

ORIGINAL ARTICLE / ORJİNAL MAKALE

## The Effect of Health Literacy in Women on Their Level Of Knowledge About Cardiovascular Disease Risk Factors and Their Risk of Diabetes

Kadınlarda Sağlık Okuryazarlığının Kardiyovasküler Hastalık Risk Faktörleri Bilgi Düzeyi ve Diyabet Riskine Etkisi



Nurten Timur Doğan<sup>1</sup>,



Hatice Serap Koçak<sup>2</sup>

<sup>1</sup> MSc, 25 Aralık Hospital, Gaziantep, Türkiye

<sup>2</sup> PhD, Gaziantep University, Faculty of Health Sciences, Department of Public Health Nursing, Gaziantep, Türkiye

Received: 05.09.2022, Accepted: 03.08.2024

### Abstract

**Background:** Health literacy is important not only for reading efficiency but also for early diagnosis of diseases and risk awareness.

**Objective:** This study was conducted to determine the effect of health literacy on the level of knowledge of women regarding cardiovascular disease risk factors and their risk of developing diabetes.

**Methods:** The study employs a cross-sectional design. The research sample consists of 300 women. The data was collected by face-to-face survey method between January and July 2021. A Personal Information Form, the Turkish Health Literacy Scale-32 (THLS-32), the Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale and the Finnish Diabetes Risk Score (FINDRISC) Questionnaire were used in the study. Mann-Whitney U test and Kruskal-Wallis test were used to evaluate the data.

**Results:** It was determined that one third of the women had inadequate THLS-32 scores and that their mean CARRF-KL and FINDRISC scores were moderate. The mean THLS-32 scale scores of those with a low education level and poor health perception were found to be lower ( $p < .05$ ).

**Conclusion:** It is determined that the women's THLS-32 score is at a problematic – limited level. Providing health literacy knowledge to women has the potential to positively affect the overall health level of the society.

**Keywords:** Cardiovascular Disease Risk Factor, Diabetes Risk, Health Literacy, Nursing

**Corresponding Author:** Hatice Serap KOÇAK, PhD, Gaziantep University, Faculty of Health Sciences, Department of Public Health Nursing, Gaziantep, Türkiye. **Email:** stasdemirmeister@gmail.com

**Cite This Article:** Timur Doğan N, Koçak HS. The Effect of Health Literacy in Women on Their Level Of Knowledge About Cardiovascular Disease Risk Factors and Their Risk of Diabetest. 2024;17(3): 537-548

*Journal of Nursing Effect published by Cetus Publishing.*



*Journal of Nursing Effect 2024 Open Access. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License*

**Öz**

**Giriş:** Sağlık okuryazarlığı sadece okuma verimliliği için değil, aynı zamanda hastalıkların erken teşhisi ve risklerin bilinmesi için de önemlidir.

**Amaç:** Bu araştırma, kadınlarda sağlık okuryazarlığının kardiyovasküler hastalık risk faktörleri bilgi düzeyi ve diyabet riskine etkisini belirlemek amacıyla yapıldı.

**Yöntem:** Çalışma kesitsel tiptedir. Araştırma örneklemini 300 kadından oluşmaktadır. Veriler ocak ve temmuz 2021 tarihleri arasında yüz yüze anket yöntemi ile toplandı. Çalışmada Kişisel Bilgi Formu ve Türk Sağlık Okuryazarlığı Ölçeği-32 (THLS-32), Kardiyovasküler Hastalık Risk Faktörleri Bilgi Düzeyi (CARRF-KL) Ölçeği ve Finlandiya Diyabet Risk Skoru (FINDRISC) Anketi kullanıldı. Verilerin değerlendirilmesinde Mann-Whitney U testi ve Kruskal-Wallis testi kullanıldı.

**Bulgular:** Kadınların üçte birinin THLS-32 puanlarının yetersiz olduğu, ortalama CARRF-KL ve FINDRISC puanlarının orta düzeyde olduğu belirlendi. Eğitim düzeyi düşük ve sağlık algısı kötü olanların THLS-32 ölçeği puan ortalamalarının daha düşük olduğu bulundu ( $p<.05$ ).

**Sonuç:** Kadınların THLS-32 puanının sorunlu – sınırlı düzeyde olduğu belirlendi. Kadınların sağlık okuryazarlığı konusunda bilgilendirilmesinin tüm toplumun sağlık düzeyini olumlu yönde etkileyeceği düşünülmektedir.

**Anahtar Kelimeler:** Kardiyovasküler Hastalık Risk Faktörü, Diyabet Riski, Sağlık Okuryazarlığı, Hemşirelik

**INTRODUCTION**

Health literacy (HL) is a concept that has an effect on health protection, health education and health communication (Aras & Temel Bayık, 2017). According to the World Health Organization (WHO, 1998), health literacy is expressed as “the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health” (Aydın & Aba, 2019). HL is not only a matter of reading; it encompasses the ability to access health services without having to visit a hospital, obtain an appointment, understand the medical terminology and sentences formed by the doctor, use medicines correctly, and to be able to manage all of these systems (Uğurlu & Akgün, 2019). Since it enables the correct use of health services by all individuals, HL is an

important skill (Durusu Tanrıöver et al., 2014). It was agreed at the 62nd session of the WHO that HL is an important dimension of health policies; it was stated that the participation of the whole of society in initiatives related to the improvement and development of individuals’ health will produce effective and important results (Deniz et al., 2018).

Insufficient HL knowledge affects most areas of life and is influenced by individuals’ social, cultural and economic factors (Durusu Tanrıöver et al., 2014). Low HL is associated with the inability to use preventive health services, to understand that the individual’s state of health is not good, to comply with medical recommendations, and to perform self-care, the occurrence of delays in seeking and using health services, and increases in health expenditures and mortality rates (Ağralı & Akyar, 2018).

Inadequate HL causes many problems such as failures in chronic disease management, increase in hospitalisations, and inability to use health services properly (Durusu Tanrıöver et al., 2014). In light of this information, it becomes evident that diabetes and cardiovascular diseases (CVD), which are among the common chronic diseases that can be prevented or controlled, are highly correlated with HL.

If diabetes and CVD are expressed in general, they can be thought of as two sides of a medallion. CVD is more common in individuals with diabetes, and the risk of death in diabetics with cardiovascular diseases has been found to increase at a similar rate compared to those without diabetes. In studies conducted on people with type 2 diabetes, it was determined that the development of cardiovascular disease can be reduced with healthy lifestyle changes (Taşkın Yılmaz et al., 2018). People's health literacy is effective in developing a healthy lifestyle. HL has a greater effect on the elderly, those with chronic diseases, and especially women. Women's knowledge about health is a very important factor for good health in the generations they will raise and for the prevention of negative health consequences (Aydın & Aba, 2019). Low HL has a negative impact on women's health, which can affect both themselves and their children and families (Vural Aktan & Özdemir, 2020). Increasing women's HL level will bring about differences in the health level of the whole of society (Aydın & Aba, 2019). An inadequate level of HL can be seen to cause insufficient use of preventive health services, failure to recognise disease when early diagnosis should be made, inability to make the right choice for his health, failure to follow medical advice and directives, inadequate self-care, and an increase in health expenditures and mortality rates. (Yıldırım &

Keser, 2015). HL is very important for a healthy society and developing health system, and it should be an important area in a nation's health policies (Durusu Tanrıöver et al., 2014).

### *Aim*

This study aims to determine the effect of health literacy on the knowledge level of cardiovascular disease risk factors and diabetes risk in women.

### *Research questions*

1. What is the level of women's health literacy, knowledge of cardiovascular disease risk factors, and diabetes risks?
2. Do women's sociodemographic characteristics affect health literacy, knowledge of cardiovascular disease risk factors, and diabetes risk?

## **METHOD**

### *Type of the Research*

The study used a cross-sectional design.

### *Place of the Research*

The population of the research consists of 198 Family Health Centers located in Gaziantep province. Lots were drawn to determine the Family Health Centres where the research was to be conducted, and three centres were specified.

### *Universe/Sample of the Research*

The sample of the study consisted of women who applied to the Family Health Centres between January and July 2021 for any reason and who met the inclusion criteria of the study. Women over the age of 18, who did not have any chronic diseases or communication problems, and who agreed to participate in the study after being informed were included in the study. Those who had communication problems that prevented them from responding to the questionnaire and who did not agree to be included in the study were excluded from the study. Power analysis

was performed to determine the sample size, which was determined as 254. During the data collection phase, 300 women were contacted ( $\alpha=0.05$ ,  $1-\beta=0.80$ , effect size ( $w$ )=0.30) (Çürük et al., 2018). It was determined that the sample size was the same in the post hoc power analysis performed after the research was completed.

### *Data Collection Instrument-Validity and reliability information*

Data were collected via face-to-face interviews with the women. A “Personal Information Form”, and the “Turkey Health Literacy Scale-32 (THLS-32)”, the “Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale” and the “Finnish Diabetes Risk Score (FINDRISC) Questionnaire” were used to collect data.

#### *Personal Information Form*

The form includes 18 questions prepared by using the literature knowledge on the demographic characteristics and certain habits of the participants (Uğurlu & Akgün, 2019; Bayık Temel & Çimen, 2017).

#### *Turkey Health Literacy Scale-32 (THLS-32)*

The THLS-32 scale was developed by Okyay et al. (2016). This is a 32-item Likert-type assessment scale developed on the basis of the HLS-EU study. The matrix consists of eight components: two dimensions and four processes. Each item is rated as “very easy”, “easy”, “difficult”, “very difficult”, and “I have no idea”. A minimum of zero and a maximum of fifty points can be obtained from the THLS-32 scale. As the score increases, the level of health literacy increases. Health literacy categories are grouped as 0-25 points for inadequate health literacy, >25-33 points for problematic-limited health literacy, >33-42 points for adequate health literacy, and >42-50 points for excellent health literacy. Regarding the reliability of the

THLS-32 scale in Turkish, the Cronbach Alpha consistency coefficient was determined as 0.927 (Okyay & Abacıgil, 2016), while in our study, this value was calculated as 0.970.

#### *Cardiovascular Disease Risk Factors Knowledge Level (CARRF-KL) Scale*

The scale was developed by Arıkan et al. (2009), who carried out the validity and reliability study. The CARRF-KL scale consists of 28 items. The first four items of the scale inquire about the characteristics, preventability and age factor of CVDs, 15 items ask about the risk factors, and nine items inquire about the results of changes in risk behaviours. The items in the scale are presented to participants in the form of a complete sentence that can be correct or incorrect, and participants are asked to answer these statements as “Yes”, “No” or “I don’t know”. For each correct answer 1 point is given. In order to prevent the effect of the “I don’t know” statement in the evaluation, this response is regarded as “incorrect”. The scores that can be obtained from the scale range from 0 to 28. As the scores increase, the level of knowledge increases (Arıkan et al., 2009). The Cronbach’s alpha coefficient of the CARRF-KL scale was calculated as 0.76 (2), and this was found to be 0.855 in our study.

#### *Finnish Diabetes Risk Score (FINDRISC) Questionnaire*

The FINDRISC, which is one of the tools for assessing the risk of type 2 diabetes in adults, was developed in Finland in 2003. The FINDRISC is a scale accepted and used by the Turkish Endocrinology and Metabolism Society (TEMS). The FINDRISC consists of eight questions, and each question has a different weight. It enables a prediction of an individual’s risk of developing diabetes in the next 10 years. The highest score that can be obtained from the scale is 26. With a score of 15 and above, the risk increases, and

in this case, it is recommended that people be included in a prevention programme (TEMS, 2020).

### Evaluation of the Data

The IBM SPSS version 21.0 was used for statistical analysis. The conformity of the data to normal distribution was evaluated with the Shapiro-Wilk test. In terms of descriptive statistics, mean±standard deviation was given for numerical variables, while number and percentage values were given for categorical variables. Data were evaluated using the Mann-Whitney U test and Kruskal-Wallis test coefficient. Cronbach's alpha coefficients were calculated to test validity and reliability.

### Variables of the Research

Independent variables: socio-demographic variables of the participants.

Dependent variables: scores from the THLS-32, FINDRISC, and CARRF-KL scales.

### Ethical Aspect of the Research

Before beginning the research, permission was obtained from a provincial health directorate, a university's medical faculty ethics committee (ethics approval number:2020/110), and the Family Health Centres, while permission to use the scale employed in the study was obtained from the researchers who conducted the validity and reliability study scale. In order to protect the rights of individuals throughout the study, the participants were informed before the study data were collected, and their informed consent was obtained within the scope of the principle of volunteering.

## RESULTS

Findings regarding some socio-demographic characteristics and habits of the women included in this study are given in Table 1. In our study, the

THLS-32 scale mean index score of the women was  $28.48 \pm 11.02$ , their CARRF-KL scale mean score was  $16.77 \pm 4.46$ , and their FINDRISC mean score was  $13.93 \pm 3.63$ . It was found that 33.0% of the women had inadequate health literacy levels (Table 2).

**Table 1.** Distribution of Women's Socio-Demographical Characteristics (n=300)

Features	n	%
<b>Marital status</b>		
Married	202	67.3
Single	98	32.7
<b>Education</b>		
Illiterate	28	9.3
Literate	13	4.3
Primary School	87	29.0
Middle School	43	14.4
High School	57	19.0
University	72	24.0
<b>Profession</b>		
Housewife	188	62.7
Working	112	37.3
<b>Income and Expenditure Balance</b>		
Income more than expenses	45	15.0
Equal income and expenditure	159	53.0
Income missing from expenses	96	32.0
<b>General Health Perception</b>		
Bad	17	5.7
Middle	124	41.3
Good	143	47.7
Very good	16	5.3
<b>Health insurance</b>		
No	27	9.0
Had	273	91.0
<b>Smoking</b>		
No	242	80.7
Yes	58	19.3
<b>Reading</b>		
Never read	103	34.3
Sometimes	138	46.0
Often	59	19.7
<b>Receiving help with their reading-writing activities</b>		
Always	39	13.0
Sometimes	72	24.0
Rarely	44	14.7
Never	145	48.3
<b>Doing exercise</b>		
No	117	39.0
Occasionally	158	52.7
All the time	25	8.3
<b>Did not add salt without tasting food</b>		
Yes	88	29.3
No	212	70.7
<b>Total</b>	<b>300</b>	<b>100.0</b>

**Table 2.** Distribution of THLS-32 Classification, TSOY-32, CARRF-KL and FINDRISC Scores

	n	%
<b>THLS-32 classification</b>		
(0-25) insufficient health literacy	99	33.0
(>25-33) problematic-limited health literacy	93	25.0
(>33-42) adequate health literacy	75	31.0
(>42-50) excellent health literacy	33	11.0
<b>Scale Score Average</b>	$\bar{X} \pm SD$	Min.-maks
THLS-32 Total	28.48±11.02	0-50
CARRF-KL Total	16.77±4.46	0-26
FINDRISC Total	13.93±3.63	9-24

Considering the THLS-32 total mean scores of the women in terms of their socio-demographic characteristics, a significant relationship with THLS-32 total mean scores was found for marital status, education level and general health perception ( $p < 0.05$ ). It was determined that there was a significant relationship between the different education levels of the participants and

their CARRF-KL total mean scores, and that the risk factors of illiterate individuals were lower than those with other education levels ( $p < 0.05$ ). It was observed that according to marital status, the FINDRISC scale score of the women was statistically significantly lower in single women compared to married ones ( $p < 0.05$ ). It was determined that as education level increased, FINDRISC scores statistically significantly decreased ( $p < 0.05$ ). It was determined that the FINDRISC mean score of those with poor general health perception was higher than that of the others, and that this was statistically significant ( $p < 0.05$ ) (Table 3). No significant relationship was found between the scale scores and the variables given in Table 1 profession, income and expenditure balance, health insurance, smoking, reading, getting help with reading-writing activities, doing exercise and did not add salt without tasting food.

**Table 3.** Comparison of the descriptive characteristics of women and the THLS-32 scale and total score averages (n=300)

Features	THLS-32		CARRF-KL		FINDRISC	
	Mean	Sd	mean	sd	mean	sd
<b>Marital status</b>						
Married	25.82	10.81	16.51	4.58	14.95	3.60
Single	33.92	9.36	17.29	4.17	11.82	2.66
p	<b>0.001</b>		0.192		0.001	
<b>Education levels</b>						
Not literate <sup>a</sup>	<sup>a</sup> 11.54	9.10	<sup>a</sup> 14.11	6.60	<sup>d</sup> 17.89	3.67
Literate <sup>b</sup>	<sup>b</sup> 24.62	8.54	<sup>b</sup> 18.23	3.63	<sup>c</sup> 15.54	4.84
primary school <sup>c</sup>	<sup>bc</sup> 23.23	9.83	<sup>b</sup> 16.43	3.56	<sup>c</sup> 15.70	3.14
middle school <sup>d</sup>	<sup>cd</sup> 30.06	6.52	<sup>b</sup> 16.42	4.63	<sup>ab</sup> 13.47	2.61
high school <sup>e</sup>	<sup>cd</sup> 32.47	6.66	<sup>b</sup> 16.63	4.53	<sup>ab</sup> 12.19	2.65
University <sup>f</sup>	<sup>d</sup> 37.76	6.51	<sup>b</sup> 18.26	3.88	<sup>a</sup> 11.60	2.52
p	<b>0.001</b> ( <sup>a&lt;b,c&lt;d,e&lt;f</sup> )		<b>0.007</b>		<b>0.001</b> ( <sup>f&lt;d,e&lt;c,b&lt;a</sup> )	
<b>General Health Perception</b>						
Bad <sup>a</sup>	<sup>a</sup> 19.45	8.79	17.59	3.61	<sup>c</sup> 18.24	4.58
Middle <sup>b</sup>	<sup>b</sup> 25.88	11.47	16.85	4.16	<sup>b</sup> 14.81	3.61
Good <sup>c</sup>	<sup>b</sup> 30.72	9.83	16.45	4.80	<sup>a</sup> 12.92	2.97
Very good <sup>d</sup>	<sup>c</sup> 37.97	7.22	18.00	4.32	<sup>a</sup> 11.50	2.61
p	<b>0.001</b> ( <sup>a&lt;b,c&lt;d</sup> )		<b>0.518</b>		<b>0.001</b> ( <sup>a&lt;b,e&lt;d</sup> )	

Different letters in the superscripts (a,b,c,d,e,f) indicate statistical significance. The p value was obtained from Kruskal Wallis and Mann Whitney U tests. sd: standard deviation

## DISCUSSION

Health literacy is defined as having the ability to access, comprehend, evaluate and apply information and to make decisions in order to promote health, maintain and improve well-being, and prevent health problems (Okyay & Abacıgil, 2016). In this study, it was determined that the participants' mean THLS-32 score was  $28.48 \pm 11.02$ , and that 33% of them had an inadequate THLS-32 score. Inadequacy of the HL level is an important problem all over the world. It has been determined that the level of HL is not at the desired level in more than half of the Austrian population, and that half of adults in the United States have difficulty in using health information (Uğurlu & Akgün, 2019). In a study conducted nationally, it was determined that 35.3% of women had insufficient health literacy (Turkey's health literacy level has been measured, 2020). In the European Health Literacy (HLS-EU) survey (2012), it was determined that the Netherlands had the highest mean level ( $37.1 \pm 6.4$ ), while Bulgaria had the lowest mean level ( $30.5 \pm 9.2$ ) (Deniz et al., 2018). When HL was evaluated in our study, it was seen that although the level was lower than the general average of Turkey, it was close to the average. People generally turn to health-seeking behaviour when their health deteriorates or when they have health-related problems in their family. The fact that our study group consisted of young women without any chronic disease may have led to this situation.

The WHO (2016) stated that 44.0% of 41 million deaths caused by chronic diseases occur due to cardiovascular disease (CVD). CVD ranks first among all causes of death in Turkey with 47.0% in 2017 (Efe Arslan & Kılıç Akça, 2020). The mean CARRF-KL score in this study was  $16.77 \pm 4.46$ . In two different studies, CARRF-

KL mean scores were determined as  $20.23 \pm 3.49$  and  $19.3 \pm 5.8$  (Arslan Efe & Kılıç Akça, 2020; Çürük et al., 2018). The fact that approximately four out of ten women in our study had primary school education or lower may have caused this result.

It has been shown that there is a strong relationship between type 2 diabetes and lifestyle, and that individuals with high risk can be identified at an early stage and prevented or delayed by 40-58% with a healthy lifestyle. The mean FINDRISC score in this study was  $13.93 \pm 3.63$ . This was  $7.46 \pm 4.62$  in the study by Coşansu et al. (2018) and  $7.6 \pm 4.1$  in the study by Koçak et al. (2017). Among the reasons why the FINDRISC mean score is higher in this study than in other studies may be the high number of participants who were married and housewives, since it can be thought that people who are married and are housewives generally have a more sedentary lifestyle and a higher risk of obesity. In a study carried out in Turkey in 2019, it was determined that 24.8% of women were obese and 30.4% were pre-obese (Turkish Statistical Institute, 2019). According to a study of the level of physical exercise in the Turkish population (2010), it was reported that only 25% of the population performed physical exercise at an adequate level (Active Living Association, 2010). It is known that physical activity has a great impact on a healthy life. Only 8.3% of the participants did regular exercise. Therefore, a sedentary lifestyle, obesity, and irregular and infrequent physical activity are among the important causes of diabetes risk factors.

The level of health literacy in women is important not only for themselves, but also for the family and society. It is important to have high levels of health literacy in order to display positive behaviours for health, to have health checks and

to raise healthy generations (Gönenç, 2015). It was determined that there was a significant relationship between the marital status of the women included in the study and their THLS-32 total score, and that the scores of single women were higher ( $p<0.05$ ). Degan et al. (2019) observed in their study that single people had a high level of HL (Degan et al., 2019). These results may be due to differences in participant characteristics. In present study, since the majority of the participants were married, housewives and had more family roles than single women, they set aside less time for their own health. This may have led to the level of health literacy is also affected by education level. Education is a variable that makes the processes of accessing, understanding and evaluating information easier and facilitates adaptation to health practices. It was determined women included in the study and that as the education level increased, their mean health literacy scores increased ( $p<0.05$ ). In the study it was also observed that as the level of education decreased, health literacy decreased (Okyay & Abacıgil, 2016). In our country (2019), 85.7% of women complete at least one level of education (Turkish Statistical Institute, 2019). According to the health literacy research data observed with the THLS-32, it is reported that 7 out of 10 people in our country have an inadequate or limited health literacy level, and that 35.3% of these are women (Turkey's Health literacy level was measured, 2020). In general, in line with these results, as women's education level increases, their health-related reading and writing skills change, they can participate more in activities related to the protection, maintenance and improvement of health, and they can bring about an increase in life expectancy and quality. Those with a high HL level are also more conscious about health information and avoiding factors that may worsen their health. As the

level of HL increases, the individual will live more healthily, and with the improvement of the health level of all individuals, the goal of achieving a healthy society will become more attainable (Öztürk, 2018). It was determined that those with a poor general health status had a lower THLS-32 score than those with a good or moderate health status ( $p<0.05$ ). In the study conducted by Okyay & Abacıgil (2016), the health literacy level of 91.7% of individuals who stated their general health status to be poor was found to be inadequate or problematic, while the health literacy level of 23.3% of individuals who expressed their general health status as excellent was found to be problematic (Okyay & Abacıgil, 2016). It is thought that HL has a very important place in individuals' management of their health. It can be thought that those who access, read and apply health-related information will be better able to make the right decisions, and develop the right attitudes and behaviours concerning their own health, which will, furthermore, contribute positively to the general health situation.

Due to the prevalence of CVD and the high number of deaths, it is important to inform people about the risk factors of the disease. For this purpose, information should be given about the risks of cardiovascular diseases and their prevention, since lack of knowledge and education creates low motivation. As a result, unhealthy lifestyle behaviours occur in the individual (Çürük et al., 2018). In this study, the mean CARRF-KL scale score of illiterate participants was found to be statistically significantly lower compared to the other education groups ( $p<0.05$ ). In their study, Potvin et al. (2000) determined that having a certain level of education is one of the strongest factors among cardiovascular disease risk variables (Potvin et al., 2000). It can be thought that the increase in the level of knowledge and perception capacity accompanying an increase



in the level of education enables an orientation towards a healthy lifestyle and behaviours.

Increasing education level has positive effects on health.. This positivity is associated with an increase in education level, income and social security opportunities (Gençoğlu & Kuşkaya, 2017). People with insufficient education may have difficulties in more than one situation, such as the management of their own health, use of health services, and attitudes and behaviours towards healthy living (Toprakçı & Meşe, 2019). Furthermore, highly educated individuals have greater knowledge for protecting and improving their health. In our study, it was determined that the FINDRSIC scores of illiterate participants were higher than those of the other groups, and that as the education level increased, the FINDRISC scores statistically significantly decreased ( $p < 0.05$ ). In the study conducted in our country, it was found that the risk of developing diabetes was 1.5 times higher in women who had not completed 8 years of education compared to women who had received more education (Satman et al., 2013). According to the studies by Viitasalo et al. (2012) and the National Health and Nutrition Examination Survey (NHANES), which included 20.633 adults in the United States between 1999 and 2010, it was determined that the risk of diabetes decreased as the level of education increased (Viitasalo et al., 2012). Generally, as in this study, educated people are more effective in protecting and improving their health, obtaining and using health-related information, and making the right choices in case of healthcare needs. It can be thought that these individuals can maintain their individual health more successfully.

Health perception is an important form of the way an individual evaluates his/her health status as a whole with its biological, mental and social

aspects (Çimen & Bayık Temel, 2012). In this study, it was determined that the FINDRISC score of women who stated that their general health perception was poor was higher than those of the other groups, and that this difference was significant. In the study carried out by Koçak et al. (2017), it was determined that the type 2 diabetes risk scores of teachers who reported their health status as poor were higher (Koçak et al., 2017). Similarly, the fact that women who perceive their health as good care more about their own health, and that our study group consists of young women without chronic diseases, may have caused a decrease in FINDRISC scores.

Type 2 diabetes emerges as an important health problem during the reproductive periods of women and endangers the health of both the mother and the baby (Ural, 2016). For this reason, it is expected that women who are married will have a higher awareness of diabetes. It was found that the scale scores of single women were low and that the FINDRISC scores of married women were increased ( $p < 0.05$ ). In the NHANES (1999-2010) study, it was stated that the diabetes risk of single individuals was significantly lower (Zhang et al, 2014), while Väättäinen et al. (2016) did not find a relationship between diabetes risk and marital status (Väättäinen et al., 2016). In this study, the fact that the single women were younger and did not have chronic diseases, while the married women were older and housewives may have led to this result. In addition, many women in Turkey generally give birth soon after marriage, and a sedentary lifestyle and weight gain are more common.

### *Limitations*

The fact that the study was carried out with women who came to Family Health Centres determined within a certain date range and that the data depend on the participants' reports can

be considered as limitations of our study.

### IMPLICATIONS FOR PRACTICE

It was determined that one third of the women had insufficient THLS-32 scores, and that their mean CARRF-KL and FINDRISC scores were moderate. Health literacy is one of the factors that has a direct effect on women's health. Increasing the health literacy level of women will affect the health level of the whole of society. Furthermore, it is important to determine the chronic disease knowledge level and risks in women, and to determine their behaviours in this regard. It can be recommended to inform women about health literacy and chronic disease risks by using social media and mass media. Women play a major role in the family's and the next generation's health. Raising awareness of women through education for preventing diseases, and protecting and improving health will contribute to the family's health and therefore to the society's health as well.

### Acknowledgements

Disclosure It has been declared by the authors that there is no conflict of interest. The authors declared no financial support. Authors' contributions: N.T. and H.S.K. designed the study; carried out the data collection; conducted the data analysis; N.T. prepared the manuscript; and H.S.K. and N.T. have given final approval of the version to be published. For the research, permission was obtained from a provincial health directorate (number: 06.07.2020/51), a university's faculty of medicine ethics committee and Family Health Centers (ethics approval number:2020/110), and permission was obtained from the researchers who conducted the validity and reliability study of the scale used in the study. The authors would like to thank the women who took part in this study.

### REFERENCES

- Ağralı, H., & Akyar, I. (2018). Turkish validation and reliability of health literacy scale for diabetic patient. *Acibadem University Health Sciences Journal*, 9(3), 314-321. <https://doi.org/10.31067/0.2018.31>
- Active Living Association. Physical Activity Level Of Turkish Society Research. (2010). Retrieved from: <https://aktifyasam.org.tr/pdf/fiziksel-aktivite-arastirmasi-raporu.pdf>
- Arıkan, İ., Metintaş, S., Kalyoncu, C., & Yıldız, Z. (2009). The cardiovascular disease risk factors knowledge level (CARRF-KL) scale: a validity and reliability study. *Archives of the Turkish Society Cardiology*, 37(1), 35-40. [https://jag.journalagent.com/tkd/pdfs/TKDA\\_37\\_1\\_35\\_40.pdf](https://jag.journalagent.com/tkd/pdfs/TKDA_37_1_35_40.pdf)
- Aras, Z., & Temel Bayık, A. (2017). Evaluation of validity and reliability of the turkish version of health literacy scale. *Florence Nightingale Journal of Nursing*, 25(2), 85-94. <https://dergipark.org.tr/tr/download/article-file/333047>
- Aydın, D., & Aba, Y. A. (2019). The relationship between mothers' health literacy levels and their perceptions about breastfeeding self-efficacy. *E-Journal of Dokuz Eylul University Nursing Faculty*, 12(1), 31-39. <https://dergipark.org.tr/tr/download/article-file/1012233>
- Bayık Temel, A. & Çimen, Z. (2017). Investigation of health literacy, perception of health and related factors in elderly patients with chronic illness. *Journal of Ege University Faculty of Nursing*, 33(3), 105-125. <https://dergipark.org.tr/tr/pub/egehemsire/issue/33737/332345>
- Coşansu, G. (2015). Diabetes: A Global Pandemic Disease. *Okmeydanı Journal of Medicine*, 31, 1-6. [https://jag.journalagent.com/eamr/pdfs/OTD\\_31\\_SUP\\_EK\\_SAYI\\_1\\_6.pdf](https://jag.journalagent.com/eamr/pdfs/OTD_31_SUP_EK_SAYI_1_6.pdf)
- Çürük, G. N. , Bayındır, S. K. & Oğuzhan, A. (2018). The relationship of the healthy lifestyle behaviors and cardiovascular disease risk factors knowledge level of patients with cardiovascular disease and

- their relatives. *Journal of Health Sciences*, 27 (1), 40-47. <https://dergipark.org.tr/tr/pub/eujhs/issue/44573/553197>
- Degan, T. J., Kelly, P. J., Robinson, L. D., & Deane, F. P. (2019). Health literacy in substance use disorder treatment: A latent profile analysis. *Journal of Substance Abuse Treatment*, 96, 46–52. <https://doi.org/10.1016/j.jsat.2018.10.009>
- Deniz, S. , Öztaş, D. & Akbaba, M. (2018). Determining the level of health literacy and affecting factors of health professionals working in primary health care services. *Sakarya Medical Journal*, 8 (2), 214-228. <https://doi.org/10.31832/smj.402835>
- Durusu-Tanrıöver, M., Yıldırım, H.H., Demiray Ready, F.N., Çakır, B.& Akalın, H.E. (2014). Turkey health literacy survey. Retrieved from: <https://www.sagliksen.org.tr/cdn/uploads/gallery/pdf/8dcec50aa18c21cdaf86a2b33001a409.pdf>
- Efe Arslan, D., & Kılıç Akça, N. (2020). Cardiovascular risk awareness of academic staff. *Kocaeli Medical Journal*, 9(2), 31-38. <https://www.journalagent.com/z4/vi.asp?pdire=kocaelitip&pling=tur&un=KTD-15010>
- Evaluation by ARDL Bound Test Method. *Journal of Business and Economics Studies*, 5(4), 1-11. <https://dergipark.org.tr/tr/download/article-file/842243>
- Gönenç İ.M, Health literacy in terms of women's health. Retrieved from: [https://acikders.ankara.edu.tr/pluginfile.php/114967/mod\\_resource/content/1/Sa%C4%9F1%C4%B1k%20Okuryazarl%C4%B1%C4%9F%C4%B1.pdf](https://acikders.ankara.edu.tr/pluginfile.php/114967/mod_resource/content/1/Sa%C4%9F1%C4%B1k%20Okuryazarl%C4%B1%C4%9F%C4%B1.pdf)
- Koçak, H.S., Öncel, S., Zincir, H.& Seviğ, E.Ü. (2017). Determining primary school teachers' type 2 diabetes risk and healthy lifestyle behaviors. *Turk Journal of Public Health*, 15(2), 70-83. <https://doi.org/10.20518/tjph.341151>
- Okyay, P.,& Abacıgil, F. (2016). Turkish health literacy scales reliability and validity study. Retrieved from: <https://sbu.saglik.gov.tr/Ekutuphane/kitaplar/Sa%C4%9F1%C4%B1k%20Okur%20Yazarl%C4%B1%C4%9F%C4%B1.pdf>
- Özonuk, E. & Yılmaz, M. (2019). Relationship between health literacy and compliance with the treatment among individuals with type 2 diabetes mellitus. *Journal of Education and Research in Nursing*, 16(2), 96-103. [https://jer-nursing.org/Content/files/sayilar/75/KUHEAD\\_16\\_2\\_96\\_103.pdf](https://jer-nursing.org/Content/files/sayilar/75/KUHEAD_16_2_96_103.pdf)
- Öztürk, E.U. (2018). Health literacy and its importance. *Biruni Journal of Health and Educational Sciences*, 1(1), 1-5. <https://dergi.biruni.edu.tr/wp-content/uploads/2018/11/9.SA%C4%9ELIK-OKURYAZARLI%C4%9E1.pdf>
- Potvin, L., Richard, L., & Edwards, A. C. (2000). Knowledge of cardiovascular disease risk factors among the Canadian population: relationships with indicators of socioeconomic status. *Canadian Medical Association Journal*, 162(9), 5-11. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1232442/>
- Ruhuşen, K., Sayın, S.& Koçak, A. (2016). Applicability of the Finnish Diabetes Risk (FINDRISC) as a Screening Tool for Type 2 Diabetes Mellitus. *Konuralp Medical Journal*, 8(3),158-166. <https://acikerisim.erbakan.edu.tr/xmlui/bitstream/handle/20.500.12452/1612/ruhu%c5%9fen%20kutlu.pdf?sequence=1&isAllowed=y>
- Satman, I., Omer, B., Tutuncu, Y., Kalaca, S., Gedik, S., Dincecag, N., Karsidag, K., Genc, S., Telci, A., Canbaz, B., Turker, F., Yılmaz, T., Cakir, B., Tuomilehto, J., & TURDEP-II Study Group (2013). Twelve-year trends in the prevalence and risk factors of diabetes and prediabetes in Turkish adults. *European Journal of Epidemiology*, 28(2), 169–180. <https://doi.org/10.1007/s10654-013-9771-5>
- Taşkın Yılmaz, F., Karakoç Kumsar, A., & Çelik, S. (2018). The association between healthy lifestyle behaviors and knowledge levels about cardiovascular disease risk factors in people with type 2 diabetes. *Journal of Education and Research*

