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Health literacy levels and affecting factors among adults in Northeast Anatolia

Duygu Kavuncuoğlu, Zahide Koşan, Sinan Yılmaz, Serhat Vançelik

Ataturk University, Department of Public Health, Erzurum, Turkey

ORCID ID of the author(s)
DK: 0000-0002-0546-5478
ZK: 0000-0002-1429-6207
SY: 0000-0001-7784-3274
SV: 0000-0003-4244-602X

Corresponding Author
Duygu Kavuncuoğlu
Samandağ Health Directorate, Hatay, Turkey
E-mail: duygu_koylu@hotmail.com

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This study was approved by the Non-Interventional Clinical Research Ethics Committee of Atatürk University (decision no. 27.12.2018-8/21)..
All procedures in this study involving human participants were performed in accordance with the 1964 Helsinki Declaration and its later amendments.

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No conflict of interest was declared by the authors.

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Abstract

Background/Aim: Health literacy is individuals' wishes and capacities to develop their own opinions and make decisions regarding health services, their ability to maintain and promote their health, access health-related information, and interpret those messages and information correctly. Although health literacy began being discussed in the 1980s, its importance has become more apparent in recent years. However, greater research with regional and local data is still needed in this field. The purpose of this study was to determine levels of health literacy among adults in central districts of the Erzurum province, Turkey, and to examine the factors affecting these.

Methods: This cross-sectional study was performed with 864 individuals from the 15–65 age group living in Erzurum. The questionnaire employed in the research consisted of two parts: a personal information form and the Turkish Health Literacy Scale-32. The questionnaire was applied following receipt of participant consent. SPSS v 24 was used to enter and analyze the data. Descriptive statistics were expressed as percentage, mean, standard deviation, minimum, and maximum values. The chi-square test, Spearman's correlation analysis, and regression analysis were applied. Statistical significance was set at $P<0.05$.

Results: The mean age of the participants was 35.6 (13.0) years, and 55.8% were women. Additionally, 23.6% (n=204) of participants were educated to a primary school level or were uneducated, and 56.0% were not working in income-generating employment. Health literacy levels were inadequate in 24.1% of participants, problematic in 31.6%, adequate in 27.7%, and perfect in 16.6%. Health literacy levels varied significantly depending on participants' age groups ($P<0.001$), sex ($P=0.007$), education levels ($P<0.001$), possession of health insurance ($P<0.001$), presence of chronic disease in themselves or first-degree relatives ($P=0.002$ and $P<0.001$, respectively), and history of hospitalization exceeding 15 days ($P=0.026$).

Conclusion: The incidence of inadequate/problematic health literacy was 55.7%. Although it is not an expected rate for health literacy, this rate shows that only half of the population has a sufficient level and a significant inadequacy in health literacy. This shows that insufficient health literacy is widespread in Erzurum and that interventions aimed at health literacy are required in the province as in the country as a whole. Understanding the factors affecting health literacy is important in terms of improving health, health services planning, and intervention in these spheres.

Keywords: health literacy, THLS-32, health promotion

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Introduction

Health literacy is related to general literacy and refers to individuals' wishes and capacities to develop their own opinions and make decisions regarding health services throughout their lives, their ability to maintain and promote their health, to access health-related information in order to improve their quality of life and to correctly interpret those messages and information [1,2].

Health literacy is a concept defined within the framework of health improvement. It first appeared in a paper titled 'Health Education as Social Policy' by Scott Simonds in 1974. The concept of health improvement was defined at the International Conference on Health Promotion held in Canada in 1986 as 'enabling individuals to increase their control over and improve their health.' The concept of 'health literacy' was introduced to include the learning and perception of factors affecting health (health determinants) in addition to social, political, and economic conditions [3].

Health literacy allows individuals to acquire information, personal skills, and a level of self-confidence that encourages behavior that will improve their own health and that of the community by altering their lifestyle and living conditions [4]. It reinforces more effective use of existing health services, improved quality conditions in health services, and the individuals' competence in terms of their and the community's health [5,6]. Research has shown that inadequate health literacy is associated with increased hospitalization, greater use of emergency department services, less use of preventive health services, irregular drug use, poor comprehension of health-related messages, and a low level of health, particularly in the elderly [7,8].

Only 12% of adults in the USA are reported to possess sufficient health literacy [9]. A systematic review from 2009 examining 10 international studies reported prevalences of health literacy between 34% and 59% [10]. The 'Research into Turkish Health Literacy levels and Related Factors' in 2017 reported an insufficient literacy rate of 30.9% and a problematic-limited literacy rate of 38% [11].

Although health literacy began being discussed in the 1980s, its importance has become more apparent in recent years. The benefits of improving health literacy are now well-known worldwide. Various international scales measuring health literacy recently began being employed in Turkey [12–14]. However, greater research with regional and local data is still needed in this field.

This study aimed to determine levels of health literacy among adults in central districts of Erzurum province, Turkey, and to examine the factors affecting them.

Materials and methods

SThis descriptive, cross-sectional study was performed between May and September 2018 with the approval of the Atatürk University Non-Interventional Clinical Research Ethical Committee (decision no 27.12.2018–8/21).

The study population consisted of 348,217 individuals aged 15–65 living in central districts based on the 2017 Turkish Statistical Institute (TSI) data for Erzurum. A study sample of 630 individuals was calculated on Epi Info software based on a 30% prevalence of sufficient or perfect health literacy at a 95% confidence interval and a 3% margin of error. The sample size was increased by 25% against possible data losses, and we aimed to reach a total of 890 individuals. The study was performed using simple random sampling in 13 Family Health Centers (FHCs). Participants were enrolled from the FHCs in proportion to their population densities. Participants represented individuals presenting to FHCs and agreeing to take part.

Inclusion criteria were literacy, speaking Turkish, ability to communicate, and age between 15 and 65 years. Exclusion criteria were working in any health-related profession or occupation and inability to complete the questionnaire due to any health problem.

The data collection tool consisted of two parts: a personal information form and the Turkish Health Literacy Scale-32 (THLS-32). The dependent variable in the research was health literacy level, while independent variables included age, sex, education level, working in income-generating employment, health insurance, monthly family income, presence of chronic disease, presence of chronic disease in a first-degree relative, hospitalization for 15 days or longer, and receipt of education in health-related subjects.

THLS-32 was developed through the adaptation of the European Health Literacy Survey (HLS-EU) into the Turkish language by Okyay et al. [15] THLS-32 is structured as a 2 x 4 matrix with two domains (treatment and service, and protection from diseases/improvement of health) and four processes (access to health-related information, information understanding, information evaluation, and information use/application). THLS-32 consists of 32 five-point Likert-type propositions (1. Very easy, 2. Easy, 3. Difficult, 4. Very difficult, and 5. Don't know). As in the HLS-EU study, the indices are standardized between 0 and 50 at evaluation [Index=(mean-1) x (50 / 3)]. Health literacy is classified into four classes depending on the scores calculated (0–25=inadequate health literacy, 25–33=problematic / threshold health literacy, 33–42=adequate health literacy, and 42–50=perfect health literacy). The scale was validated by Okyay et al. [15], with a Cronbach alpha coefficient of 0.93 for the total scale, 0.88 for the first domain, and 0.86 for the second.

Statistical analysis

SPSS v.24 software was used for data entry and statistical analysis. Descriptive statistics were expressed as percentage, mean, standard deviation, minimum, and maximum values. The normal distribution of data was assessed using the Kolmogorov-Smirnov test. The χ^2 test, Spearman correlation analysis, and binary logistic regression analysis were applied. Independent variables included in the binary logistic regression analysis were selected from variables yielding significant results at univariate regression analysis and found to be significant in the relevant literature. The "Backward logistic regression (LR)" method was employed in regression analysis. *P*-values <0.05 were regarded as statistically significant.

Results

Eight hundred and sixty-four individuals were included in the study, a participation rate of 97.0%. The mean age of the participants was 35.6 (13.0) years (min=15, max=65), and 55.8% (n=482) were women. In terms of education levels, 23.6% (n=204) of participants were educated to a primary school level or were else uneducated. Fifty-six percent (n=484) of the study population was not in income-generating employment. The highest proportion of participants had sufficient income to meet their expenditures (44.3%). At least one chronic disease was present in 22.3% (n=193) of participants and in first-degree relatives of 36.1% (n=312). In addition, 13.3% (n=115) of participants had been hospitalized for 15 days or more, and 24.0% (n=207) had received education on a health-related subject. Participants' 16.2% sociodemographic and health-related characteristics are shown in Table 1.

Table 1: Distribution of participants' sociodemographic and health-related characteristics

Characteristic	No.	Percentage
Age group		
15 – 24	214	24.8
25 – 34	221	25.6
35 – 44	198	22.9
45 – 54	133	15.4
55 – 64	98	11.3
Sex		
Male	382	44.2
Female	482	55.8
Education level		
Primary school or below	204	23.6
Middle school	135	15.6
High school	260	30.1
Vocational school of higher education	52	6.1
University/school of higher education	178	20.6
Master's	29	3.4
Employment		
Not working	484	56.0
Occasional work	43	5.0
Working	337	39.0
Health Insurance		
No	94	10.9
General health insurance	762	88.2
Other	8	0.9
Income		
Less than outgoings	337	39.0
Equal to outgoings	383	44.3
Greater than outgoings	144	16.7
Presence of chronic disease		
Yes	193	22.3
No	671	77.7
Presence of chronic disease in a first-degree relative		
Yes	312	36.1
No	552	63.9
Hospitalization status		
Yes	115	13.3
No	749	86.7
Receipt of health education		
Yes	207	24.0
No	657	76.0

Cronbach alpha values of 0.90 for the THLS-32 'treatment and service' subdomain, 0.91 for the 'protection from diseases and improvement of health' subdomain,' and 0.94 for the total scale were determined in this study. Based on THLS-32 general scale scores, 24.1% (n=209) of the individuals participating in this study had inadequate health literacy, 31.6% (n=273) problematic health literacy, 27.7% (n=239) adequate health literacy, and 16.6% (n=143) perfect health literacy levels. Health literacy levels based on THLS-32 categories are shown in Figure 1.

Adequate/perfect health literacy levels were most prevalent in the 25 – 44 (55.2%) and 15 – 24 (53.7%) age groups, and significant differences were determined in health literacy distribution levels between age groups (χ^2=62.8, P<0.001). On the other hand, a weak, negative correlation was observed between participants' ages and index scores (r=-0.232, P<0.001). In terms of gender, the incidence of women with perfect health literacy levels (16.8%) was higher than that of men (16.2%), and health literacy distributions by gender were significantly different (χ^2=11.9, P=0.007). In terms of education levels, the incidence of adequate/perfect health literacy levels was highest among individuals educated to university level or above (60.0%), while the incidence of inadequate health literacy was highest among individuals educated to primary school levels or lower and with insufficient income (37.3%). Health literacy level distributions differed significantly in education levels (χ^2=73.8, P<0.001). In terms of employment status, the incidence of adequate/perfect health literacy levels was higher among individuals with income-generating employment (50.5%) compared to the unemployed (40.3%) and occasional workers (39.5%). However, participants' health literacy level distributions by employment status were similar (χ^2=12.4, P=0.053). The incidence of adequate/perfect health literacy levels was 52.8% among participants regarding their income as exceeding their outgoings, 42.9% among those with income equal to outgoings, and 42.1% among those with income less than outgoings. There was no statistically significant difference in health literacy level distributions regarding income status (χ^2=11.4, P=0.074). The incidence of adequate/perfect health literacy levels was higher among participants with health insurance (44.0%) than in those without (45.8%), and distributions differed significantly (χ^2=32.2, P<0.001).

The incidence of adequate/perfect health literacy levels among participants with at least one chronic disease (32.1%) was lower than that among individuals with no chronic disease (47.7%), and health literacy level distributions differed significantly (χ^2=14.9, P=0.002). The incidence of adequate/perfect health literacy levels among participants with chronic disease in a first-degree relative (33.0%) was lower than that in individuals with no chronic disease in first-degree relatives (50.6%), and the difference between distributions was statistically significant (χ^2=25.6, P<0.001). The incidence of adequate/perfect health literacy levels among participants with a history of hospitalization exceeding 15 days (37.4%) was lower than that in individuals with no history of hospitalization (45.3%), and the difference between health literacy levels was statistically significant (χ^2=9.2, P=0.026). The incidence of adequate/perfect health literacy levels among participants who had received health education on any subject (58.5%) was higher than that among individuals with no such education (39.8%), and the difference between health literacy levels was statistically significant (χ^2=26.0, P<0.001). A comparison of health literacy levels in terms of participants' sociodemographic and health-related characteristics is shown in Table 2.

Figure 1: Participants' health literacy levels based on THLS-32 categories

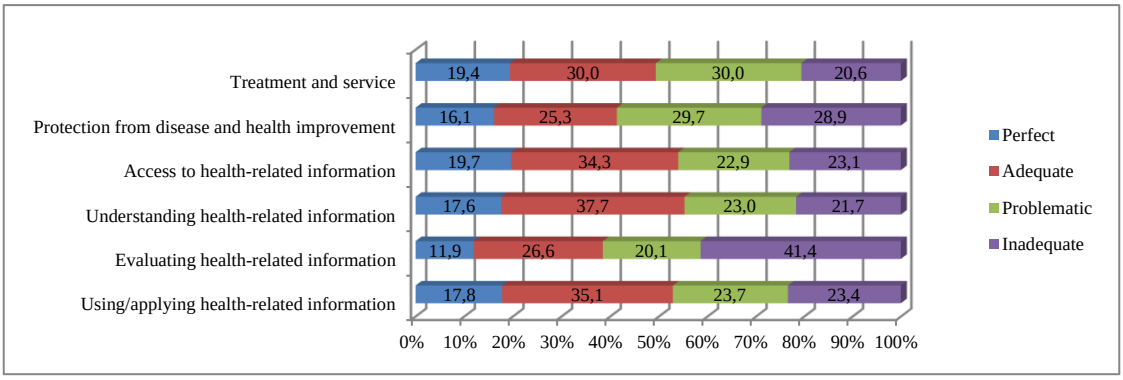

Table 2: A comparison of participants' health literacy levels by sociodemographic and health-related characteristics

		Inadequate		Problematic		Adequate		Perfect				
		n	%	n	%	n	%	n	%	Total	%	Statistics
Age groups	15–24	45	21.1	54	25.2	63	29.4	52	24.3	214	100	χ^2=62.8
	25–34	47	21.3	52	23.5	71	32.1	51	23.1	221	100	*P*<0.001
	35–44	43	21.7	71	35.8	62	31.4	22	11.1	198	100	
	45–54	41	30.8	55	41.4	23	17.3	14	10.5	133	100	
	55–64	33	33.7	41	41.8	20	20.4	4	4.1	98	100	
Sex	Female	98	20.3	171	35.5	132	27.4	81	16.8	382	100	χ^2=11.9
	Male	111	29.1	102	26.7	107	28.0	62	16.2	482	100	*P*=0.007
Education	Primary school or below	76	37.3	77	37.7	37	18.1	14	6.9	204	100	χ^2=73.8
	Middle school	36	26.7	39	28.9	32	23.7	28	20.7	135	100	*P*<0.001
	High school	64	24.6	84	32.3	78	30.0	34	13.1	260	100	
	University or above	33	12.5	73	27.5	92	34.7	67	25.3	265	100	
Health Insurance	Yes	178	23.1	253	32.9	227	29.5	112	14.5	770	100	χ^2=32.2
	No	31	33.0	20	21.2	12	12.8	31	33.0	94	100	*P*<0.001
Chronic disease	Yes	59	30.6	72	37.3	39	20.2	23	11.9	193	100	χ^2=14.9
	No	150	22.3	201	30.0	200	29.8	120	17.9	671	100	*P*=0.002
Chronic disease in first-degree relative	Yes	93	29.8	116	37.2	68	21.8	35	11.2	312	100	χ^2=25.6
	No	116	21.0	157	28.4	171	31.0	108	19.6	550	100	*P*<0.001
Receipt of health education	Yes	29	14.0	57	27.5	73	35.3	48	23.2	207	100	χ^2=26.01
	No	180	27.4	216	32.8	166	25.3	95	14.5	657	100	*P*<0.001

Discussion

In this research, 24.1% of participants had inadequate health literacy levels based on THLS-32 scores, while 58.5% had either inadequate or problematic literacy. In the Research into Turkish Health Literacy levels and Related Factors study, the incidence of inadequate health literacy was 30.9%, and that of inadequate/problematic literacy was 68.9% [11]. These findings show the widespread nature of inadequate/problematic health literacy representing an important public health problem. Inadequate/problematic health literacy levels between 48.2% and 82.8% have been reported in studies involving patients presenting to FHCs in different regions of Turkey [18,19]. Studies performed using the Test of Functional Health Literacy in Adults (TOFHLA) of individuals presenting to primary health institutions in Kosovo and Belgrade have reported inadequate health literacy levels of 86.6% and 46.4% [20,21]. The use of different scales by which health literacy levels are assigned to different categories in different studies makes direct comparison problematic. However, inadequate health literacy levels vary considerably depending on the communities involved.

The frequency of inadequate and inadequate/problematic health literacy categories in the protection from disease and improvement of health category in the present study was higher than that in the treatment and service dimension. Similarly to the present research, the Research into Turkish Health Literacy levels and Related Factors and studies performed in countries taking part in the Health Literacy Europe Research exhibited similar health literacy subdimension patterns among themselves, and inadequacy was again more frequent in the improvement of health subdomain [2, 11]. This may be related to services and interventions in the area of health improvement being more recent than health services. On the other hand, this may result from information sources intended to emphasize the relationship between health behaviors and outcomes or to bring about a change in health behaviors being perceived as more complex than information sources regarding the use of health services. The highest frequency of inadequate/problematic health literacy in terms of health-related information categories was determined in the evaluation category. This is consistent with all regions in the Research into Turkish Health Literacy Levels and Related Factors and different studies from Turkey [11,16–19]. Nevertheless, individuals with sufficient access to health-related information and with sufficient ability to apply existing information experience difficulty in evaluating health-related information, one component of health literacy. In order to overcome this difficulty, in addition to reliable and comprehensible sources of health information, they also require the self-sufficiency with which to assess it.

The elderly naturally constitute a significant part of the disease burden and health service use, and this burden is increasing as life expectancies increase. Health literacy levels, therefore, become more important with age. The incidence of inadequate/problematic health literacy levels in this study was 4.3% in the 15 – 24 age group but rose to 75.5% in the 55 – 64 age group. Two nationwide studies from Turkey also observed that mean health literacy scores decreased with age [11,22]. Findings from the HLS-EU and studies of adult health literacy in the USA similarly show that advancing age is a risk factor for health literacy [2,9]. The HLS-EU identified age as a powerful predictor of health illiteracy. A powerful negative correlation was observed between age and health illiteracy in Greece, Bulgaria, Poland, and Spain [2]. Paasche-Orlow et al.'s [23]

review of the data from 85 studies reported that studies with low mean ages had the lowest prevalences of inadequate health literacy. The fact that the elderly constitute a risk group for inadequate health literacy increases their vulnerability in different areas of health.

Gender is today regarded as one of the social determinants of health. Research shows that inadequate health literacy levels in men (29.1%) are higher than in women (20.3%), and literacy category distributions also differ between the sexes. Studies comparing health literacy in terms of gender have reported inconsistent findings, with some reporting better health literacy levels among men (20%). In contrast, others have reported that the female gender significantly increases the probability of an adequate level of health literacy [2,21]. The Research into Turkish Health Literacy Levels and Related Factors study and the Turkish Health Literacy Study reported that women were at a disadvantage in terms of adequate health literacy [11,24]. The HLS-EU determined that gender has a weak effect on health literacy and that levels were higher in women than in men in Holland, where the effect was greatest [2]. Paasche-Orlow et al.'s [23] review study reported no association between health literacy levels and sex. The fact that no relationship was revealed between health literacy and sex may be due to study populations having different characteristics (such as mean ages, education levels, and socioeconomic factors) and to societal gender variations.

Education is a precondition for health, although health is also a precondition for education. The incidence of inadequate/problematic health literacy was highest among participants educated to primary level or lower (75%) in this study, while that of adequate/perfect health literacy was highest among individuals educated to a university level or above (60%). Different studies from Turkey and elsewhere agree that education is important determinant of health literacy, with such literacy levels increasing in line with age [9,11,15,25]. Van der Heide et al. set out to explain the relationship between education and health literacy and to investigate the probable contribution of education to health literacy. Those authors noted the effect of education and health literacy on the role of three health indicators (declared health status, physical health status, and mental health status). That study presented powerful evidence that, while education and health literacy both affect health, health literacy is also affected by education [26]. The relationship between a low education level and poor health status can be explained by health literacy.

Regular income and employment is another important determinant of health status. No significant difference was determined in the present study between health literacy category distributions depending on working in income-generating employment and income status, although individuals with regular jobs and a better level of income also had higher health literacy levels. National and regional studies from Turkey have shown that individuals with regular jobs have higher levels of health literacy and that literacy levels rise in line with income [11,16,27]. Research involving individuals presenting to first-tier health services in Serbia showed that the working group comprised 8.7% of individuals with inadequate health literacy levels but 61.3% of those with adequate levels and that health literacy categories differed depending on employment status [21]. In the HLS-EU, full- and part-time workers had higher levels of health literacy than others, and limited health literacy levels were common among individuals with low social status [2]. Consistent with both domestic and international research, our study findings also show that the absence of regular income-generating employment and a low level of income are socioeconomic phenomena constituting risk factors in terms of health literacy.

The incidence of inadequate health literacy was higher (33.0%) among participants without health insurance in this research than among those with health insurance (23.1%). Domestic and regional studies from Turkey have also determined higher health literacy levels among individuals with health insurance than those without [11,27]. The fact that lack of health insurance is an important and one of the main factors restricting access to health services also increases the probability that this at-risk group will be disadvantaged in terms of health literacy.

Chronic diseases today result in more deaths than all other causes. Eighty-seven percent of deaths in Turkey between the ages of 30 and 70 derive from non-infectious diseases [11]. In the present study, inadequate/problematic levels of health literacy were more common (67.9%) among participants with chronic disease than among those without (52.3%). Inadequate/problematic levels of health literacy were also more common (67.0%) among individuals with chronic diseases in first-degree relatives than in those without (49.4%). Different studies from Turkey have also reported lower levels of health literacy among individuals with chronic diseases [11,16,27]. In the HLS-EU, the relationship between long-term health problems and general health illiteracy was assessed as important for seven countries other than Holland, and individuals with chronic diseases also had lower general health literacy index scores [2]. Studies from Germany and America have also found that inadequate health literacy is independently associated with poor physical and mental health [28,29]. Consistent with previous research, our findings also show an association between health literacy and the presence of chronic disease. Individuals with chronic diseases have lower health literacy. This may be due to lower mean age and higher education levels among individuals without chronic disease. On the other hand, there are also studies reporting that poor health literacy levels are associated with poor health outcomes even when demographic variables are brought under control [7]. All these findings show that the relationship between the presence of chronic disease and health literacy levels is a two-way interaction.

Inadequate health literacy also constitutes a risk factor for inefficient use of health services. The incidence of inadequate/problematic health literacy levels was higher (62.6%) in this research among individuals with histories of hospitalization exceeding 15 days than among individuals with no such history (54.7%). The HLS-EU determined a negative correlation between health literacy level and hospitalization, clinic presentation, and emergency department use [2]. Low health literacy levels are linked to a greater risk of hospitalization. Two review studies in the field of health literacy also concluded that inadequate levels of health literacy were associated with increased rates of hospitalization [30,31]. These

studies all show that inadequate health literacy is an obstacle to the appropriate and sufficient use of health services in all areas and tiers.

In the present study, the sufficient sample number calculated using an appropriate method in the 15 – 65 age group living in the province of Erzurum was achieved by weighting central district populations. In addition, the THLS-32 scale, with proven validity and reliability and an adaptation to the Turkish language and society of the HLS-EU scale widely used worldwide in this field, was used to measure participants' health literacy levels. However, because this study involved individuals presenting to FHCs, the results cannot be generalized to the entire community.

Conclusion and recommendations

The incidence of adequate/perfect health literacy in this study was 44.3%, while that of inadequate/problematic health literacy was 55.7%. This shows that insufficient health literacy is widespread in our community and that interventions aimed at health literacy are required in our province, and the country as a whole. The frequency of inadequate/problematic health literacy being greater in the field of protection from disease and health improvement (54.6%) than in that of treatment and service (50.6%) indicates that limited health literacy is a greater problem in the area of health improvement and that areas of intervention should be directed toward that field. Among the processes concerning health-related information, the frequency of inadequate/problematic health literacy was highest (54.0%) in the information evaluation process. This shows the importance of health education, which is central to all these endeavors and closely related to the improvement of health to achieve a sufficient ability to evaluate health-related information. Differences in health literacy levels that may vary between the genders among communities can be overcome by establishing gender equality in all societies and by men and women enjoying equal rights and opportunities. In addition, priority should be attached to measures aimed at older individuals with low education levels and chronic diseases in themselves or first-degree relatives, constituting a risk for low health literacy.

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