS Acces and Appraise subscales. Again, the preservice teachers in School C scored significantly lower than those in School B in the CAS Precaution Awareness subscale. One reason why the preservice teachers studying in School C have lower scores on both scales when compared to the other schools could be due to the school’s location. School C is located on an isolated campus, further from the city center and health institutions than the other schools, and most of the students live on campus in dormitories. The preservice teachers who went to School C might not have been able to take part in city life or benefit from the announcements and information made for society for just this reason and this may have affected the HLS scores. The other reason may be the inadequacy of work on campus aimed at health and COVID-19 awareness.

The senior students in this study scored significantly higher than the freshman students in the HLS total score and the Access, Understand, and Appraise subscales. This study also determined that the scores of preservice teachers aged over 20 and in their senior year were higher in the CAS Hygiene Precaution Awareness and Awareness of Following Current Developments subscales. These findings suggest that senior students over the age of 20 are more knowledgeable on these subjects.

High health literacy plays a role in the successful self-management of chronic diseases. This study found that the health literacy level of individuals with a chronic disease was significantly higher than those without a chronic disease, and the presence of chronic disease was one of the variables that predicted the level of health literacy. The literature supports the conclusion that individuals with chronic diseases have higher health literacy. This finding may be because individuals with chronic diseases have adopted a more careful lifestyle to manage their chronic diseases.

The scores of the preservice teachers who had not contracted COVID-19 were found to be significantly higher in the HLS Application subscale. The HLS Application subscale includes the statements of health professionals regarding general and vaccination recommendations, advising people to change harmful habits, use healthy products, and make use of health-related information. Preservice teachers who have not contracted COVID-19 may have more advanced skills that cover these expressions because they worry more about becoming infected. This study found that the mean score in the CAS Hygiene Precaution Awareness subscale of those who had not contracted COVID-19 and those who had been vaccinated against the virus was significantly higher. The Hygiene Precaution Awareness subscale includes wearing gloves when going out, wiping frequently used places such as door handles at home, washing the clothes worn outside without letting them wait, and cleaning the products brought into the house from outside. This can be explained by the fact that those who have not contracted COVID-19 and those who have had the COVID-19 vaccine take better hygiene measures, are more mindful of disease transmission, and act carefully.

The regression model used in the study determined that gender, chronic disease, and the CAS Contagion Precaution Awareness and Awareness of Following Current Developments subscales predicted the health literacy levels of preservice teachers at a rate of 14.3%. The explained variance changed by less than 1% when chronic disease and gender were excluded from the model. It can thus be said that the most important variables of the model are the two subscales of the CAS scale. The Contagion Precaution Awareness subscale includes such expressions as paying attention to social distancing, going to a health institution when COVID-19 symptoms appear, not leaving the house unless it is necessary, and hand hygiene. The Awareness of Following Current Developments subscale includes items about following the COVID-19-related news, following the statements made by the Ministry of Health, and following information about COVID-19 at the national and global level. The CAS Contagion Precaution Awareness and Awareness of Following Current Developments subscales may have contributed to the increase in the health literacy

![Table 6. Regression Model Predicting Health Literacy Scale](https://example.com/table6.png)

*Significance level was accepted as p < .05.

CAS, COVID-19 Awareness Scale; CI, confidence interval; β, standardized regression coefficient.

Durbin-Watson = 2.039; F = 41.717, p < .001; R² = 0.383; Adjusted R² = 14.3%.
score since they included expressions of awareness of COVID-19 that covered health protection.

Limitations
Some limitations should be considered when interpreting the results of this study. First, the findings are limited to the sample of the study, so generalizations should be made with caution. Second, the findings are limited to the evaluation of the scales used in the study and causal inferences cannot be made.

Conclusions
This study determined that the health literacy level of preservice primary school teachers was sufficient and their COVID-19 awareness level was moderate. Compulsory courses on these topics could be added to the curriculum to raise awareness of COVID-19 and increase health literacy levels among preservice teachers. This study found that health literacy in preservice teachers was affected by gender, grade/year (freshman to senior), having contracted COVID-19, and having a chronic disease, and that COVID-19 awareness was affected by gender, age, grade/year, having contracted COVID-19, and being vaccinated against COVID-19. The factors affecting these parameters should be taken into consideration when planning the interventions to improve the health literacy and COVID-19 awareness of preservice teachers. This study found that CAS Contagion Precaution Awareness and Awareness of Following Current Developments are key variables in predicting health literacy levels. Studies that will increase preservice teachers’ COVID-19 awareness should be planned, and it should be considered that these studies will also contribute positively to health literacy.

IMPLICATIONS FOR SCHOOL HEALTH
Teachers are the basis of health literacy for primary school children. In addition, teachers are expected to fulfill the requirement of informing children about hand hygiene, mask use, social distancing, and immunization in school settings during the current pandemic. For this reason, preservice primary school teachers must have high levels of health literacy and COVID-19 awareness. In our study, we found that preservice primary school teachers have sufficient levels of health literacy but moderate levels of COVID-19 awareness. To maximize these 2 parameters, content on health literacy, COVID-19 and current diseases that have the potential to affect society can be added to the curriculum of preservice primary school teachers during their undergraduate study. In the future, experimental studies with interventions that can positively affect primary school teachers’ health literacy and COVID-19 awareness levels can be planned.

Human Subjects’ Approval Statement
Approval was obtained from the ethics committee of Ankara University to carry out the research (Date: 02/08/2021 No: 11-135). After the ethics committee approval, institutional permission was obtained from the 4 universities where the research was conducted.

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