Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Public Health 200 (2021) 77–83

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Original Research

Differences in health literacy level of patients from public and private hospitals: a cross-sectional study in Turkey

V. Durmuş*

Institute of Health Sciences, Marmara University, Istanbul, Turkey

ARTICLE INFO

Article history:
Received 21 April 2021
Received in revised form
26 August 2021
Accepted 14 September 2021
Available online 25 October 2021

Keywords:
Health literacy
Hospitals
Health care
Turkey

ABSTRACT

Objectives: Policy-making based on a health literacy approach makes it a priority to develop people-centered public health strategies and programs, particularly in the time of COVID-19 across the world. This is the first study to assess health literacy levels of patients visiting public and private hospitals in Turkey and also compares these levels with sociodemographic and health-related variables by hospital type to suggest health policies aimed at improving the health literacy skills for patients with different socio-economic backgrounds.
Study design: This is a cross-sectional study.
Methods: The study was conducted on 948 outpatients from both hospital types in 2018. Health literacy was assessed using the validated Turkish version of the European Health Literacy Survey Questionnaire with 47 items. The level of health literacy and sociodemographic factors influencing it were analyzed using correlation and binary logistic regression tests. Patients from private hospital had better health literacy index score compared with the public hospital.
Results: The health-related variables, such as self-reported health and the presence of long-term illness, and sociodemographic characteristics, including education, age, and gender, were associated with health literacy for both public and private hospitals. Age and education were important predictors, whereas gender, long-term disease condition, self-reported health, and perceived income status were statistically significant variables for adequate health literacy in both hospital types.
Conclusions: Participants from private hospital had better health literacy than that of public hospital. These findings could be used to help health policy makers to improve the current health literacy policy for patients and develop strategies by stakeholders for reducing barriers to obtaining health-related information.

Introduction

Health literacy has been addressed in various studies as a range of skills individuals need to access, understand, and use basic health information to obtain better health outcomes.[1–3] Some studies expand the scope of health literacy to focus on patient-centered communication, disease prevention, and health-related behaviors.[4,5] The concept of health literacy seems to be very flexible, and more than 250 different definitions exist in the academic literature.[6] However, a widely accepted definition[7] of health literacy from the US Institute of Medicine is that the degree to which each person has the ability to acquire, interpret, and understand simple health information and services needed to make appropriate health decisions.[8] As included in most current definitions, this definition focuses on defining health literacy as an individual skill or ability. However, there is a growing recognition that health literacy is not solely an individual characteristic but also two sided, which means the possible contributions of those responsible for providing health information or of the attributes of health and health care settings.[9]

Although limited research has been done so far on health literacy for patients in Turkey, the importance of the issue is increasingly recognized in international health policy development.[10] Particularly, in the COVID-19 pandemic, efforts of health authorities and governments to improve health literacy for people can significantly help to reduce the infection transmission rate and to control the disease. Applying protective measures against infection with coronavirus, understanding of public health

* Tel.: +90 216 777 58 30; fax: +90 216 777 58 31
E-mail address: velidurmus@marun.edu.tr.

https://doi.org/10.1016/j.puhe.2021.09.016
0033-3506/

recommendations for mitigating the spread of COVID-19, and navigating COVID-19-related health information environments are currently of elevated importance.[11] A recent study have shown that higher health literacy levels have shown protective effects against COVID-19-related depression.[12] From this point, the present study will contribute to creating evidence on health literacy, especially in the time of COVID-19.

The purpose of the present study is to investigate the health literacy level of the adult patients from both types of hospitals where they are provided health care services in the same region. As each patient receiving health care service from these hospitals is different, the relationship between sociodemographic characteristics and health literacy will help identify vulnerable individuals with limited health literacy who are likely at risk for poorer health outcomes.[13] The research questions of this study, therefore, are (1) what are the differences in health literacy levels for patients receiving health care from private and public hospital, (2) to what extent are sociodemographic and health-related characteristics associated with the patients' health literacy level, and (3) to what extent do self-reported health predict health literacy by hospital type. As income-related equity in health literacy represents a potential opportunity to improve health outcomes,[14] it is also formulated the following research question: what extent do perceived income status predict health literacy of participants in both hospital types?

Methods

Study design and setting

The study was conducted on two different types of hospitals (public and private hospitals) with selecting a simple random sample of secondary healthcare services without replacement on the west side of Istanbul, Turkey, by using a cross-sectional descriptive approach. These hospitals were selected by assigning a random number to each hospital in sampling frame without biased regard to specific location or hospital organizational structure. Each hospital has the same probability of being chosen. In Turkey, public hospitals constitute 58% of all hospitals and 61% of all beds.[15] Approximately two-thirds of private hospitals in Turkey are located in Istanbul. There are slight differences in both hospital types with respect to the organizational and management characteristics. Private hospitals, predominantly profit-making organizations, are primarily funded by out-of-pocket payments and private insurances. Public hospitals, however, which operate with limited financial and management autonomy, are financed from both revolving funds and a line-item budget. Several studies in Turkey have shown that people with better socio-economic status primarily preferred private hospitals to receive quality healthcare services.[16–18] Private hospitals offer higher service quality and patient satisfaction level compared with public hospitals; however, a limited percentage of Turkish citizens can afford to use them.[17] These factors make two types of hospital-based patients receiving health care. Therefore, there is a crucial need to understand the correlates of health literacy levels between both types of patients to implement health policies aimed at reducing the differences in health literacy level for patients from both types of hospitals.

In both hospitals, the outpatient participants, visiting a hospital only for the medical treatment without staying there overnight, were asked to complete a 54-question survey about health literacy and sociodemographic characteristics. Only these participants who met inclusion criteria and were willing to participate in the study were included. Data were collected from outpatients visiting both hospitals from January to September 2018. By the end of the survey period, a total of 992 participants completed the survey, and 44 individuals were excluded from the study because they could not meet the inclusion criteria, skewed responses, or missing values. Finally, for the analysis, 948 participants were included in the study.

Characteristics and measurements

The instrument consists of two parts. First, the sociodemographic and health-related characteristics were collected from the questionnaire with seven items, such as gender, age, marital status, education level, self-reported health, long-term illnesses, and perceived income status. Second, health literacy was measured using the validated Turkish version of the European Health Literacy Survey Questionnaire (HLS-EU-Q47) with 47 items.[19]

The HLS-EU-Q47 is a conceptual model covering three health-related domains, such as health care, disease prevention, and health promotion. Within these domains, four cognitive skills focused on (1) accessing, or the ability to find and obtain information on health (13 items); (2) understanding, or the ability to comprehend information on health (11 items); (3) appraising, or the ability to evaluate and interpret information on health (12 items); and (4) applying, or the ability to use the information to improve health outcomes and health service responsiveness (11 items). Finally, all items constitute a general health literacy index providing a general picture and overview. The total score that can be obtained from the survey is between 47 and 188. To enable convenient calculations, the mean values of each index were standardized on a metric between 0 and 50 as in the HLS-EU study. The following formula retrieved from the report on health literacy[20] was used for this.

$$Index\ score = (Mean - 1) \times \left(\frac{50}{3}\right)$$

In this formula, mean is the mean of all participating items for each individual, 1 is the minimal possible value of the mean, 3 is the range of the mean, and 50 is the chosen maximum value of the new metric. The index score is categorized into four levels of health literacy: "inadequate" ($\leq$25), "problematic" (>25 to $\leq$ 33), "sufficient" (>33 to $\leq$ 42), and "excellent" (>42).

As provided in previous studies,[20,21] 47 items from a questionnaire were assessed using a 4-point rating scale with response categories ranging from very easy (4) to very difficult (1) to measure the perceived difficulty of the selected health-relevant tasks. In the present study, higher scores indicate better health literacy. Threshold values were defined as inadequate, problematic (which together also showed limited health literacy), sufficient, and excellent. The HLS-EU-Q47 refers to a self-perceived measure of health literacy and reflects the interactions between individual competencies and situational complexities or demands.[22] This should be taken into account when interpreting the survey results.

Statistical analysis

Sociodemographic characteristics and health-related variables difference among general health literacy were compared between hospitals using the Chi-squared test. Spearmen's significance test was performed to assess associations between health literacy and various variables, all non-parametric data. Descriptive analysis was conducted for the description of the mean scores and standard deviation of all the variables. Finally, binary logistic regression analyses were used to examine the extent to which various independent covariates may predict health literacy as dichotomized variables. In these analyses, inadequate and problematic health

literacy levels (limited health literacy) were coded as '0', and sufficient and excellent health literacy levels (adequate health literacy) were coded as '1'.

For the multivariate analyses, two models were used. The first model included gender, age, education, and long-term illnesses. The second model consisted of the first model plus self-reported health because of the mediating role of health literacy. Each model and analysis were performed for hospitals separately. To show a holistic view of the relationships, all variables were included in the models except for variable of marital status, indicating a weak relationship with the outcome variable. Finally, both types of hospitals were included in overall analysis of health literacy. The Hosmer–Lemeshow test was used to evaluate the goodness of fit for all models. The predictive strength of models was assessed using the Nagelkerke R-square. The results were presented as odds ratios with 95% confidence intervals (CIs) and p value. A p value of <0.05 was considered statistically significant, and all analyses were two sided. Data were analyzed using the IBM SPSS statistics 26 (Chicago, IL).

Results

Participant characteristics

Detailed characteristics and variables for the study population were presented in Table 1. Approximately half (53.1%) of the participants were females, and the average age of respondents was 38 years (±11 years). Most participants were aged <45 years from the public hospital and private hospital with a rate of 62% and 61.6%, respectively. Approximately two-thirds of respondents (64.6%) were married. Although more than half of participants (51.5%) from the public hospital were under the high school level, it was less than a half (44.9%) for a private hospital. Participants having inadequate perceived income status was significantly higher in public hospital (61.1%) than those in private hospital (44.7%, $P = 0.003$).

Distribution of health literacy by hospital

From the data in Table 2, most respondents from both hospitals generally had limited health literacy, although a higher percentage of the private hospital had sufficient and excellent health literacy levels (41%) compared with a public hospital (35.5%). Despite different participation rates, there were significant differences in the distributions of health literacy indices between hospitals. Moreover, these results indicated that limited health literacy was a serious problem mostly for participants from the public hospital (64.5%) compared with the private one (59%).

Factors associated with health literacy

From the Spearman correlation matrix (Table 3), general health literacy was correlated with some demographic and health-related variables, such as gender, age, education level, long-term illnesses, and self-reported health status. Although age was inversely and weak correlated ($r = -0.22$; $P < 0.01$) with general health literacy, the strongest association was with education ($r = 0.52$; $P < 0.01$), with higher education indicating higher health literacy. Lower

Table 1
Characteristics of the study participants.

Variables	Total (n = 948)	Public hospital (n = 492)	Private hospital (n = 456)	p value
	n (%)	n (%)	n (%)	
Gender				**0.025**
Male	445 (46.9)	219 (44.5)	226 (49.6)	
Female	503 (53.1)	273 (55.5)	230 (50.4)	
Age groups (years)				**0.005**
18–24	173 (18.2)	96 (19.5)	77 (16.9)	
25–34	211 (22.2)	111 (22.6)	100 (21.9)	
35–44	202 (21.3)	98 (19.9)	104 (22.8)	
45–54	154 (16.2)	75 (15.2)	79 (17.3)	
55–64	123 (12.9)	68 (13.8)	55 (12.1)	
≥65	85 (9.2)	44 (8.9)	41 (9.0)	
Mean (SD)	38.4 (±11.8)			
Education				**<0.001**
Literate	233 (24.6)	139 (28.3)	94 (20.6)	
Primary school	225 (23.7)	114 (23.2)	111 (24.3)	
High school	201 (21.2)	103 (20.9)	98 (21.4)	
Associate or Bachelor degree	188 (19.8)	91 (18.5)	97 (21.5)	
Master or higher degree	101 (10.7)	45 (9.1)	56 (12.2)	
Marital status				0.68
Married	613 (64.6)	330 (67.1)	283 (62.0)	
Non-married	335 (35.4)	162 (32.9)	173 (38.0)	
Long-term illnesses or health problem				**0.002**
Yes	238 (25.1)	144 (29.3)	94 (20.6)	
No	710 (74.9)	348 (70.7)	362 (79.4)	
Self-reported health status				**0.005**
Very bad	65 (6.9)	31 (6.3)	34 (7.4)	
Bad	87 (9.2)	52 (10.6)	35 (7.6)	
Fair	218 (23.0)	127 (25.8)	91 (20.0)	
Good	465 (49.1)	227 (46.1)	238 (52.2)	
Very good	113 (11.9)	55 (11.2)	58 (12.8)	
Perceived income status				**0.003**
Inadequate	505 (53.2)	301 (61.1)	204 (44.7)	
Moderate	341 (35.9)	149 (30.2)	192 (42.1)	
Adequate	102 (10.9)	42 (8.7)	60 (13.1)	

*Missing data not included; Chi-squared significances $P < 0.05$ are printed in bold.
SD, standard deviation.

Table 2
Proportions of different health literacy levels by hospital variables.

Health literacy levels		Private hospital (n = 456)				Public hospital (n = 492)				p value
		Inadequate (n = 112)	Problematic (n = 157)	Sufficient (n = 145)	Excellent (n = 42)	Inadequate (n = 129)	Problematic (n = 188)	Sufficient (n = 135)	Excellent (n = 40)	
		(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	
General HL		24.6	34.4	31.7	9.3	26.2	38.3	27.4	8.1	**0.002**
Healthcare literacy	Accessing	22.8	33.2	33.3	10.7	27.8	38.7	25.6	7.9	**0.006**
	Understanding	27.2	34.8	28.8	9.2	25.5	36.8	29.1	8.6	
	Appraising	27.3	36.1	28.7	7.9	29.8	38.8	24.2	7.2	
	Applying	23.0	35.9	33.1	8.0	24.3	37.5	30.3	7.9	
Disease prevention literacy	Accessing	26.7	35.8	27.9	9.6	27.3	39.3	25.4	8.0	**0.009**
	Understanding	21.9	33.1	35.1	9.9	23.2	36.7	31.2	8.9	
	Appraising	22.4	33.2	34.3	10.1	24.7	36.2	29.1	10.0	
	Applying	24.0	39.1	30.1	6.8	27.8	38.5	26.8	6.9	
Health promotion literacy	Accessing	21.6	36.4	33.8	8.2	25.5	35.1	29.6	9.8	**0.005**
	Understanding	27.8	36.8	27.9	7.5	28.9	40.4	26.3	4.4	
	Appraising	22.0	32.1	35.6	10.3	24.2	36.8	30.4	8.6	
	Applying	29.1	31.2	29.6	10.1	29.6	35.5	25.5	9.4	
HL index score		**31.7** (95% CI: 31.5–31.8)				**33.2** (95% CI: 33.0–33.5)				

*Missing data not included; Chi-squared significances $P < 0.05$ are printed in bold.
CI, confidence interval.

Table 3
Spearman correlation analysis among potential explanatory factors.

Variables	Min	Max	1	2	3	4	5	6	7	8
1. Gender[a]	1	2	1							
2. Age[b]	1	6	−0.10	1						
3. Education[c]	1	5	0.21[h]	−0.34[h]	1					
4. Marital status[d]	1	2	0.25	0.18	0.19	1				
5. Long-term illnesses[e]	1	2	0.14	0.36[i]	−0.24	0.11	1			
6. Self-reported health[f]	1	5	0.12	0.20[i]	0.31	0.09	−0.58[i]	1		
7. Perceived income	1	3	0.18	0.28[h]	0.21[h]	0.10	−0.15	0.23	1	
8. General health literacy[g]	1	4	0.20[h]	−0.22[i]	0.52[i]	0.13	0.40[i]	0.38[i]	0.35[i]	1

[a] 1 = male and 2 = female.
[b] 1 = 18–24 years and 6 = ≥65 years.
[c] 1 = literate and 5 = master or higher degree.
[d] 1 = married and 2 = non-married.
[e] 1 = yes and 2 = no.
[f] 1 = very bad and 5 = very good.
[g] 1 = very difficult and 4 = very easy.
[h] Correlation is significant at <0.05 level (two tailed).
[i] Correlation is significant at <0.01 level (two tailed).

perceived income group was also found to have lower health literacy level of participants ($r = 0.35$; $P < 0.01$).

In the multivariate logistic regression analyses with the final model (Table 4), those aged between 25 and 34 years compared with those aged ≥65 years from a public hospital were associated with adequate health literacy (odds ratio [OR] = 2.75; 95% CI 1.10–4.90). This was similar for those participants in the same age group from a private hospital (OR = 2.83; 95% CI 1.20–6.60). In overall analysis (model 2), hospital types were associated with having adequate health literacy (OR = 1.26; 95% CI 0.63–2.45). For both hospital types, participants having a master's degree or higher (OR = 3.21; 95% CI 1.81–6.55) in the public hospital and (OR = 4.12; 95% CI 2.40–6.85) private hospital, education level associated with adequate health literacy. Educational attainment, age groups, and perceived income status were positively associated with adequate health literacy in the overall sample. The multivariate model accounted for more than 51% (R-square) of the total variation of adequate health literacy. Its predictive value was higher for a private hospital (50.4%) than for the public hospital (48.2%), indicating that the adequate health literacy level of participants in the private hospital was influenced by these variables (Table 4).

Discussion

This empirical evidence study set out with the aim of examining the differences in health literacy level of participants receiving health services at public and private hospitals in Turkey and determines factors associated with adequate health literacy by hospital type. In 2016, Shanghai declaration on promoting health through sustainable development goals prioritized patient's empowerment by improving health literacy level. With this declaration, health literacy was highlighted as an integral part of the skills and competencies developed over a lifetime.[23] Therefore, this research sheds new light on the differences in health literacy level in patients from two types of hospitals to improve health literacy skills for people with different socio-economic backgrounds. Therefore, the topic of the effects of hospital types on individual health literacy levels or the role of health literate healthcare organization may be the subject of another study.

The consequences of limited health literacy are frequently discussed in the literature on health literacy.[7,24,25] This study is one of them that focused on the comparative health literacy level of patients from between hospital types. The results showed that the

Table 4
Odds ratios (ORs) of having adequate health literacy in the study population by hospital type.

Variables[a]		Public hospital		Private hospital		Overall[b]	
		Model 1[c]	Model 2[d] (final model)	Model 1	Model 2 (final model)	Model 1	Model 2 (final model)
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Gender	Male	1.23 (1.02–1.89)	1.15 (0.65–2.12)*	0.96 (0.50–1.85)	1.10 (0.64–2.11)*	1.40 (1.02–3.16)	1.13 (0.55–2.20)*
	Female	1	1	1	1	1	1
Age groups (years)	18–24	1.88 (0.65–3.46)**	1.80 (0.70–4.20)**	1.72 (0.48–3.60)**	1.82 (0.66–2.71)**	2.10 (1.15–3.60)**	2.15 (1.08–3.75)***
	25–34	2.91 (1.22–5.30)***	2.75 (1.10–4.90)***	2.02 (0.95–4.10)**	2.83 (1.20–6.60)*	3.02 (1.41–6.55)**	2.25 (1.10–4.20)***
	35–44	1.37 (0.44–2.17)	1.66 (0.55–3.15)**	1.55 (0.62–3.85)*	2.02 (0.95–5.10)*	2.70 (1.30–5.82)**	2.10 (0.70–4.05)*
	45–54	1.10 (0.35–2.92)	1.05 (0.40–2.86)	1.03 (0.35–2.75)	1.24 (0.64–2.30)*	1.66 (0.74–3.10)	1.20 (0.55–2.86)*
	55–64	0.76 (0.30–1.18)	0.60 (0.24–1.90)	0.51 (0.26–2.11)	0.48 (0.28–1.85)	0.65 (0.22–2.11)	0.70 (0.26–2.02)
	≥65	1	1	1	1	1	1
Education	MA or higher	3.27 (2.98–5.90)**	3.21 (1.81–6.55)***	3.35 (1.45–7.55)***	4.12 (2.40–6.85)***	4.40 (3.26–7.10)**	4.20 (3.10–6.75)***
	Assc. or BSc.	2.90 (2.33–5.20)**	2.92 (2.01–5.96)*	3.05 (1.80–6.84)**	3.85 (2.06–6.10)***	3.50 (2.10–6.30)***	3.45 (1.84–5.60)**
	High school	1.44 (0.75–2.20)*	1.49 (0.62–3.10)*	2.20 (0.95–5.10)*	2.60 (1.13–4.20)**	2.54 (1.78–3.41)*	2.40 (1.05–4.10)**
	Primary school	0.60 (0.18–1.65)*	0.55 (0.15–2.06)*	1.06 (0.38–3.30)	1.10 (0.45–2.15)	0.95 (0.44–2.11)*	1.04 (0.32–2.23)
	Literate	1	1	1	1	1	1
Long-term illnesses	No	1.20 (0.91–2.32)**	1.25 (0.95–2.56)*	1.31 (0.82–3.10)	1.27 (0.74–2.90)*	1.28 (0.65–1.96)*	1.35 (0.74–3.11)**
	Yes	1	1	1	1	1	1
Self-reported health	Very good		1.85 (0.82–5.60)**		2.23 (0.55–5.20)***		2.25 (0.95–4.18)**
	Good		1.53 (0.70–4.30)*		1.96 (0.92–4.82)*		1.85 (0.82–3.10)**
	Fair		1.10 (0.55–2.80)		1.23 (0.78–3.40)		1.30 (0.54–4.12)*
	Bad		0.76 (0.35–2.15)		0.62 (0.25–1.90)		0.80 (0.44–2.70)
	Very bad		1		1		1
Perceived income status	Adequate	2.11 (1.18–3.55)**	2.05 (1.10–3.40)**	2.22 (0.98–5.05)**	2.08 (0.73–4.04)***	2.13 (1.15–3.63)**	2.10 (1.11–3.60)**
	Moderate	1.55 (0.68–2.80)**	1.46 (0.42–2.57)*	1.60 (0.75–3.83)*	1.57 (0.66–3.81)**	1.61 (0.77–3.80)*	1.59 (0.74–3.88)**
	Inadequate	1	1	1	1	1	1
Hospital types	Private					1.31 (0.71–2.56)**	1.26 (0.63–2.45)**
	Public					1	1
Hosmer–Lemeshow, X^2 (p value)		7.29 (0.43)	5.42 (0.68)	9.30 (0.28)	4.45 (0.82)	6.34 (0.62)	8.72 (0.35)
Nagelkerke R^2		0.432	0.482	0.445	0.504	0.492	0.515

Assc., Associate degree; BSc., Bachelor degree; MA, Master degree
*$P < 0.05$. **$P < 0.01$. ***$P < 0.001$.
[a] Missing data not included.
[b] Included both type of hospitals.
[c] All the model 1 included explanatory factors: gender, age groups, education, marital status, long-term illnesses. All the model 2 (final model) included explanatory factors in model 1 plus self-reported health status.
[d] All of the model 2 (final model) included explanatory factors in model 1 plus self-reported health status.

majority of the study population (61.8%) had limited health literacy. The results of the previous studies in Turkey[10,19,21] were slightly different from the findings of the present study. These differences may partly be explained by two reasons. First, the sample size ranging from 500 to 6500 respondents was used in these studies. The sample size may affect the accuracy of the population estimate. Another reason could be that different sampling methods, improbable and stratification sampling techniques, and survey instruments were used in these studies from the different geographical regions or a place with a small population in Turkey. A study in 2018 also showed that health literacy outcomes varied by geographical locations of respondents.[10]

The health literacy index scores obtained from the present study were not considerably high compared with previous studies in Turkey.[10,19,21] A possible explanation for the differences of sufficient and excellent health literacy scores for respondents from both types of hospitals might be the economic status of individuals. Private hospitals are focusing much more on the quality of health services and profit-making compared with public hospitals. To receive the quality of medical care, the patients with perceived high-income levels are more likely to visit the private hospital than the public hospital. This social gradient in health behaviors is intensely supported by previous studies.[26–28] However, organizational health literacy to better respond and act on the health literacy requirements of population need to be focusing on reducing the demands and complexities of the health care organization. Health care organizations are able to empower the population they serve by providing health literacy–centered interventions and responsive structures and processes.[29] Therefore, further study is required to examine to what extent health organizations enable individuals to find, understand, and use information.

Individuals aged 25–34 years had better adequate health literacy than the other age groups in both hospital types when adjusting for other variables (i.e. age, education, and long-term illnesses). This seems in accordance with findings of former studies.[27,30–32] This finding might be attributable to an age-related decline of the ability to perform cognitive tasks that require information processing. Further research is needed to examine the main reason why the association between 25 and 34 years age group and health literacy.

Increasing education level was found to be associated with better adequate health literacy level for those receiving health services from both hospital types. This finding supports that the 25–34 years age group had better health literacy in the result of the present study because the potential age group of obtaining a master's degree or higher in Turkey is between this age group. Many research studies have shown that the overall level of

education is a predictor of health literacy.[21,25,30,31] It is worth noting that although a low level of education is a risk factor for limited health literacy, higher education level alone is not sufficient for adequate health literacy.[33]

As could be expected, the better the self-reported health, the fewer long-term illnesses were reported in the study. Previous studies confirmed these results.[34,35] Although some studies found that individuals with no chronic illnesses are reported to have higher health literacy scores compared with individuals with at least one chronic illness,[10,36] other studies reported that no statistical relation was found.[37,38] This inconsistency may be because of two reasons. First, it is seen as unnecessary for some individuals with chronic diseases to access or obtain information relevant to health because of the long-term effects of chronic diseases. Second, geographical differences in the region where the study was conducted may play a role in the health literacy level. This means that although some measures for health literacy might be appropriate for some issues, others may require a regional approach.

In the present study, self-reported health status is an important predictor of health literacy for both hospital types. This showed that respondents with better health literacy feel healthier. One striking finding is that self-reported health status seems to affect adequate health literacy levels for both hospital types. This leads to the assumption that this subjective indicator of perceived health status differs, in relation to health literacy, from the objective indicator of education. Comparison of the findings with those of other studies confirmed self-reported health condition was significantly associated with health literacy.[30,32] However, a previous study found that perceived health status was not a predictor variable for health literacy.[26] One important reason could be that the correlations might be spurious because of the presence of different subgroups of health literacy. Furthermore, health literacy and self-rated health may have many determinants in common.[20]

Limitations

This study has several limitations worth highlighting. First, because of the cross-sectional design, conclusions about causality cannot be drawn. Second, the generalizability of the sample is limited both because of the sampling coming from a single region in a city and using the simple random sample methodology. Third, although the health literacy level was assessed using a validated questionnaire in the study, it is comprised not only of reading and quantitative ability but also of interaction between knowledge, societal, and cultural influences that are difficult to measure.[8]

Conclusion

The health literacy level of participants from both types of hospitals was significantly predicted by factors such as gender, age, education, perceived health and income status, and long-term diseases condition. However, respondents from a private hospital had better health literacy than that of the public hospital by health literacy index scores. Furthermore, education seemed to be the salient predictor of health literacy levels in both hospitals. The results of this study should be taken into account by health policy makers and managers to mitigate the differences in health literacy level for patients from both types of hospitals. Continually improved strategies for health literacy should be designed to reduce the barriers to obtaining health-related information. In addition, for healthcare organizations, certain health literacy interventions, such as communication training for health professionals and supports patients to navigate, understand, and use information and services to take care of their health, could be a way to improve health literacy, particularly for patients with limited health literacy.

Author statements

Acknowledgments

None declared.

Ethical approval

Ethical approval was obtained from the Research Ethics Committee of Medical Sciences in both hospitals. This study was conducted in accordance with Helsinki Principles. Informed verbal consent was obtained from participants. It was explained to the participants that participation was completely voluntary and could be withdrawn at any point. On obtaining verbal consent, the participants independently filled in the questionnaire on health literacy without any names or identification items. Data obtained from all participants were kept confidential.

Funding

This research did not receive any specific grant from funding agencies in the public,commercial, or not-for-profit sectors.

Competing interests

None declared.

References

1. Lawless J, Toronto CE, Grammatica GL. Health literacy and information literacy: a concept comparison. *Ref Serv Rev* 2016;**44**(2):144–62. https://doi.org/10.1108/RSR-02-2016-0013.
2. Nutbeam D. The evolving concept of health literacy. *Soc Sci Med* 2008;**67**(12):2072–8. https://doi.org/10.1016/j.socscimed.2008.09.050.
3. World Health Organization (WHO). *Health promotion glossary*. 1998. https://www.who.int/healthpromotion/about/HPR Glossary1998.pdf.
4. Tenani CF, De Checchi MHR, Bado FMR, Ju X, Jamieson L, Mialhe FL. Influence of oral health literacy on dissatisfaction with oral health among older people. *Gerodontology* 2019;**37**(1):46–52. https://doi.org/10.1111/ger.12443.
5. Albus C. Health literacy: is it important for cardiovascular disease prevention? *Eur J Prev Cardiol* 2018;**25**(9):934–5. https://doi.org/10.1177/2047487318770519.
6. Malloy-Weir LJ, Charles C, Gafni A, Entwistle V. A review of health literacy: definitions, interpretations, and implications for policy initiatives. *J Publ Health Pol* 2016;**37**(3):334–52. https://doi.org/10.1057/jphp.2016.18.
7. McClintock H, Schrauben S, Andrews A, Wiebe D. Measurement of health literacy to advance global health research: a study based on Demographic and Health Surveys in 14 sub-Saharan countries. *Lancet Glob Heal* 2017;**5**:S18. https://doi.org/10.1016/s2214-109x(17)30125-0.
8. Institute of Medicine (US) Committee on Health Literacy. In: Nielsen-Bohlman L, Panzer A, Kindig D, editors. *Health literacy*. National Academies Press; 2004. https://doi.org/10.17226/10883.
9. Pleasent A, Rudd RE, O'Leary C, et al. *Considerations for a new definition of health literacy*. 2016. http://nam.edu/wp-content/uploads/2016/04/Considerations-for-a-New-Definition-of-Health-Literacy.pdf.
10. Ministry of Health of Turkey. *Türkiye sağlık okuryazarlığı düzeyi ve İlişkili faktörleri araştırması*. 2018. https://dosyamerkez.saglik.gov.tr/Eklenti/31374,turkiye-saglik-okuryazarligi-duzeyi-ve-iliskili-faktorleri-arastirmasipdf.pdf?0. [Accessed 20 May 2020].
11. Okan O, Bollweg TM, Berens E-M, Hurrelmann K, Bauer U, Schaeffer D. Coronavirus-related health literacy: a cross-sectional study in adults during the COVID-19 infodemic in Germany. *Int J Environ Res Publ Health* 2020;**17**(15):5503. https://doi.org/10.3390/ijerph17155503.
12. Nguyen HC, Nguyen MH, Do BN, et al. People with suspected COVID-19 symptoms were more likely depressed and had lower health-related quality of life: the potential benefit of health literacy. *J Clin Med* 2020;**9**(4):965. https://doi.org/10.3390/jcm9040965.
13. Berkman ND, Sheridan SL, Donahue KE, Halpern DJ, Crotty K. Low health literacy and health outcomes: an updated systematic review. *Ann Intern Med* 2011;**155**(2):97. https://doi.org/10.7326/0003-4819-155-2-201107190-00005.
14. Tang C, Wu X, Chen X, Pan B, Yang X. Examining income-related inequality in health literacy and health-information seeking among urban population in

China. *BMC Publ Health* 2019;**19**(1):221. https://doi.org/10.1186/s12889-019-6538-2.
15. Küçük A, Özsoy VS, Balkan D. Assessment of technical efficiency of public hospitals in Turkey. *Eur J Publ Health* 2020;**30**(2):230–5. https://doi.org/10.1093/eurpub/ckz143.
16. Taner T, Antony J. Comparing public and private hospital care service quality in Turkey. *Leader Health Serv* 2006;**19**(2):1–10. https://doi.org/10.1108/13660750610664991.
17. Yalçın İ, Sedat U. Measurement of service quality in health sector: a comparison between public and Turkish private hospitals in Kosovo. *Hitit Univ J Soc Sci Inst* 2020;**13**(2):368–84. https://doi.org/10.17218/hititsosbil.801342.
18. Çaha H. Service quality in private hospitals in Turkey. *J Econ Soc Res* 2007;**9**(1):55–69.
19. Durusu-Tanrıöver M, Yıldırım HH, Demiray-Ready FN, Çakır B, Akalın HE. *Türkiye sağlık okuryazarlığı araştırması*. 2014. http://www.sagliksen.org.tr/cdn/uploads/gallery/pdf/8dcec50aa18c21cdaf86a2b33001a409.pdf. [Accessed 16 April 2020].
20. HLS-EU Consortium 2012. *Comparative report of health literacy in eight EU member states*. The European Health Literacy Survey HLS-EU; 2014. http://www.health-literacy.eu.
21. Abacıgil F, Horlak H, Okyay P. *Türkiye sağlık okuryazarlığı ölçekleri güvenilirlik ve geçerlilik çalışması*. Ministry of Health of Turkey Publication No:1025; 2016. https://sbu.saglik.gov.tr/Ekutuphane/Home/GetDocument/530. [Accessed 11 June 2020].
22. Sørensen K, Van den Broucke S, Fullam J, et al. Health literacy and public health: a systematic review and integration of definitions and models. *BMC Publ Health* 2012;**12**(1):80. https://doi.org/10.1186/1471-2458-12-80.
23. World Health Organization (WHO). Shanghai declaration on promoting health in the 2030 agenda for sustainable development. *Health Promot Int* 2017;**32**(1):7–8. https://doi.org/10.1093/heapro/daw103.
24. Edwards M, Wood F, Davies M, Edwards A. The development of health literacy in patients with a long-term health condition: the health literacy pathway model. *BMC Publ Health* 2012;**12**(1):130. https://doi.org/10.1186/1471-2458-12-130.
25. Davis SN, Wischhusen JW, Sutton SK, et al. Demographic and psychosocial factors associated with limited health literacy in a community-based sample of older Black Americans. *Patient Educ Counsel* 2019;**103**(2):385–91. https://doi.org/10.1016/j.pec.2019.08.026.
26. Jeong SH, Kim HK. Health literacy and barriers to health information seeking: a nationwide survey in South Korea. *Patient Educ Counsel* 2016;**99**(11):1880–7. https://doi.org/10.1016/j.pec.2016.06.015.
27. Svendsen MT, Bak CK, Sørensen K, et al. Associations of health literacy with socioeconomic position, health risk behavior, and health status: a large national population-based survey among Danish adults. *BMC Publ Health* 2020;**20**(1):1–12. https://doi.org/10.1186/s12889-020-08498-8.
28. Persell SD, Karmali KN, Lee JY, et al. Associations between health literacy and medication self-management among community health center patients with uncontrolled hypertension. *Patient Prefer Adherence* 2020;**14**:87–95. https://doi.org/10.2147/PPA.S226619.
29. De Gani SM, Nowak-Flück D, Nicca D, Vogt D. Self-assessment tool to promote organizational health literacy in primary care settings in Switzerland. *Int J Environ Res Publ Health* 2020;**17**(24):9497. https://doi.org/10.3390/ijerph17249497.
30. Klinker CD, Aaby A, Ringgaard LW, Hjort AV, Hawkins M, Maindal HT. Health literacy is associated with health behaviors in students from vocational education and training schools: a Danish population-based survey. *Int J Environ Res Publ Health* 2020;**17**(2). https://doi.org/10.3390/ijerph17020671.
31. Todorovic N, Jovic-Vranes A, Djikanovic B, et al. Assessment of health literacy in the adult population registered to family medicine physicians in the Republic of Srpska, Bosnia and Herzegovina. *Eur J Gen Pract* 2019;**25**(1):32–8. https://doi.org/10.1080/13814788.2019.1571579.
32. Amoah PA, Phillips DR. Socio-demographic and behavioral correlates of health literacy: a gender perspective in Ghana. *Women Health* 2019:1–17. https://doi.org/10.1080/03630242.2019.1613471. 0(00).
33. Shah LC, West P, Bremmeyr K, Savoy-Moore RT. Health literacy instrument in family medicine: the "newest vital sign" ease of use and correlates. *J Am Board Fam Med* 2010;**23**(2):195–203. https://doi.org/10.3122/jabfm.2010.02.070278.
34. Shiyanbola OO, Unni E, Huang YM, Lanier C. The association of health literacy with illness perceptions, medication beliefs, and medication adherence among individuals with type 2 diabetes. *Res Soc Adm Pharm* 2018;**14**(9):824–30. https://doi.org/10.1016/j.sapharm.2017.12.005.
35. Heijmans M, Waverijn G, Rademakers J, van der Vaart R, Rijken M. Functional, communicative and critical health literacy of chronic disease patients and their importance for self-management. *Patient Educ Counsel* 2015;**98**(1):41–8. https://doi.org/10.1016/j.pec.2014.10.006.
36. Ergün S. Health literacy in school of health students. *Kocaeli Med J* 2017;**6**(3):1–6.
37. Çimen Z, Bayık Temel A. Investigation the relation between health literacy and perception of health and effective factors on health literacy in older people with chronic illness. *J Ege Univ Nurs Fac* 2017;**33**(3):105–25.
38. Yakar B, Gömleksiz M, Pirinççi E. Health literacy levels and affecting factors of patients who applied to A university hospital polyclinic. *Eurasian J Fam Med* 2019;**8**(1):27–35. https://doi.org/10.33880/ejfm.2019080104.