Health literacy levels vary from medium to low worldwide. In the United States, the percentage of adults with sufficient health literacy has been around 12% for at least the past decade (Goodman et al., 2013). In a 2015 study conducted in eight European countries (Austria, Bulgaria, Germany, Greece, Ireland, Netherlands, Poland, and Spain), 12% of respondents showed insufficient health literacy and 47% showed inadequate or limited health literacy (Sørensen et al., 2015). According to the findings of a study conducted in several Asian countries (Indonesia, Kazakhstan, Malaysia, Myanmar, Taiwan, and Vietnam), “problem-limited” was the most prevalent level of health literacy found, and the distribution of health literacy rates was similar across all of these countries (Duong et al., 2017). In Turkey, 64.6% of the general adult population was found to have inadequate or limited health literacy levels (Ozkan, 2018).

Although health literacy is an important issue affecting all of society, particular attention should be given to women. Women with higher levels of health literacy are better able to notice health problems, access healthcare in a timely
manner, provide recommended treatments, and follow up on healthcare situations (Tehrani et al., 2018). In addition, women are one of the most sensitive and vulnerable groups in society because their maternal physiology threatens them with many risks and diseases. As women play an important role in maintaining and improving their own health as well as the health of their families, they are in a good position to positively influence the health of society at large. Therefore, the health literacy level of women affects not only themselves but also their children and families (Rakhshkhorshid & Sarasiyabi, 2017; Tehrani et al., 2018).

Health literacy is a complex issue that affects many women and may negatively affect their knowledge, ability to comply with healthcare plans and disease-prevention activities, and health outcomes for themselves and their children (Corrarino, 2013; Tehrani et al., 2018). Health literacy affects reproductive health services that target women. Information about contraception, safe sexual practices, healthy pregnancies, and postpartum preventive care is important to help women maintain their health and lead productive lives (Kilfoyle et al., 2016). Making informed decisions that lead to better health outcomes for themselves and their families is difficult for women in the absence of sufficient health-related knowledge. Therefore, health literacy is an important factor affecting a woman’s ability to understand, process, and act on health-related information (Rakhshkhorshid & Sarasiyabi, 2017). Increasing the literacy rate of women may lead to improved health and reductions in the rates of illness and death (Tehrani et al., 2018). Therefore, more attention should be given to increasing health literacy in women. Nurses play a vital role in promoting health literacy, as they are the members of a profession that communicates and interacts actively with society and individuals (Loan et al., 2018).

Interventions designed to increase health literacy typically include written educational materials prepared at an appropriate reading level that are designed to increase health knowledge, self-efficacy, and self-advocacy skills using clear communication, training, and counseling (Ayaz-Alkaya et al., 2020; Shieh et al., 2009). Determining a woman’s health literacy is the first step toward improving this level (Corrarino, 2013). Studies in the literature that have investigated health literacy in women have measured health literacy using a single national or international instrument such as the Test of Functional Health Literacy in Adults (Maricic et al., 2020), Rapid Estimate of Adult Literacy in Medicine Revised (Jarahi et al., 2017), European Health Literacy Survey Questionnaire (Huang et al., 2020), and Iranian Health Literacy Questionnaire (Rakhshkhorshid & Sarasiyabi, 2017, Tehrani et al., 2018). In this study, health literacy level was evaluated using two scales. One of these scales was developed specifically for Turkish adults, and the other was adapted to Turkish culture from a different culture. This study differs from other studies in terms of its use of two different scales to assess health literacy in women, which enhances the sensitivity of the subsequent analysis and strengthens the validity of the findings.

This study was conducted to determine the health literacy and related factors of Turkish women attending courses at family centers in a municipality. The research questions were the following:

- What is the health literacy level of the participants?
- Do sociodemographic variables affect health literacy?
- Do visual and hearing problems affect health literacy?
- Does internet use affect health literacy?

### Methods

#### Design and Participants

This was a cross-sectional research. The sample consisted of women enrolled in various courses at eight family centers in a metropolitan area (N = 1,100), who were presumed to be representative of adult women living in metropolitan areas in Turkey. The national employment rate of women in Turkey (29.1%; Turkish Statistical Institute, 2020) was similar to the rate in the city where this study was conducted. Unemployed women attend courses at family centers in preparation for seeking employment to contribute to family income and to make efficient use of their free time. Typical courses offered at family centers include knitting, dyeing, painting, jewelry design, computer, and skin care. Women may attend only one course at a time. The participants reside in the region where the family centers are located and share similar socioeconomic and cultural characteristics to others living in the same region. Any woman over the age of 18 years is eligible to register for family center courses. The sample consisted of the 837 women in these centers who agreed to participate. The participation rate was 76%.

Inclusion criteria were as follows: (a) aged 18–74 years, (b) currently registered for a course at a family center, and (c) agreed to participate in the research. Exclusion criteria were as follows: (a) over 74 years old and (b) having any neuropsychiatric disease.

#### Instruments

Data were collected using a personal information datasheet, the Turkish Health Literacy Scale-32 (THLS-32; developed for use in multiple cultural settings and later adapted for use in Turkey), and the Adult Health Literacy Scale (AHLS; developed specifically for use in Turkish populations). The use of more than one health literacy scale in this study was intended to increase the sensitivity of results.

The personal information datasheet was developed based on the literature (Ayaz-Alkaya & Terzi, 2019; Huang et al., 2020; Maricic et al., 2020) and consisted of closed-ended questions covering respondent age, educational level, working status, income level, social security, presence of chronic disease (diabetes, hypertension, heart failure, asthma, and hyperthyroidism), drug use, visual problems (myopia, hyperopia, blurred vision, dry eye, and wearing glasses), hearing problems (presbycusis and hearing impairment), and internet use.
The THLS-32 was developed by the European Health Literacy Research Consortium in 2012 (HLS-EU Consortium, 2012). The THLS-32 consists of 32 questions that evaluate the two dimensions of disease prevention and health promotion. The THLS-32 is scored using a 5-point Likert scale (1 = very easy, 2 = easy, 3 = hard, 4 = very hard, and 5 = no idea). The indexes were standardized with the help of the formula \[\text{index} = \frac{\text{average} - 1}{50}/3\] to generate a value range between 0 and 50. The obtained score is classified into four categories. Health literacy level scores of 0–25 points indicate inadequate health literacy, 26–33 points indicate limited health literacy, 34–42 points indicate adequate health literacy, and 43–50 points indicate excellent health literacy. The validity and reliability of this scale were tested by Okyay and Abacigil (2016), and its construct validity was examined using basic components (extraction method: principal components). Kaiser–Meyer–Olkin (KMO) value in evaluating the adequacy of sample size was found to be 0.90. The significance of the Bartlett’s test results (\(\chi^2 = 5206.808\), SD = 496, \(p < .001\)) supports the factor analysis. To test the reliability of the scale, internal consistency (Cronbach’s alpha) analysis was conducted, with a Cronbach’s alpha coefficient of .93 found. In this study, the Cronbach’s alpha of the scale was found to be .95.

The AHLS was developed by Sezer and Kadioğlu (2014) to assess health-literacy competency in adults. This scale includes 22 items related to health information and drug use, and one figure used to assess knowledge of the location of organs in the body. Among the questions in the scale, 13 are yes/no, four are fill in the blanks, four are multiple-choice, and two are matching questions. The questions are scored separately according to question type. Total possible scores for this scale range from 0 to 23, with higher scores indicating a higher level of health literacy. The content and construct validities of this scale were examined, with the general content validity index found to be 90.71%. KMO criteria and Bartlett’s test were used to test the construct validity of the scale using factor analysis. The KMO coefficient of .71 and Bartlett’s test result of \(p < .01\) indicate that the sample size used was sufficient for factor analysis. The Cronbach’s alpha coefficient for the AHLS was .77. In this study, the Cronbach’s alpha of the scale was found to be .73.

Data Collection
Research for this study was carried out between April 15, 2019, and May 15, 2019. Before data collection, the researcher informed the managers of the targeted family centers about the research. The researcher, with the managers, explained the research to the women who were attending courses at the family centers. Informed consent was obtained from each woman who agreed to participate. The women were informed that participation in this study was voluntary and that they could withdraw without prejudice at any time. Those who agreed to participate were given the study instruments in a sealed envelope. The researcher supervised the completion and collection of these instruments. Data collection lasted approximately 20–25 minutes.

Ethical Considerations
Before data collection, ethical approval was obtained from Ankara University (Date: April 8, 2019, No. 09/157), and written permission was given by the Provincial Directorate of National Education. Written consent from each participant was obtained after reading the informed consent form.

Data Analysis
Data analysis was performed using SPSS Statistics Version 15.0 (SPSS Inc., Chicago, IL, USA). The distribution of data was evaluated using the Kolmogrov-Smirnov normality test. Descriptive variables were expressed as frequencies, percentages, mean, and standard deviation. Categorical data were compared using the chi-square test. Independent \(t\) tests were used in two groups, which had continuous variables, and one-way analysis of variance was used for more than two groups.

Results
Half (50.4%) of the participants were over 40 years old, 35.2% were high school graduates, 89.6% were not working, 53.2% stated that their monthly income was equal to expenses, 88.8% had social security, 28.4% had chronic diseases, 29.2% used medication regularly, 35.2% had visual problems, 7.8% had hearing problems, and 77.9% regularly used the internet (Table 1). The results from the THLS-32 showed that 45.9% of the participants were in the inadequate category, 30.6% were in the limited category, 16% were in the adequate category, and 7.4% were in the excellent category of health literacy.

In addition, on the basis of the THLS-32 results, being ≥40 years old, having an elementary school education, having visual and hearing problems, and using eyewear significantly increased the risk of being in the lower (inadequate and limited) categories of health literacy (\(p < .05\)). Furthermore, participants who were employed, had a monthly income in excess of expenses, had social security, had a chronic disease, or used the internet were significantly more likely to be in the higher (adequate and excellent) categories of health literacy (\(p < .05\); Table 2).

On the basis of the AHLS results, being ≥40 years old, having an elementary school education, having visual and hearing problems, using eyewear, having a monthly income less than expenses, and not using the internet were each significantly associated with a lower health literacy score (\(p < .05\); Table 3).

Discussion
Health literacy refers to the skills and competencies necessary to meet the complex requirements of health in modern society (Maricic et al., 2020). Health literacy is important because it affects not only women as the primary caregiver but
also the family’s health (Yuen et al., 2018). In this study, most of the participants scored in the inadequate or limited category of health literacy. Similarly, Huang et al. (2020) found most respondents to have inadequate (17.6%) or limited (49.3%) health literacy. The results of a meta-analysis study conducted by Charoghchian Khorasani et al. (2020) found that 31.7% of women had inadequate health literacy and 41.6% had marginal health literacy. Wang et al. (2015) reported that 51.0% of women of reproductive age had inadequate health literacy. The results of this study seem to be comparable with these and other findings reported in the literature. Women are key to maintaining and improving the health of both the community and the family. Therefore, increasing women’s health literacy levels is vital.

Age, income, occupation, and education have all been reported to be associated with health literacy in previous studies (Huang et al., 2020; Rakhshkhorshid & Sarasiyabi, 2017; Tehrani et al., 2018). In this study, on the basis of both the results of the THLS-32 and AHLS, it was determined that

### Table 1
Descriptive Characteristics of the Women (N = 837)

| Descriptive Characteristic      | n   | %   |
|---------------------------------|-----|-----|
| Age (years)                     |     |     |
| 18–39                           | 415 | 49.6|
| ≥ 40                            | 422 | 50.4|
| Educational level               |     |     |
| Primary school                  | 250 | 29.9|
| Secondary school                | 171 | 20.4|
| High school                     | 295 | 35.2|
| University                      | 121 | 14.5|
| Working                         |     |     |
| Yes                             | 87  | 10.4|
| No                              | 750 | 89.6|
| Income                          |     |     |
| Less than expense               | 323 | 38.6|
| Equal to expense                | 445 | 53.2|
| More than expense               | 69  | 8.2 |
| Social security                 |     |     |
| Yes                             | 738 | 88.2|
| No                              | 99  | 11.8|
| Having any chronic disease      |     |     |
| Yes                             | 238 | 28.4|
| No                              | 599 | 71.6|
| Regular medication usage        |     |     |
| Yes                             | 244 | 29.2|
| No                              | 593 | 70.8|
| Visual problems                 |     |     |
| Yes                             | 295 | 35.2|
| No                              | 542 | 64.8|
| Wearing glasses                 |     |     |
| Yes                             | 295 | 35.2|
| No                              | 542 | 64.8|
| Hearing problems                |     |     |
| Yes                             | 65  | 7.8 |
| No                              | 772 | 92.2|
| Internet use                    |     |     |
| Yes                             | 652 | 77.9|
| No                              | 185 | 22.1|

### Table 2
Factors Related to Health Literacy Levels Based on Turkish Health Literacy Scale-32 Results (N = 837)

| Factor                                    | Inadequate and Limited | Adequate and Excellent | p   |
|-------------------------------------------|------------------------|------------------------|-----|
| Age (years)                               |                        |                        | .001|   |
| 18–39                                     | 297 (71.6)             | 118 (28.4)             |     |
| ≥ 40                                      | 343 (81.3)             | 79 (18.7)              |     |
| Educational level                         |                        |                        | .001|   |
| Primary school                            | 208 (83.2)             | 42 (16.8)              |     |
| Secondary school                          | 135 (78.9)             | 36 (21.1)              |     |
| High school                               | 217 (73.6)             | 78 (26.4)              |     |
| University                                | 80 (66.1)              | 41 (33.9)              |     |
| Working                                   |                        |                        | .011|   |
| Yes                                       | 57 (65.5)              | 30 (34.5)              |     |
| No                                        | 583 (77.7)             | 167 (22.3)             |     |
| Income                                    |                        |                        | .009|   |
| Less than expense                         | 260 (80.5)             | 63 (19.5)              |     |
| Equal to expense                          | 336 (75.5)             | 109 (24.5)             |     |
| More than expense                         | 44 (63.8)              | 25 (36.2)              |     |
| Social security                           |                        |                        | .036|   |
| Yes                                       | 556 (75.3)             | 182 (24.7)             |     |
| No                                        | 84 (84.8)              | 15 (15.2)              |     |
| Having any chronic disease                |                        |                        | .019|   |
| Yes                                       | 169 (71.0)             | 69 (29.0)              |     |
| No                                        | 471 (78.6)             | 128 (21.4)             |     |
| Regular medication usage                  |                        |                        | .124|   |
| Yes                                       | 178 (73.0)             | 66 (27.0)              |     |
| No                                        | 462 (77.9)             | 131 (22.1)             |     |
| Visual problems                           |                        |                        | .002|   |
| Yes                                       | 244 (82.7)             | 51 (17.3)              |     |
| No                                        | 396 (73.1)             | 146 (26.9)             |     |
| Wearing glasses                           |                        |                        | .005|   |
| Yes                                       | 242 (82.0)             | 53 (18.0)              |     |
| No                                        | 398 (73.4)             | 144 (26.6)             |     |
| Hearing problems                          |                        |                        | .026|   |
| Yes                                       | 57 (87.7)              | 8 (12.3)               |     |
| No                                        | 583 (75.5)             | 189 (24.5)             |     |
| Internet use                              |                        |                        | < .001| |
| Yes                                       | 477 (73.2)             | 175 (26.8)             |     |
| No                                        | 163 (88.1)             | 22 (11.9)              |     |
the participants who were 40 years old and over, were elementary school graduates, and earned an income below their expenses were significantly more likely to be in the inadequate and limited categories of health literacy. In addition, the results of the THLS-32 indicate that the participants who were employed had a higher likelihood of being in the adequate category of health literacy. Consistent with this study, Huang et al. (2020) showed a relationship in the women’s cohort between low health literacy and the variables low socioeconomic level, low educational level, and increasing age. Rakshikhorshid and Sarasyabi (2017) found a significant relationship between health literacy and age. In the same study, they also showed that even educated people with more than 12 years of education lacked sufficient health literacy and that employed women had higher health literacy than housewives or unemployed women. Tehrani et al. (2018) found that the level of health literacy in almost half of their sample of women was not adequate and that those who were employed had better health literacy than housewives. This body of evidence supports that level of health literacy decreases as women get older and increases with educational and income levels. Increasing education is important to increasing the level of health literacy because better-educated individuals are better able to obtain the information necessary to address health problems. In addition, the higher level of health literacy found in working women may be explained by their generally higher level of education and better social support network than housewives. Therefore, the education and income levels of women should be increased. Employment increases income levels leading to higher health literacy. Women should be informed about health literacy from an early age to increase their health literacy.

Health literacy plays a crucial role in the management of chronic diseases. The ability to participate in self-management is compromised when a patient is unable to fully comprehend their diagnosis and treatment (Poureslami et al., 2017). In this study, the health literacy level of women with chronic diseases was adequate to excellent according to the THLS-32. This finding may be explained by the efforts of women with chronic diseases to obtain more information to manage their chronic diseases and to be healthier. Chronic diseases are complex conditions that require knowledge and skills to manage effectively. Similarly, Liu et al. (2020) highlighted the important role of health literacy in preventing chronic diseases. Improved health literacy has been associated with reductions in chronic-disease-related risk behaviors, higher self-reported health status, and decreased rates of hospitalization (Poureslami et al., 2017).

Health literacy level affects healthcare use and healthcare outcomes in people with visual and hearing impairments (T. Harrison et al., 2012; McKee et al., 2019). Individuals with hearing or visual difficulties or disabilities face important obstacles in accessing health services, which leads to inequalities. Although various causes of these inequalities, including poor health literacy and biological health differences (related to deafness etiologies), have been identified, communication barriers represent the main factor (Withers & Speight, 2017). Many users of American Sign Language learn language, health information, and even culture through their peers rather than family, causing them to struggle to detect and correct wrong information. Because of the environment in which communication is exchanged, insufficient health literacy may be an important cause of the low health information and worse health outcomes observed in deaf individuals (McKee et al., 2019). Visually impaired people with low levels of health literacy were found to be less likely to follow healthcare recommendations than their peers with higher health literacy levels (T. Harrison et al., 2012). In this study, the health literacy level of women with visual and hearing problems and of those who wear glasses was inadequate or limited based on the results of both

### Table 3
Factors Related to Health Literacy Levels According to the Adult Health Literacy Scale (N = 837)

| Factor                        | n   | Mean | SD  | p    |
|-------------------------------|-----|------|-----|------|
| Age (years)                   |     |      |     |      |
| 18–39                         | 415 | 12.47| 3.69| < .001 |
| ≥ 40                          | 422 | 11.09| 4.06|       |
| Educational level             |     |      |     | < .001 |
| Primary school                | 250 | 9.87 | 3.95|       |
| Secondary school              | 171 | 11.05| 3.61|       |
| High school                   | 295 | 13.00| 3.41|       |
| University                    | 121 | 13.73| 3.58|       |
| Working                       |     |      |     | .094  |
| Yes                           | 87  | 12.44| 3.53|       |
| No                            | 750 | 11.70| 3.98|       |
| Income                        |     |      |     | < .001 |
| Less than expense             | 323 | 10.82| 4.21|       |
| Equal to expense              | 445 | 12.51| 3.55|       |
| More than expense             | 69  | 11.46| 4.06|       |
| Social security               |     |      |     | .623  |
| Yes                           | 738 | 11.80| 3.96|       |
| No                            | 99  | 11.59| 3.75|       |
| Having any chronic disease    |     |      |     | .433  |
| Yes                           | 238 | 11.60| 4.40|       |
| No                            | 599 | 11.84| 3.74|       |
| Regular medication usage      |     |      |     | .159  |
| Yes                           | 244 | 11.47| 4.42|       |
| No                            | 593 | 11.90| 3.72|       |
| Visual problems               |     |      |     | .009  |
| Yes                           | 295 | 11.29| 4.20|       |
| No                            | 542 | 12.04| 3.76|       |
| Wearing glasses               |     |      |     | .032  |
| Yes                           | 295 | 11.38| 4.16|       |
| No                            | 542 | 11.99| 3.80|       |
| Hearing problems              |     |      |     | .037  |
| Yes                           | 65  | 10.80| 4.25|       |
| No                            | 772 | 11.86| 3.90|       |
| Internet use                  |     |      |     | < .001 |
| Yes                           | 652 | 12.48| 3.54|       |
| No                            | 185 | 9.30 | 4.26|       |
women with visual impairments stated that barriers to their ability to gain information in a format amenable to their processing skills undermined their ability to build health literacy capacity. McKee et al. (2015) found that 48% of deaf participants had inadequate health literacy and that deaf individuals were 6.9 times more likely than hearing participants to have inadequate health literacy. Thus, barriers to accessing health information should be identified, and best practices should be planned to increase the health literacy of women with visual and hearing problems.

Information and communication technologies are widely used to provide health services to communities. Internet usage helps promote health literacy (Jiang & Beaudoin, 2016; Kim & Xie, 2015). In this study, the participants who did not use the internet were found to have inadequate and limited levels of health literacy based on the results of both the THLS-32 and AHLS. Similarly, there is evidence that individuals with low health literacy experience difficulties in effectively using and interacting with technologies in healthcare settings (Kim & Xie, 2015). In Jiang and Beaudoin (2016), using the internet was identified as a factor that contributes positively to health literacy. Women who use the internet should be better able to access health information and assess services for health-related issues than their peers who do not. Health-related internet use helps people build health literacy. For this reason, women should be encouraged to use the internet to increase their health literacy level.

**Strengths and Limitations**

The strengths of this study included the use of a large, randomly selected sample and the application of locally and internationally developed scales with good reliability. However, the study has several limitations. The results may only be generalized to women enrolled and attending courses at the family centers where the study was conducted. Moreover, data collection was limited to women who were present in courses at the centers on the day of data collection and who agreed to participate. Therefore, the findings should not be generalized to the whole population. Finally, the cross-sectional design of this study did not allow causal inferences to be made.

**Conclusions**

In this study, the health literacy of most of the participants was at the low-insufficient level. Therefore, special efforts should be made to increase women’s health literacy, which affects not only their personal health but also the health of their families. Strategies such as effective communication, development of health education materials, increasing educational opportunities, and promotion of internet use may be used to increase the level of health literacy in women. Factors such as age, educational level, income, visual and hearing problems, need to wear glasses, and internet use were found to affect the level of health literacy. Therefore, these factors should be considered when planning initiatives to increase health literacy in women. Intervenational studies designed to increase the health literacy of women should be planned and implemented in future research.

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**Author Contributions**

Study conception and design: SAA, FOO
Data collection: FOO
Data analysis and interpretation: SAA
Drafting of the article: SAA, FOO
Critical revision of the article: SAA, FOO

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