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Functional health literacy in a group of Turkish patients: A pilot study

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Abstract: *Background:* There is currently no objective original measure developed in the Turkish language for evaluating health literacy. However, some instruments originally developed in Western countries and translated into Turkish do exist. *Aims:* The aim of this study was to translate and adapt the Test of Functional Health Literacy (TOFHLA) into the Turkish language and validate it among a group of Turkish patients. *Methods:* Interviews were held in an outpatient clinic. Illiterate patients, those with previously diagnosed mental illness and inadequate visual acuity were excluded. *Results:* Internal consistencies of the reading comprehension and numeracy items were 0.89 and 0.77 respectively. Inadequate health literacy was determined in 28.0% of participants, marginal in 30.0% and adequate in 42.0%. Among the possible socio-demographic predictors of health literacy, the most significant predictor was the educational level. Participants with lower levels of education had significantly lower levels of health literacy. In general, reading comprehension scores were lower than the numeracy scores. The most disadvantaged groups were

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PUBLIC INTEREST STATEMENT

Functional Health Literacy has two parts:

- (1) Numeracy is the patient's ability to understand and act on numerical directions given by the health care provider. For example receiving, following and paying for medication plans.
- (2) Reading comprehension is the patient's ability to read and understand the printed medical instructions, patient rights and responsibilities written on the insurance or informed consent forms or where, when and how to apply for the next appointment. Patients with "Adequate Functional Health Literacy" can read, understand and interpret most of the printed materials which are given them in the health care facilities.

Patients with "Marginal or Inadequate Functional Health Literacy" will have difficulty in reading, understanding and interpreting those kinds of printed materials furthermore they will not be able to take their medications correctly or to follow prescribed treatment regimes.

Low functional health literacy is a barrier against proper health care. Therefore health care providers must be aware of patients with marginal or inadequate health literacy.

women and older people (≥ 40 years of age) because of their lower levels of education. *Discussion:* The TOFHLA in the Turkish language seems to be a valid measure. Functional health literacy was found to be inadequate or marginal. Without enhancing the overall educational level, especially of women, efforts to improve health literacy seem to be ineffective. *Conclusions:* Functional health literacy is related to education. Non-written visual materials should be considered as a temporary solution to improve health literacy in populations with low literacy.

Subjects: Adult Education; Educational Research; Language & Communication Difficulties; Education & Development; Preventative Medicine; Community Health; Health Communication; Health Education and Promotion

Keywords: functional health literacy; health communication; reading ability; numeracy skill; low literacy level

1. Introduction

Although there are several definitions of health literacy in literature, there is no currently commonly accepted definition (Berkman, Davis, & McCormack, 2010; Frisch, Camerini, Diviani, & Schulz, 2012; Institute of Medicine, 2004; Nutbeam, 2009; Peerson & Saunders, 2009; Sørensen et al., 2012; The National Academies of Sciences, Engineering & Medicine, 2015; WHO, 1998). Health literacy represents the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health (WHO, 1998).

Health literacy is a multidimensional concept and has at least seven dimensions of functional literacy, factual and procedural knowledge, awareness, a critical dimension, an affective dimension and attitudes (Frisch et al., 2012). Functional health literacy refers to the reading, writing and numeracy abilities which are essential to function effectively in everyday situations (Nutbeam, 2000). Adequate functional health literacy means being able to apply literacy skills to health-related materials such as prescriptions, appointment cards, drug labels and directions for utilizing the healthcare (Parker, Baker, Williams, & Nurss, 1995).

Patients with inadequate functional health literacy are less likely to understand their diagnoses and treatments and they may have lower rates of appointment compliance (Berkman et al., 2004; Busch, Martin, DeWalt, & Sandler, 2015; Davis, Williams, Marin, Parker, & Glass, 2002; Heijmans, Waverijn, Rademakers, van der Vaart, & Rijken, 2015; Miller, 2016; Sanders et al., 2014; Suka et al., 2015; Wagner, Knight, Steptoe, & Wardle, 2007; Williams, Baker, Parker, & Nurss, 1998; Wong et al., 2014).

By improving people's access to health information and their capacity to use it effectively, functional health literacy is critical to empowerment. Functional health literacy is somehow dependent upon more general levels of literacy. Poor literacy can affect people's health directly by limiting their personal, social and cultural development as well as hindering the development of health literacy itself.

Poor general literacy is very common in Turkey, with the mean duration of education corresponding to a period of 7.6 years (female 6.7 years; male 8.5 years) and 50.6% of the population aged 25 years and over have not undergone secondary education (Human Development Report, 2015). In terms of education, women are a disadvantaged group: 39.0% of the female population aged 25 years and over have had some secondary education, whereas this percentage is 1.5 times higher for the male population (Human Development Report, 2015). Most of the people who cannot read and write are female and for every man who cannot read and write there are five women. These poor literacy levels affect people's health directly and limit their functional health literacy.

Health literacy in Turkey is not a well-studied subject and there are few papers in literature. These papers have reported educational attainment to be the most important demographic characteristic related to health literacy (Eyüboğlu & Schulz, 2016; Ozdemir, Alper, Uncu, & Bilgel, 2010). One of these studies used the Rapid Estimate of Adult Literacy in Medicine (REALM) and Newest Vital Sign (NVS) instruments to measure health literacy and found that according to the REALM scores, 58.7% of the participants had adequate health literacy whereas this percentage was 28.1% in terms of NVS scores (Ozdemir et al., 2010). Another study used the short version of the Test of Functional Health Literacy in Adults (S-TOFHLA) and found the rate of adequate health literacy to be 37.0% (Eyüboğlu & Schulz, 2016). A study of school teachers in Turkey found that 26.2% of primary and secondary school teachers had an adequate level of health literacy according to the NVS scores (Yilmazel & Cetinkaya, 2015).

We chose to undertake this study because:

- (1) Inadequate health literacy affects large numbers of people in developing countries such as Turkey.
- (2) The prevalence of chronic diseases is increasing in Turkey, and health literacy plays an important role in the self-management of chronic diseases.
- (3) Previous studies showed a clear correlation between inadequate health literacy and poor health outcomes. For the prevention of those unwanted health consequences, measuring health literacy is important.
- (4) Limited health literacy causes additional health care costs. Measuring health literacy and implementing preventive measures to improve it will be helpful in reducing these costs.
- (5) The mismatch between the reading level of health-related materials and the reading comprehension of the patients increases health information demands. Measuring health literacy will show what type and amount of health information is needed. Addressing the demands of patients with different levels of health literacy will allow for equity in health care.

This study has two objectives:

- (1) Translation and validation of the Test of Functional Health Literacy in Adults (TOFHLA) in the Turkish language. To the best of our knowledge, the long version of TOFHLA has not been previously translated and validated for the Turkish language.
- (2) Measurement of functional health literacy levels of Turkish patients attending an outpatient clinic for general surgery and assessing the possibly related socio-demographic factors.

Hypotheses of this study are:

- (1) The Turkish version of the Test of Functional Health Literacy in Adults is a valid instrument for assessing functional health literacy in Turkish adults.
- (2) There is a relation between functional health literacy and some socio-demographic factors such as age, gender and level of education.

2. Methods

This cross-sectional study was performed in 2015, at a university hospital located in the fourth largest city of Turkey. Approval for the study was granted by the Ethics Committee of the corresponding university (Approval date: 01.13.2015, number: 2015-1/1). Study participants were adult patients who attended the outpatient clinic for general surgery of the corresponding hospital. Participation in the study was voluntary and anonymous. All participants gave written consent for participation. Patients with diagnosed cognitive impairment, inadequate visual acuity and those who could not read and write were excluded from the study.

The study instrument for measuring functional health literacy was the TOFHLA. The license to reproduce the TOFHLA for use in research was given to one of the authors (License Number: 65/12; date: June 22, 2012). The TOFHLA was translated into Turkish by the standard translation back-translation process. All items of the original TOFHLA, both in terms of reading comprehension and numeracy sections, were culturally accepted and considered relevant in a Turkish context; therefore, no changes were made to the original items of the instrument. The Turkish TOFHLA was administered as a print version with 12 point font.

The TOFHLA Reading Comprehension test evaluates a patient's ability to read passages using real materials from a healthcare setting. The test has 50 items and three passages which are selected from instructions for preparation for an upper gastro intestinal series, the patient rights and responsibilities section of a health insurance application form, and a standard hospital informed consent form. The three passages are arranged in increasing order of difficulty (Parker et al., 1995; Williams et al., 1995). In the Turkish version of the instrument, the three passages and items are in the same order as the original TOFHLA and participants were asked to choose the right answer from four multiple-choice options to fill out the blank lines. The test was stopped at the end of 12 min and the test material was removed. The answers were compared by page and variable name to the appropriate scoring key. In the score box, "1" for correct, "0" for incorrect or blank answers were circled. The total of the correct answers gave the score for the TOFHLA Reading Comprehension.

The patient's ability to understand and act on numerical directions given by the health care personnel is a significant measurement of functional health literacy and this ability is measured by the TOFHLA Numeracy test. The TOFHLA Numeracy section has 17 items which are about prescription vials, blood glucose test results, appointment slips, and eligibility for financial aid (Parker et al., 1995; Williams et al., 1995). These items are arranged in increasing levels of difficulty and were to be answered in 10 min. Once the test ended, after the 10 min time limit, the test material was removed. The answers were compared to the appropriate scoring key. In the score boxes, "1" for correct, "0" for incorrect or blank answers were circled. The total of correct answers gave the raw score for TOFHLA Numeracy. The numeracy raw score was converted to numeracy weighted score by using the numeracy raw scores/weighted scores equivalent table given in the manual "Directions for Administration & Scoring TOFHLA" (Nurss, Parker, Williams, & Baker, 2001).

The sum of the scores of the reading and numeracy sections of TOFHLA yields the total TOFHLA score, which ranges from 0 to 100. A total TOFHLA score of 0–59 is labeled as "inadequate functional health literacy" which means "unable to read and interpret health texts". A total TOFHLA score of 60 to 74 is labeled as "marginal functional health literacy", which means "has difficulty reading and interpreting health texts", and a total TOFHLA score of 75 to 100 is labeled as "adequate functional health literacy", which means "can read and interpret most health texts" (Nurss et al., 2001). People with marginal or inadequate functional health literacy will have difficulty reading, understanding and interpreting most health materials. As such, they are neither going to be able to read and understand directions for their healthcare (Nurss et al., 2001), nor are they likely to take their medications correctly or follow prescribed diets and treatment plans (Nurss et al., 2001).

In addition to the TOFHLA, the participants completed another questionnaire regarding their socio-demographic characteristics (age, gender, economic status, and years of schooling) and responded to these questions:

- (1) If the healthcare provider gives me forms to fill out
 - (a) I always read and complete them by myself
 - (b) I ask for someone's help to read and complete them
- (2) I understand the printed material which is given to me by the health care provider

- (a) Always
- (b) Sometimes
- (c) Never

We used, for the analyses, the IBM SPSS Statistics 22 program licensed to the corresponding university. Descriptive statistics, chi square, correlation and binary logistic regression analyses were performed.

3. Results

The internal consistency reliability of TOFHLA was high (Cronbach’s α Total = 0.91; Reading = 0.89; Numeracy = 0.77). In the TOFHLA Reading Comprehension test, the majority of the participants answered the items regarding instructions for preparation for an upper GI series correctly. Two items of this section (the day before the X ray: for supper have only **toast** and after **midnight** do not eat and drink) were answered incorrectly by most of the participants (80.7 and 70.0% respectively). Items in the rights and responsibilities section were also answered correctly by the majority of the group. Most of the incorrect answers were obtained from the hospital consent form section and, in this section. 8 out of 14 items were answered incorrectly by more than half of the participants.

According to the results obtained from the numeracy section of the TOFHLA, many patients were unable to understand instructions on medication bottles and were unable to explain how to take medications correctly. After examining a standard appointment slip, 86.0% of participants could describe the time of the follow-up appointment and 76.7% knew the correct place to go for the follow-up appointment. However, the question of being eligible for financial assistance was answered incorrectly by 31.3% of the patients.

The correlations between the scores of total TOFHLA, total reading comprehension, separate scores for three passages and weighted numeracy levels are shown in Table 1.

A significant correlation was determined between the reading comprehension and numeracy scores of TOFHLA, with a correlation coefficient of $r = 0.569$ ($p < 0.0001$; 95% CI = 0.4503–0.6687).

The functional health literacy levels and characteristics of participants completing the TOFHLA are shown in Table 2.

Functional health literacy was determined as inadequate in 28.0% of the participants, marginal in 30.0% and adequate in 42.0%. This means that more than half of the study group was functionally illiterate in terms of health corresponding issues. Of the participants with inadequate and marginal health literacy, 81.6% (71/87) reported that they always read and completed the printed materials by themselves, although 47.1% (41/87) stated that they did not always understand these materials.

Table 1. Correlations between TOFHLA and its sub-dimensions

	TOFHLA total score	Reading comprehension score	Passage A score	Passage B score	Passage C score
Reading comprehension score	0.858				
Passage A score	0.770	0.899			
Passage B score	0.780	0.881	0.709		
Passage C score	0.707	0.849	0.649	0.657	
Weighted numeracy score	0.911	0.569	0.510	0.541	0.450

Note: All correlations were significant at the 0.01 level.

Table 2. Functional health literacy levels and some characteristics of the participants

Characteristics	Functional health literacy levels			
	Inadequate (N = 42)	Marginal (N = 45)	Adequate (N = 63)	Total (N = 150)
Age group, N (%)				
20–39 years	11 (26.2)	19 (42.2)	38 (60.4)	68 (45.3)
40–59 years	20 (47.6)	20 (44.4)	17 (26.9)	57 (38.0)
≥60 years	11 (26.2)	6 (13.4)	8 (12.7)	25 (16.7)
Gender, No (%)				
Male	14 (33.3)	18 (40.0)	40 (63.5)	72 (48.0)
Female	28 (66.7)	27 (60.0)	23 (36.5)	78 (52.0)
Self reported economic status, No (%)				
Good	3 (7.1)	4 (8.9)	17 (27.0)	24 (16.0)
Moderate	34 (81.0)	39 (86.7)	44 (69.8)	117 (78.0)
Poor	5 (11.9)	2 (4.4)	2 (3.2)	9 (6.0)
Years of school education, No (%)				
≤8	35 (83.3)	21 (46.7)	5 (7.9)	61 (40.7)
9–12	6 (14.3)	20 (44.4)	22 (34.9)	48 (32.0)
>12	1 (2.4)	4 (8.9)	36 (57.2)	41 (27.3)
Attitudes regarding printed materials given by the healthcare provider				
I always read and complete them by myself	32 (76.2)	39 (86.7)	62 (98.4)	133 (88.7)
I ask for someone's help to read and complete them	10 (23.8)	6 (13.3)	1 (1.6)	17 (11.3)
Understandability of the printed material				
I always understand the printed material	17 (40.4)	29 (64.4)	53 (84.1)	99 (66.0)
I sometimes/never understand the printed material	25 (59.6)	16 (35.6)	10 (15.9)	51 (34.0)

Of the participants with inadequate and marginal health literacy and those who reported that they always read the printed materials by themselves, 42.3% (30/71) pointed to the fact that they did not understand these materials.

Inadequate and marginal functional health literacy was more frequent among women (70.5%) than among men (44.5%), among participants ≥40 years of age (69.5%) than among participants <40 years of age (44.1%), and among participants with a lower level of school education (91.8%) than those with more school education. In fact, the higher proportions of inadequate and marginal functional health literacy among women and older participants were due to the fewer years of school education among these groups. The difference in the distribution of male and female participants according to education was statistically significant ($\chi^2 = 14.723$; $df = 2$; $p = 0.001$). Among participants with ≤8 years of education, 71.0% were female and 29.0% were male. The difference between the distribution of participants according to education and age groups was also found to be statistically significant ($\chi^2 = 10.964$; $df = 4$; $p = 0.02$). Of the participants with ≥12 years of education, 66.0% were in younger age groups. Binary logistic regression analysis between the socio-demographics (age, gender, schooling years, economic and marital status) and functional health literacy (inadequate and marginal health literacy = 0, adequate health literacy = 1) revealed that only the years of education had an impact on functional health literacy. While the latter was 7.8 times higher in

participants with 9–12 years of education, participants with >12 years of education had 71 times more adequate health literacy than those with ≤8 years of schooling.

Most of the participants (88.7%) reported that they always read and completed, on their own, the printed material given by the healthcare provider, although 53.4% of these individuals had inadequate or marginal health literacy. Therefore, it can be assumed that they may not have been able to understand the printed material. In addition, 66.0% of the study group reported that they could always understand the printed material, although 46.5% of this group had inadequate or marginal health literacy. This conflicting result could be due to the reporting bias and raises questions about the accuracy of the results of self-reported health literacy studies.

The mean, median scores for functional health literacy are shown in Table 3.

The mean TOFHLA score for the whole group was 69.0 (16.5), which pointed to marginal functional health literacy. The mean numeracy score was higher than the mean score for reading comprehension and this pattern was the same for the different age groups, for both males and females, and for different educational status and educational attainment. Those in the younger age groups, in good

Table 3. Mean (SD), median scores of TOFHLA and some characteristics of the participants

	Reading score		Numeracy score		TOFHLA score	
	Mean (SD)	Median	Mean (SD)	Median	Mean (SD)	Median
Age group						
20–39 years	35.6 (8.5)	38.0	37.5 (10.3)	39.0	73.1 (17.7)	77.0
40–59 years	31.8 (7.5)	33.0	34.2 (8.9)	33.0	66.0 (13.8)	67.0
≥60 years	30.5 (7.9)	30.0	34.3 (12.9)	36.0	64.8 (16.9)	61.0
Gender						
Male	35.1 (7.5)	37.0	37.6 (9.5)	40.5	72.7 (14.5)	65.5
Female	31.7 (8.7)	33.0	33.9 (10.8)	34.5	65.6 (17.5)	77.0
Self reported economic status						
Good	36.7 (8.7)	41.0	41.9 (7.4)	43.5	78.6 (15.2)	84.5
Moderate	32.8 (7.9)	34.0	34.7 (10.4)	36.0	67.5 (16.1)	71.0
Poor	31.0 (10.4)	28.0	32.3 (10.5)	30.0	63.3 (17.5)	59.0
Years of school education						
≤8	27.3 (7.1)	27.0	29.5 (9.3)	33.0	56.8 (13.7)	58.0
9–12	34.6 (6.4)	34.5	36.9 (8.2)	39.0	71.5 (12.1)	73.0
>12	40.7 (4.3)	42.0	43.6 (7.8)	45.0	84.3 (9.2)	86.0
Functional health literacy level						
Inadequate	24.4 (6.3)	25.0	23.4 (8.2)	24.0	47.8 (9.6)	50.0
Marginal	32.1 (5.3)	33.0	35.4 (5.3)	33.0	67.5 (4.9)	68.0
Adequate	40.1 (3.9)	40.0	44.1 (4.2)	45.0	84.2 (5.8)	83.0
Given printed materials						
I always read and complete them by myself	34.1 (7.9)	36.0	36.6 (10.1)	39.0	70.7 (16.2)	73.0
I ask for someone's help	27.2 (8.0)	26.0	28.8 (9.6)	33.0	56.0 (13.1)	53.0
Printed materials' understandability						
I always understand	35.3 (7.8)	37.0	38.5 (8.6)	42.0	73.8 (14.4)	76.0
I sometimes/never understand	25.4 (7.4)	25.0	32.2 (6.7)	32.5	57.6 (11.3)	58.0
Total	33.3 (8.3)	34.5	35.7 (10.3)	36.0	69.0 (16.5)	72.0

Table 4. Distribution of participants by reading comprehension and numeracy categories

Numeracy categories	Reading comprehension categories			Total N (%)
	Inadequate N (%)	Marginal N (%)	Adequate N (%)	
Inadequate	22 (44.9)	10 (23.3)	1 (1.7)	33 (22.0)
Marginal	18 (36.7)	14 (32.6)	11 (19.0)	43 (28.7)
Adequate	9 (18.4)	19 (44.2)	46 (79.3)	74 (49.3)
Total	49 (100.0)	43 (100.0)	58 (100.0)	150 (100.0)

economic condition, with >12 years of education and of male gender obtained the highest TOFHLA scores. After an adjustment for education level, an independent samples median test was applied and no statistical difference was found between the median TOFHLA scores in respect of age, gender and economic status. The difference in median TOFHLA scores among participants with distinct levels of education was statistically significant. Those with ≥12 years of education obtained a median score of 86.0, whereas the median score of participants with ≤8 years of education was 58.0.

The sample group in this study consisted of adults with low literacy (72.7% had ≤12 years of schooling). In order to evaluate the relationship between the reading and numeracy scores, the categorization method was used as described in a previous study of adults with low literacy (Golbeck, Paschal, Jones, & Hsiao, 2011). The reading comprehension scores were categorized as inadequate (0–29), marginal (30–37) and adequate (38–50) reading scores. The weighted numeracy scores were similarly categorized. The distribution of participants in respect of reading comprehension and numeracy categories is shown in Table 4.

As regards numeracy and reading comprehension skills, 30.7% (46/150) of participants had adequate, 14.7% (22/150) inadequate ms, and 9.3% (14/150) marginal competencies for both items. Of the total sample, 8.0% had higher reading comprehension than numeracy scores, while 18.6% scored higher in numeracy than in reading comprehension.

4. Discussion

The Turkish version of TOFHLA showed good internal reliability, and the correlations between the different reading comprehension passages and the numeracy test were statistically significant. Furthermore, TOFHLA in Turkish was culturally accepted and understandable.

A statistically significant relationship was determined between educational attainment and functional health literacy, with the functional health literacy level of this study group being marginal. A recent study conducted in Turkey using the HLS-EU-Q47 questionnaire, which was developed by the EU Consortium for the European Health Literacy Survey, revealed that the levels of health literacy in the Turkish population were as follows: 24.5% had inadequate health literacy, 40.1% marginal and 35.4% adequate (Durusu et al., 2014). This distribution is similar to the results of the current study. Another study, focusing on diabetic patients in Turkey, used the short version of TOFHLA and found that 49.0% of participants had inadequate, 14.0% marginal and 37.0% adequate health literacy (Eyüboğlu & Schulz, 2016). The percentage of participants with inadequate health literacy was higher and the percentage of those with marginal health literacy was lower in that study than in the current one. This discrepancy could be due to the use of the short version of TOFHLA, because the short version of this test is more suitable for screening patients in a medical clinic or determining the literacy level for health variables in education programmes. Furthermore the short version of TOFHLA includes literacy level as a descriptive variable rather than a dependent or independent research variable (Nurss et al., 2001). Other explanations for the high level of inadequate health literacy could be as follows:

The mean age (mean \pm SD) of the patients was higher than in our study group (51.6 ± 14.24 vs. 43.88 ± 13.5), and inadequate health literacy is frequent among older people.

Also, diabetic patients can develop dementia, brain health problems and depression as complications of diabetes, and these consequences may have diminished functional health literacy.

In Turkey, prior to 2010, the paperwork in hospital admissions (both outpatient and inpatient) was not as much as it is today, because the financing of the healthcare system was based on the Beveridge Model (in this system, healthcare is provided and financed by the government through tax payments, many hospitals and clinics are owned by the government and most doctors are government employees), and the relationship between patients and healthcare providers was dependent on personal communication and mutual trust. In 2010, financing of the healthcare system was changed to the Bismarck Model (this model uses an insurance system, usually financed jointly by employers and employees through payroll deduction, with doctors and hospitals tending to be private and tight regulation giving government much cost-control) and the compulsory general health insurance system was accepted. Furthermore, globalization of healthcare services, growing competition between different healthcare providers, and intensified interest in international accreditation of healthcare institutions increased the use of printed texts. Patients are faced with the trouble of reading and completing various forms involving health insurance, admission, discharge, informed consent and many other topics. Now the question is whether patients really understand all these forms and do they complete them correctly. The results of this study indicate that they do not. Most participants with inadequate and marginal health literacy (81.6%) reported that they always read and complete the printed materials on their own, although 47.1% referred not understanding them. In this study, the reading comprehension scores were lower than the numeracy scores, and this fact may suggest a low rate of comprehensibility of the printed materials. Turkish people do not read regularly. According to the Turkey Reading Culture Map Project results, Turkish people read an average of 7.2 books per year, most of the readers are students and 43.5% do not use libraries (Turkey Ministry of Culture & Tourism, 2012). Turkey is among the lowest ranking countries in terms of PISA (Program for International Student Assessment) reading performance scores (OECD, 2012). Therefore, the lower scores in reading comprehension are not a surprise. Both the mean scores of TOFHLA and the categorical distribution of functional health literacy are similar to the results of previous studies performed among adults with low literacy levels (Golbeck et al., 2011; Toçi et al., 2014). The functional health literacy level in the current study group was lower than that of previous studies from developed Western countries (Connor, Mantwill, & Schulz, 2013; Gazmararian, Williams, Peel, & Baker, 2003; Heijmans et al., 2015; Jovic-Vranes, Bjegovic-Mikanovic, Marinkovic, & Vukovic, 2013; Paasche-Orlow, Parker, Gazmararian, Nielsen-Bohlman, & Rudd, 2005; Wagner et al., 2007; Wong et al., 2014). Some studies have found significant associations between health literacy and certain socio-demographic characteristics such as gender, age, income and education (Connor et al., 2013; Gazmararian et al., 2003; Heijmans et al., 2015; Jovic-Vranes et al., 2013; Toçi et al., 2014; Wagner et al., 2007). The current study revealed only one socio-demographic factor which was associated with the level of functional health literacy and this factor was the years of education. Similar results have been found in other studies (Haerian, Hossein, Moghaddam, & Ehrampoush, 2015; Paasche-Orlow et al., 2005).

Nutbeam (2008) emphasized the importance of more general strategies to promote literacy, numeracy and language skills in populations to improve health literacy and to achieve the goal of independence in healthcare decision-making. The results of the current study support the views of Nutbeam (2008) and indicate an urgent need for policy changes and improvements concerning future educational programs.

The meaning of this study in real life is as follows: Patients are prone to have difficulty reading, understanding and interpreting most health materials; they are not going to be able to read and understand directions for healthcare; they may take their medications incorrectly or fail to follow prescribed diets or treatment orders. As a short term solution, changes in healthcare settings

according to the needs of these patients could be helpful. However, for a permanent solution the level of general education should be improved. More importance should be given to the education of girls. In Turkey, primary school education is compulsory for every Turkish citizen and is free of charge in public schools. The enrollment ratio in primary school education is similar for boys and girls, but after completing compulsory education more girls tend to dropout leave their education. This gender gap in educational attainment is more frequent in the Eastern part of the country and in rural areas. Ongoing gender discrimination within both families and a male-dominated community do not give equal opportunities to girls in many vital areas besides education. Families' decision on the continuation of girls' education after primary school is important and frequently this decision is that of dropping out of school. Many factors influence this decision: lack of schools in the neighborhood, poverty, preference for the use of limited family resources for the education of boys, the privileging of religious education over formal education for girls, and forcing girls into marriage at a young age are only some of these factors.

Despite increasing awareness of the importance of educating girls, as demonstrated by campaigns arranged by governments and non-governmental organizations, the gender gap in secondary and higher education still exists. Traditional beliefs and attitudes that want to see women reduced to domesticity, only as mothers or caregivers, inadequate infrastructure (lack of schools, insufficient number of teachers, etc.) and weak political will continue to act as barriers to girls' education. Turkey can solve this problem only with strong political commitment towards the elimination of gender discrimination.

5. Conclusions

We suggest that in a population with a low literacy level, any efforts to improve health literacy are temporary and useless.

Awareness and assessment of health literacy should be a part of healthcare services and incorporated into the training programs of healthcare professionals.

More research needs to be conducted to determine how to easily detect and improve health literacy, especially in populations with low literacy levels.

With an improved understanding of the vital role of health literacy in preventing and promoting health, practitioners would be better equipped to recognize and address the needs of patients with low health literacy. As is the case in Turkey, in most Eastern countries women are the most disadvantaged group at risk of low literacy and special emphasis should be given to them.

Visual materials such as cartoons, pictures, and videos can increase comprehension and should be considered as a temporary solution to improve health literacy, especially in disadvantaged groups.

6. Study limitations

Limitations of the study can be considered to be the cross-sectional nature of the study and the small sample size, with the sample being restricted to patients attending a single outpatient clinic. The results are restricted to this study group and cannot be generalized. However, this is one of the very few studies concerning the health literacy of Turkish patients which was conducted using the long version of TOFHLA. The numeracy skills and reading comprehension abilities of the participants were assessed through passages and questions that could arise in real life. The high internal reliability of the numeracy and reading sections, the significant correlations among these sections and the understandability of the Turkish-TOFHLA revealed no discrepancies in cultural context between the original and Turkish versions, demonstrating the suitability of this instrument for future health literacy studies in Turkey. In terms of the above-mentioned points, this study can be considered to be of value despite its limitations.

Supplementary material

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Authors Nazan Bilgel, Pinar Sarkut, Halil Bilgel, and Alis Ozcakir have made substantial contributions to the conception and design. Authors Pinar Sarkut and Halil Bilgel have made substantial contributions to acquisition and interpretation of data. Author Nazan Bilgel have been involved in data analyses and drafting the manuscript. All authors have been involved in revising it critically for important intellectual content and have given final approval of the version to be published.

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