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ORIGINAL ARTICLE / ORİJİNAL MAKALE

Health literacy in elderly people: A quantitative research example from the Eastern Black Sea Region of Turkey

Yaşlılarda sağlık okuryazarlığı: Türkiye Doğu Karadeniz örneğinde nicel bir araştırma

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ABSTRACT

Objective: The aim of the study was to determine the health literacy status of people aged 65 and over in Turkey. **Methods:** This study is descriptive and cross-sectional. The population consisted of people aged 65 and over living in the centre of a province. 2017 data from the Turkish Statistical Institute were used for the sample size. Following the calculations, sampling was taken from 486 people. Data were collected between January and May 2018. Ethical permission was obtained prior to the study. Participants were selected according to the improbable method among those who came to primary health institutions. A survey form was used as a data collection tool. The first part of the form determined the socio-demographic characteristics of the participants. TSOY-32 was used in the second section. A score 0 indicated the lowest HL and the score 50 indicated the highest HL in the scale. **Results:** The average score of the study participants in the 'Turkey Health Literacy-32' test was 24.40 ± 7.70. In this study, score means were high among people with regular health checks, those who did not use unprescribed medication, those who quit smoking, who exercised regularly and who had adequate nutrition. **Conclusion:** Health literacy of individuals aged 65 and over was found to be inadequate.

Keywords: Elderly, health literacy, quantitative research

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ÖZ

Amaç: Araştırmanın amacı 65 yaş ve üşüt kişilerin sağlık okuryazarlığını belirlemektir. **Yöntem:** Araştırma tanımlayıcı kesitsel tiptedir. Evren bir ilin merkezinde yaşayan 65 yaş ve üstü kişilerden oluşmaktadır. Örneklem büyüklüğü için Türkiye İstatistik Kurumunun 2017 verileri kullanılmıştır. Hesaplamalar sonrası örnekleme 486 kişi alınmıştır. Veriler ocak-Mayıs 2018 arasında toplanmıştır. Katılımcılar birinci basamak sağlık kurumlarına gelenler arasından olasılıksız yönteme göre seçilmiştir. Veri toplama aracı olarak anket formu kullanılmıştır. Formun ilk bölümü katılımcıların sosyo-demografik özelliklerini saptamaktadır. İkinci bölümde TSOY-32 kullanılmıştır. Çalışma; Ocak-Mayıs 2018 tarihleri arasında yürütülmüştür. Araştırmanın evrenini İlin Merkezinde yaşayan yaşlı nüfus oluşturmuştur. **Bulgular:** Araştırmadaki katılımcılar için "Türkiye Sağlık Okuryazarlığı-32 Ölçeği" genel toplam puan ortalaması 24.40 ± 7.70 olup yetersiz SOY kategorisindedir. Bu araştırmada ölçeğin; genel, boyut ve süreç puan ortalama indekslerinin; yaş arttıkça düşme gösterdiği, erkeklerde, yaşamının çoğunluğunu kentsel alanda geçirenlerde, eğitim düzeyi yüksek olanlarda, evlilerde, halen çalışıyor olanlarda, ailede alınan kararlara katılıyor olanlarda yüksek olduğu tespit edilmiştir. **Sonuç:** Araştırmada ölçeğin genel puan ortalama indeksinin; düzenli sağlık kontrolü yaptıranlarda, reçetesiz ilaç kullanma alışkanlığı olmayanlarda, sigarayı bırakmış olanlarda, düzenli egzersiz yapanlarda ve düzenli beslenenlerde daha yüksek olduğu tespit edilmiştir.

Anahtar kelimeler: Yaşlı, sağlık okuryazarlığı, nicel araştırma

Introduction

The problems associated with an ageing population that were previously more apparent in developed countries are now becoming evident in developing countries. In a report published by the United Nations, people aged 65 and above will make up 26% of the world's population in 2050. In Turkey, this percentage is estimated to reach 20.8% in 2050.[1]

This ageing population, which is a worldwide demographic phenomenon, makes the treatment of diseases more challenging due to a lack of sufficient and clear guidance on the chronic diseases that are prevalent among older adults and the inability of older adults to understand advices provided by healthcare professionals.[2] In countries where health services are sufficiently used and patients can choose their doctors, patients often have high levels of knowledge regarding healthcare, allowing them to make informed choices. However, the accuracy and adequacy of these choices are closely related to the Health Literacy (HL) level of society.[3] Within the scope of HL, it is necessary to educate patients on their rights and to create educational materials, such as prospectuses on medications and public health announcements.

The term HL was first used by Scott K. Simonds in 1974.[4] In 2013, the World Health Organization defined HL as being 'related to general literacy, and it is the desire and capacity of people to develop opinion and decide on issues of health services throughout their lives, to reach sources of health-related information to protect, maintain and improve their health and to increase their life quality, and to

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perceive and understand the health-related information and messages correctly.[5] According to the 2009 report from the United Nations Educational, Scientific and Cultural Organization, 776 million people worldwide do not possess essential HL.[6] The overall HL index in Turkey was found to be 30.4, meaning that 24.5% of the Turkish society has 'inadequate' HL and 40.1% has 'problematic' levels of HL.[7] The 'Turkey Healthy Aging Action Plan and Implementation' was initiated by the Ministry of Health to be executed from 2015 to 2020. However, there is no precise data to show the overall HL level of elderly people in Turkey. The objective of this study is to determine the perception of the elderly people regarding healthcare treatment and services, health protection and development and their levels of reaching, understanding, evaluating and using health-related information. The study population includes people aged 65 and above living in the centre of a province in the Eastern Black Sea Region of Turkey.

Methods

The sample group of the cross-sectional field study was selected from the centre of a province in the Eastern Black Sea Region. Data were collected between January and May 2018. According to a 2017 figure from the Turkish Statistical Institute, adults aged 65 and older made up 13.216% of the population. The sample size for this study was calculated to be 486 with a deviation of 4% within the reliability rate of 95% (n = Nt2pq/d2(N–1) + t2pq). Since Turkey's general health literacy level was reported as 30.4% in the literature, p value was taken as 0.3 in this research.[8] All primary care institutions used by the study participants were in the province centre. Participants were chosen according to the remote sampling method and consisted of 486 volunteers who met the inclusion criteria for the study group. The researchers collected data through in-person interviews.

Criteria to be included in the study group: People aged 65 and above, possessing literacy or a higher level of education, having adequate cognitive function, being oriented to time and space and voluntarily participating in the study. Criteria to be excluded from the study group: Having a physical, mental or social disease that prevents cooperation; having an auditory, visual and cognitive function disorder; and verbally refusing to participate in the interview. Written consent was not used since it would reduce the rate of participation.

Data Collection Instruments: Data was collected using a survey form drafted by the researchers in this study. Researchers created the survey questions based on their evaluation of the relevant literature applying to elderly adults who met the inclusion criteria.

Survey form: The survey form consisted of two parts: the first part focused on defining qualities for some conditions, i.e. the independent variables of the study. The second part contained the TSOY-32, which served as the dependent variable of the study.

TSOY-32 scale: This scale is a Likert-type scale and was obtained by adapting the European Health Literacy Research Consortium (HLS-EU)[9] evaluation for a Turkish population. Okyay and Abacıgil conducted the reliability and validity analysis of the scale in 2016. The HLS-EU scale consists of 47 items, whereas the TSOY-32 scale consists of 32 items. The TSOY-32 scale consists of two dimensions and four processes, two sub-dimensions being Treatment and Service (TS) and Protection from Diseases/Improvement of Health (PD/IH). The processes include Reaching Health-Related Information (RHI), Understanding Health-Related Information (UHI), Evaluating Health-Related Information (EHI) and Using/Implementing Health-Related Information (HIU/I). The Cronbach's alpha value of the TSOY-32 scale reliability in Turkish population was 0.927.7 TS dimension 0.880 and PD/IH dimension 0.863. In the present study, the Cronbach's alpha values were determined to be .93 in TSOY-32,.87 in TS,.90 in PD/IH,.84 in UHI,.75 in EHI and .76 in HIU/I. The scale consists of 32 questions and is a 5-point Likert-type scale. Each item has four options: 1 = very

easy, 2 = easy, 3 = difficult, 4 = very difficult. Code 5 is used for the phrase 'no idea'. In score calculation, the items are re-coded to be 1-4, 2-3, 3-2 and 4-1, and the answers for five are coded in the statistics programme by the missing value approach. The total score is standardised to have a value between the total counts of 0–50 for the ease of calculation. Score 0 indicates the lowest HL and score 50 indicates the highest HL in the scale. According to the obtained score, the TSOY-32 scale is divided into four categories: 0–25 points = insufficient HL, >25–33 points = problematic-limited HL, >33–42 points = sufficient HL, >42–50 points = perfect HL.

Independent variables of the study: Definitive qualities are health histories, health behaviours, health condition perceptions, information on health personnel, attitude and practices and health service usage levels. The dependent variable of the research: Average score indices of the general, sub-dimensions and processes of the TSOY-32 scale.

Evaluation of data: The obtained data were evaluated using the statistical package programme, and the error controls, tables and statistical analyses were carried out. Descriptive data are given as a percentage and are reported as mean ± standard deviation. The Chi-squared test was used to analyse the categorical data, whereas the Student's t-test and One-Way Analysis of Variance were used to analyse interval/ratio data. Tukey's HSD (honestly significant difference) test was conducted for post hoc analysis. Internal consistency analysis was done, and Cronbach's alpha value was calculated for the general score of the scale and the average score indices of dimension and process. Pearson's correlation analysis was implemented to determine the direction and level of the relationship between the continuous variables of measurement. Type 1 error level (alpha) was determined to be 0.05.

Ethics principles and permissions of the study: Written permission was obtained from the Clinical Researches Ethics Board (2017/02). Permissions were obtained from the Directorate of Public Health of the province where the study was conducted and from the Public Health Institution of the Republic of Turkey. Permission for the use of TSOY-32 was obtained from Pınar Okyay. The participants were informed orally, with a document attached to the survey in line with the criteria of the Helsinki Declaration. Written consent was not requested since it would reduce the participation rate.

Data collection: Following the official permissions, the study was conducted on 486 people who met the inclusion criteria according to the remote sampling method. Filling up the forms took around 40 min. During data collection, the participants were informed about the protective health consultancy for the health problems included in the survey on which they wanted to be better informed.

Results

The average age of the study participants was 73.39 ± 7.33 (65–102). Out of these participants, 45.3% were male, 86.9% did not receive education beyond primary school (only literate, no graduation), 51.2% lived in rural areas, 62.3% were currently married, and 4.9% were presently employed. Of the participants, 45.7% stated that their income was sufficient for their lifestyle, and 65.0% suffered from a chronic disease. 3.1% of participants suffered violence within the past year, of which 2.5% experienced emotional violence and 1.2% experienced economic violence. 78.6% of the study participants were aware of their right to choose their doctor. 64.0% of the participants stated that they use this right, and 34.9% reported that they always visit a second doctor's office for the diagnosis and treatment of their health problems.

As shown in Table 1, 52.1% of the participants reported that they have regular health checks. In the present study, 20.0% of patients reported using medications that were not prescribed by a doctor. The percentage of patients who stated that they exercised regularly was 13%.

The most common reason for seeking a second opinion (34.8%) was the need to have their diagnosis confirmed by a second doctor. Although the percentage of the

participants who report to a family doctor is high (75.5%), this rate is reduced nearly by half (38.8%) in the event of reporting to a family physician within the last year. In the present study, 51.1% of the participants stated that they received their healthcare information from a doctor, 30.5% from the television and 5.3% from their immediate circle of friends. On the other hand, 70.4% of participants reported that they first visit a doctor when they feel ill, 17.7% said that they use the medicines available at home, and 1.9% said they used traditional methods of treatment. Participants preferred to visit the following organisations when they felt sick: state hospitals (66.3%), family health centres (28.6%), private hospitals, (3.3%), university hospitals (1.2%) and pharmacies (0.6%). 21.2% of participants reported that they have benefitted from ambulance services.

Table 1. Distribution of participants according to some of their health behaviours

Some health behaviours	**Property**	**Number**	**%**
Regular health check	Yes	253	52.1
	No	233	47.9
Presently using a prescription	Yes	276	56.8
(prescription)	No	210	43.2
The habit of using a drug without a	Yes	97	20.0
prescription	No	389	80.0
Type of medicine used without	Analgesic	63	94.0
prescription	Wound healing	2	3.0
	Vitamins	1	1.5
	Stomach medicine	1	1.5
Smoking habit	Drinks at least once every day	42	8.6
	Drinks occasionally	10	2.1
	No longer using	98	20.2
	He never drank	336	69.1
Alcohol habit	Everyday	1	0.2
	Once or twice a week	4	0.8
Alcohol release year	Once or twice a month	10	2.1
	Less than a year	9	1.9
	He never drank	422	86.8
	No longer using	40	8.2
Exercise regularly	No	193	54.7
	Regular	46	13.0
	Occasionally, irregular	114	32.3
Regular eating habits	Yes	265	75.3
	No	87	24.7
Feel enough that you can relax	Yes	258	73.5
	No	93	26.5

In the present study, the percentage of older adults with insufficient TSOY-32 level is 59.7%. The percentage of those in the problematic-limited range is 28.2%, of those in the sufficient level is 10.1% and of those within the perfect range is 2.1%. When the percentages of individuals in each HL category are compared, 24.5% of Turkish citizens have insufficient levels of HL, 40.1% have problematic-limited levels of HL, 27.8% have sufficient levels of HL, and 7.6% have perfect levels of HL.

The mean overall score for TSOY-32 among study participants was 24.40 ± 7.70 (min: 3.79, max: 50.00). The sub-dimension score average of the TSOY-32 scale was 24.30 ± 8.18 (min: 4.17, max: 50.00) for TS and 24.51 ± 8.33 (min: 1.41, max: 50.00) for HP/HD. The score averages for RHI, UHI, EHI and HIU/I, which are the processes included in the TSOY-32 scale, were (min: 0.00, max: 50.00), 24.49 ± 8.65 (min: 2.08, max: 50.00), 24.69 ± 7.85 (min: 2.08, max: 50.00) and 25.36 ± 8.64 (min: 2.08, max: 50.00).

The Chi-squared analyses of the TSOY-32 categorical rates with some variables were conducted (Table 2), and the following results were obtained. The following categorical rates were not found to be significant: the age range of the participants, the presence of any disability and smoking and alcohol habits ($p = 0.053$). Among women, TSOY-32 scores were much more likely to fall into the insufficient, problematic and limitedly sufficient ranges. However, men were significantly more likely to fall into the sufficient and the perfect regions ($p = 0.001$). The TSOY-32 categorical rates among participants who mainly lived in rural areas had higher numbers in the insufficient, problematic and limitedly sufficient areas, whereas city-dwelling participants had higher percentages of people in sufficient and perfect ranges ($p = 0.001$). The TSOY-32 scores among participants who are married and unemployed and who know their family doctor were significantly more likely to be within the insufficient range ($p = 0.001$). TSOY-32 categorical rates among the people who were literate and who had completed primary school education fall into the insufficient, problematic-limited, sufficient and perfect categories. The percentage of participants in the problematic and limitedly sufficient ranges was higher in people with secondary school and high school education compared with those with university education. By contrast, people with university education were more likely to rate in the sufficient range of the TSOY-32 ($p = 0.001$) compared with other groups. The participants in the TSOY-32 categorical rates who are currently unemployed are higher in all areas (insufficient, problematic-limited, sufficient and perfect), with the highest percentage falling into the insufficient category ($p = 0.028$).

In the present study, it was found that TSOY-32, TS, HP/HI, RHI, UHI, EHI and HIU/I score average indices decreased as the age of the participants increased. These indices were more likely to be higher among men, those who spend majority of their lives in urban areas, those with high levels of education, married participants, currently employed participants and those who participated in making decisions for their families. These findings are compatible with the national and international literature (Table 3). The general, dimension and process score average indices for the TSOY-32 were higher in participants without disabilities; who have regular health examination; who have adequate nutrition; who are identified as having good physical, mental and emotional health perceptions; those who are aware of and use their right to choose a doctor; those who consult a second doctor for an existing diagnosis; those who know the doctor they are registered to; and those who know the phone number to ambulance services ($p < 0.05$).

On the other hand, there is a negative, inferior relationship between age and the average score indices of TSOY-32 general, dimension and process; a positive, very high relationship between TSOY-32 and TS, PD / IH, RHI, UHI, EHI, HIU / I; a positive, high relationship between TS and PD / IH and between RHI, UHI, EHI, HIU / I; a positive, high relationship between PD / IH and RHI, UHI, EHI, HIU / I; a positive, high relationship between RHI and PD / IH, UHI, EHI, HIU / I; a positive, high relationship

between UHI and EHI, HIU / I; and a positive, high relationship between EHI and HIU / I.

Table 2. Distribution of TSOY-32 categorical rates with some variables (n= 486)

Variable	Characteristic	Insufficient n (%)*	Problematic-Limited Enough n (%)*	Sufficient n (%)*	Perfect n (%)*	Test Value
Gender	Men	113 (39.0)	66 (48.2)	33 (67.3)	8 (80.0)	χ^2 =
	Women	177 (61.0)	71 (51.8)	16 (32.7)	2 (20.0)	19.626
						p = 0.001
Longest living area	Rural area	165 (56.9)	70 (51.1)	10 (20.4)	4 (40.0)	χ^2 =
	Urban area	125 (43.1)	67 (48.9)	39 (76.9)	6 (60.0)	22.864
						p = 0.001
Marital Status	Married	157 (54.1)	96 (70.1)	41 (83.7)	9 (90.0)	χ^2 =
	Single / widowed	133 (45.9)	41 (29.9)	8 (16.3)	1 (10.0)	24.559
						p = 0.001
Working status	Yes	10 (3.4)	7 (5.1)	5 (10.2)	2 (20.0)	χ^2 =
	No	280 (96.6)	130 (94.9)	44 (89.8)	8 (80.0)	9.107
						p = 0.028
Family doctor recognition	Yes	194 (67.6)	116 (85.3)	45 (91.8)	9 (90.0)	χ^2 =
	No	93 (32.4)	20 (14.7)	4 (8.2)	1 (10.0)	24.966
						p = 0.001
Education level	Literate	201 (69.3)	56 (40.9)	13 (26.5)	0 (0.0)	
	Primary school	72 (24.8)	55 (40.1)	21 (42.9)	4 (40.0)	χ^2 =
	Secondary	10 (3.4)	13 (9.5)	4 (8.2)	1 (10.0)	98.991
	School	5 (1.8)	7 (5.1)	4 (8.2)	2 (20.0)	**p = 0.001**
	High School	2 (0.7)	6 (4.4)	7 (14.2)	3 (30.0)	
	University					
Regular health check	Yes	138 (47.6)	76 (55.5)	31 (63.3)	8 (80.0)	χ^2 =
	No	152 (52.4)	61 (44.5)	18 (36.7)	2 (20.0)	8.559
						p = 0.036

**Column percentage is taken. Significant at the 0.05 and 0.001 level.*

Table 3. Distribution of TSOY-32 general, dimension and process score average indices of the participants according to some of their defining qualities (n = 486).

Data (n = 486)	Property	n	General	Dimensions Score		Process Score			
			TSOY-32	TS	PD / IH	RHI	UHI	EHI	HIU / I
			Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean±SD	Mean±SD
Age group	65-74	310	25.13 ± 7.94[a]	25.08 ± 8.40[a]	25.18 ± 8.33[a]	24.04 ± 9.58[a]	25.12 ± 8.82[a]	25.37 ± 7.90[a]	26.00 ± 8.69[a]
	75-84	124	25.88 ± 7.58[b]	23.61 ± 7.77	24.16 ± 8.45	21.80 ± 9.08	24.38 ± 8.46[b]	24.24 ± 8.02	25.12 ± 8.47
	≥85	52	21.29 ± 6.61[a,b]	21.23 ± 7.00[a]	21.35 ± 7.29[a]	20.34 ± 7.66[a]	21.03 ± 7.25[a,b]	21.70 ± 6.32[a]	22.09 ± 8.11[a]
p value*			**0.003**	**0.004**	**0.007**	**0.006**	**0.007**	**0.006**	**0.010**
Gender	Male	220	26.12 ± 8.33	26.43 ± 8.45	25.80 ± 9.13	25.49 ± 9.74	26.09 ± 9.13	25.70 ± 8.47	27.19 ± 9.14
	Female	266	22.99 ± 7.03	22.53 ± 7.52	23.45 ± 7.45	21.08 ± 8.52	23.18 ± 8.01	23.85 ± 7.20	23.84 ± 7.20
p value *			**0.001**	**0.001**	**0.002**	**0.001**	**0.001**	**0.010**	**0.001**
Longest living area	Rural area	249	22.94 ± 7.36	22.79 ± 7.72	23.09 ± 8.00	21.31 ± 8.66	22.96 ± 8.34	23.58 ± 7.92	23.91 ± 8.12
	Urban area	237	25.94 ± 7.95	25.87 ± 8.37	26.00 ± 8.42	24.93 ± 9.69	26.10 ± 8.69	25.85 ± 7.62	26.87 ± 8.92
p value *			**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**
Educational level	Literate	270	21.80 ± 6.85[a,b,c,d]	21.36 ± 7.22[a,b,c,d]	22.23 ± 7.45 [a,b,c,d]	19.77 ± 8.44 [a,b,c,d]	21.67 ± 7.57 [a,b,c,d]	22.83 ± 7.26 [a,b]	22.92 ± 7.97 [a,b,c,d]
	Prim. school	152	26.41 ± 7.20[a,e]	26.81 ± 7.41[a,e]	26.02 ± 7.97[a,e]	25.61 ± 8.33[a]	26.80 ± 8.34[a]	25.86 ± 7.51[a]	27.39 ± 8.11[a,e]
	Sec. school	28	28.38 ± 7.35[b,c]	28.44 ± 7.73[b]	28.31 ± 8.15[b]	28.71 ± 7.99[b]	29.14 ± 7.41[b]	27.16 ± 8.44[c]	28.51 ± 8.62[b]
	High school	18	29.85 ± 8.18	29.85 ± 8.57[c]	29.85 ± 8.54[c]	30.89 ± 9.05[c]	29.83 ± 9.36[c]	28.89 ± 8.18[c]	29.78 ± 8.32[c]
	University	18	34.86 ± 7.83[d,e]	35.05 ± 7.30[d,e]	34.68 ± 9.57[d,e]	34.64 ± 8.64[d,e]	34.91 ± 8.94[d,e]	34.58 ± 6.53[b]	35.33 ± 8.93[d,e]
p value *			**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.001**

Table 3 continuous.

Marital status	Married	303	25.52 ± 8.14	25.51 ± 8.42	25.53 ± 8.84	24.62 ± 9.69	25.61 ± 9.03	25.31 ± 8.11	26.53 ± 8.67
	Single, widow	183	22.56 ± 6.82	22.29 ± 7.37	22.83 ± 7.10	20.51 ± 8.14	22.64 ± 7.65	23.66 ± 7.30	23.42 ± 8.24
p value *			**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.025**	**0.001**
Working condition	Yes	24	28.58 ± 8.45	29.06 ± 9.29	28.11 ± 8.22	28.02 ± 9.87	28.12 ± 9.72	27.93 ± 8.22	30.26 ± 9.34
	No	462	24.19 ± 7.71	24.05 ± 8.05	24.32 ± 8.30	22.82 ± 9.26	24.31 ± 8.56	24.52 ± 7.80	25.10 ± 8.53
p value *			**0.007**	**0.003**	**0.030**	**0.008**	**0.035**	**0.038**	**0.004**
Who looks if necessary	No one	26	26.52 ± 6.18	27.06 ± 7.79	25.98 ± 5.64	21.11 ± 7.49	25.66 ± 7.07	25.31 ± 5.62	28.00 ± 7.44
	Family members	442	24.14 ± 7.83	24.07 ± 8.17	24.21 ± 8.40[a]	22.77 ± 9.39	24.22 ± 8.67	24.52 ± 7.89	25.05 ± 28.92
	Out of family	18	27.75 ± 8.22	25.78 ± 8.45	29.72 ± 8.30[a]	24.72 ± 9.59	29.51 ± 8.91	27.87 ± 9.11	25.36 ± 8.64
p value *			0.05	0.14	**0.015**	0.053	**0.030**	0.191	**0.049**
Number of children	No children	10	27.91 ± 10.13	26.46 ± 10.39	29.36 ± 10.31	24.76 ± 12.42	27.99 ± 10.17	28.98 ± 10.56	29.92 ± 9.23
	Between 1 and 2	52	26.78 ± 6.67[a]	27.06 ± 7.32[a]	26.50 ± 7.27	25.80 ± 8.50[a]	26.83 ± 7.65[a]	26.88 ± 6.42[a]	27.61 ± 7.47[a]
	Between 3 and 5	308	24.49 ± 7.95	24.49 ± 8.35	24.49 ± 8.47	23.31 ± 9.65	24.61 ± 8.80	24.61 ± 7.97	25.42 ± 8.84
	6 and above	116	22.81 ± 7.32[a]	22.36 ± 7.48[a]	23.27 ± 7.99	21.08 ± 8.23[a]	22.84 ± 8.25[a]	23.55 ± 7.62[a]	23.78 ± 8.24[a]
p value *			**0.008**	**0.004**	**0.030**	**0.016**	**0.021**	**0.023**	**0.016**
Participation in the decisions taken in the family	Yes	325	25.55 ± 7.89[a]	25.53 ± 8.14[a,b]	25.57 ± 8.52[a]	24.36 ± 9.49[a]	25.80 ± 8.63[a]	25.51 ± 7.94[a]	26.54 ± 8.58[a]
	No	31	22.39 ± 7.99	21.91 ± 7.64[b]	22.88 ± 9.00	19.75 ± 9.95	22.35 ± 8.56	24.13 ± 7.80	23.34 ± 9.35
	Sometimes	130	22.01 ± 6.87[a]	21.77 ± 7.74[a]	22.26 ± 7.14[a]	20.65 ± 8.14[a]	21.75 ± 8.01[a]	22.76 ± 7.32[a]	22.88 ± 8.04[a]
p value *			**0.001**	**0.001**	**0.001**	**0.001**	**0.001**	**0.003**	**0.001**

**Groups with difference caused according to the Independent-Samples T test/ One-Way ANOVA test. [a,b,c,d,e] Tukey HSD. TS: Treatment and Service, PD/IH: Protection from Diseases/Improvement of Health, RHI: Reaching to Health Related Information, UHI: Understanding Health-Related Information, EHI: Evaluating Health-Related Information, HIU/I: Using/Implementing Health-Related Information.*

Discussion

HL is a current public health issue that should be addressed. Low HL among citizens leads to poor disease control, increased complications, reduced quality of life, patient noncompliance, dissatisfaction from healthcare services, poor information on healthcare services, increased incidence of chronic diseases, insufficient disease indicators and less use of protective health services.[10] People with low levels of HL are also more likely to be hospitalised, frequently use emergency service and have a higher risk of mortality. Low level of HL also leads to poor system/operation-based outcomes regarding healthcare costs, resource allocation and the formation of new programmes and interventions.[11] Elderly individuals are more likely to experience loss of physical activity, socioeconomic status and poor interpersonal support and become dependent on others.[12] The poverty rate (in Turkey), which is calculated according to the 60% of the available individual median income of the equivalent household, is 16% for the elderly population in 2016. In 2016, 14.7% of elderly men and 17% of elderly women were reported to be in poverty, and the unemployment rate of the elderly population was 2.6%.[13]

In the present study, the percentage of older adults with an insufficient TSOY-32 level is 59.7%. In the study of Özkan et al., the rate of those who were 65 years old and over who reported insufficient levels of health literacy was 65.5%.[14] When the percentages of individuals in each HL category are compared, 24.5% of Turkish citizens have insufficient levels of HL, 40.1% have problematic-limited levels of HL, 27.8% have sufficient levels of HL, and 7.6% have perfect levels of HL. Within Europe, 12.4% of people have insufficient levels of HL, 35.2% have problematic-limited levels of HL, 36% have sufficient levels of HL, and 16.5% have perfect levels of HL.[15] Studies carried out worldwide indicate that HL levels are lower in older adults regardless of whether the country is developed or developing.[16] In a study by Durusu Tanrıöver et al., only one-third of the nation within the age range of 41.4 ± 0.3 years has a HL level within the sufficient or perfect range. According to this study, this percentage was lower among people over the age of 65.[8] The study by Okyay and Abacıgil reported that the proportion of people with insufficient and problematic-limited HL levels is higher among elderly people.[7] Bozkurt and Demirci found that the HL level was in the insufficient range among 44.6% of elderly adults, whereas 40.5% were within the problematic-limited range.[17] It was reported that elderly adults with limited HL levels were more likely to have adverse health outcomes.[18] A study conducted in Poland found that 61.3% of the individuals aged 65 and above had insufficient or problematic-limited HL levels, 26.8% had sufficient HL levels, and 12% had perfect HL levels.[19] In a study by Tiller et al. that examined German adults between the ages of 55 and 91, women, individuals over the age of 80 and individuals with intermediate levels of education were more likely to have insufficient HL levels.[20]

In the study by Durusu Tanrıöver et al., HL index scores were higher in men, people under the age of 65 and those with a high level of education.[8] A study by Okyay and Abacıgil showed that there were no significant sex-dependent differences within the general and sub-dimensions of TSOY-32 as well as its processes ($p > 0.05$). However, the average scores of the indices decreased as the age increased ($p < 0.05$), and the score increased with the education level.[7] These results are similar to the findings of the present study.

In a study by Catı et al., the patient's choice of a university hospital was associated with a high income level. These were reported to be variables that led to differences in the HL score, which differs from the present study. However, the same study also found that the HL scores concerning EHI decreased as the age increased, which is similar to the present study.[21] The study by Caylan et al. showed that the factors affecting HL were the patient's educational level (HL score is higher in those with higher educational level), marital status and sex (women have higher HL scores) according to the extent of the effect coefficient.[22] In the study by Çimen and Bayık, average HL scores were higher among women, people between the ages of

65 and 75 years, married people, people who spent majority of their lives in big cities, currently employed people and high-income individuals.[23] The lower levels of general literacy, employment and healthcare awareness may lead to low HL levels among women in Turkey. In a study by Federman et al. focusing on elderly individuals with asthma, age, income level, educational level and perception on health condition were found to be significantly associated with HL ($p < 0.05$). Similar to the present study, it was reported that the percentage of those who had sufficient HL decreased with age, but increased with educational level.[24] In the study by Chung et al. focusing on elderly Taiwanese adults, HL score decreased with age and increased with marital status and educational level, which is similar to the present study. However, this study showed that women had higher HL scores, which is contrasting with the results of the present study.[25] A study in Poland reported that old age and high educational level are significant determining factors for HL.[19] In a study on elderly Korean adults, older age, higher educational level, being married, being employed, having good perception of one's health condition and lack of chronic disease were determined to be the variables causing a difference for HL.[26] In a study on elderly people with asthma in the United States, the HL level decreased as the age increased, but higher income levels were associated with higher HL levels.[24] In a study by Liu et al., HL score decreased with age, whereas the average HL score was higher among men, married people, high-income individuals and those with high levels of education.[27] Similarly, in a study by Halverson et al. which looked at HL differences among cancer patients, the HL level was higher among people who live in urban areas ($p < 0.05$).[28]

Higher HL levels among individuals would promote the sharing of responsibilities with those who provide and those who receive healthcare services, which results in better outcomes for both parties. These studies indicate that individuals with low HL level are more likely to be hospitalised, use emergency services, misuse medication and spend more on healthcare due to unnecessary hospital visits.[16]

In the present study, TSOY-32 general score average indices were higher in those who have regular health checks, who do not use unprescribed medication, who currently smoke or smoked in the past, who exercise regularly and who have adequate nutrition. Also, variables including regular health checks, exercise and having sufficient rest were significant in all sub-dimensions and processes ($p < 0.05$). The regular use of medication for disease was high in the HP / HD dimension and HIU / I process; the habit of using unprescribed medication was significant in both sub-dimensions and in the processes of UHI and HIU/I; smoking was significant in the TS dimension and in the processes of RHI, UHI, HIU / I; and alcohol use was significant in the TS dimension and in the RHI process. In the study by Çimen and Bayık, the HL score averages were higher in those who took medication, who were hospitalised several times and who did not use emergency services. Some of these findings are similar to data found in the present study.[23] In the study by Liu et al., the average HL score was found to be significantly higher ($p < 0.05$) among those who did not smoke and use alcohol, whereas it was higher among those who exercised regularly and who had regular checks[26]. In the study by Mosher et al., there was no difference in the HL level associated with medication use.[29] In the study by Macleod et al. which compared the HL levels of sick individuals and healthy individuals according to various socio-demographic qualities, the HL level was found to be significantly ($p < 0.05$) higher in both sick individuals and healthy individuals who do not smoke.[30]

This study found that the TSOY-32, TS, RHI, UHI, EHI and HIU / I score average indices decreased among the general, physical, mental and emotional dimensions ($p < 0.05$). There was no significant effect of the PD / HD process on general health ($p > 0.05$), but this process caused significant differences among all other parameters of the scale ($p < 0.05$). In the literature, HL levels significantly increased among older adults who have good health perception.[25,27,30]

In this study, it was determined that half of the elderly people have health checks have insufficient HL levels. Elderly people who are not employed and who do not have regular health checks have largely insufficient HL levels. The general indices of the HL scale and the dimensions and processes decreased with age but are higher among men, those who spend majority of their lives in urban areas, those with high level of education, married individuals, currently employed individuals and those who participate in family decisions. HL general score average indices are higher in people who do not use unprescribed medication, who quit smoking, who exercise regularly and who have good nutrition. The general, dimension and process score average indices are higher in the participants with high levels of perception of general, physical, mental and emotional health.

In line with these results, it is recommended that regular and constant studies should be carried out to determine and increase the HL levels of elderly people. It is also recommended to promote awareness and support among elderly people regarding regular exercise, balanced nutrition and quitting risky behaviours, such as smoking and alcohol use. These people should be informed about access to emergency health services and basic health services when they or their relatives have poor health conditions, and they should be provided with education and awareness on regular health checks. Finally, environments should be created to support active social lives among the elderly, and they should be supported for interacting with other individuals.

The limitations of this study are the fact that the study was conducted in the centre of a single province in the Eastern Black Sea Region, that it was studied with a cross-sectional method and a questionnaire, and that volunteers were included in the study.

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Author contribution:

Conception and design of the study: CY, and FG
Design and implementation of text-mining/NLP software: CY and FG
Acquisition of data: CY, and FG
Analysis of data: CY
Interpretation of data: CY, and FG
Drafting the manuscript: CY
Revising the manuscript: FG
Approval of the final version of the manuscript as submitted: CY, and FG.

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