MEDICAL SCIENCES / DAHİLİ TIP BİLİMLERİ

The Adaptation Study of the Test of Functional Health Literacy in Patients with Cardiovascular Diseases

Yetişkinlerde İşlevsel Sağlık Okuryazarlığı Testinin Kardiyovasküler Hastalarda Uyarlama Çalışması

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Abstract

Objectives: The aim of the study was to make the adaptation of the Functional Health Literacy in Turkish Adults (TOFHLA) in patients with cardiovascular disease.

Materials and Methods: Data collection form consisted of questions on socio-demographic-health related characteristics (31 items), verbal (30 items) and numeral (15 items) parts of TOFHLA. Computation was made out of 50. Data collection form was applied to the cardiology outpatient clinic applicants with face to face interview technique by the researcher (EU).

Results: The mean verbal and numerical competency scores were 41.67 and 43.33, respectively. The correlation coefficient between the verbal and numerical competency scores was r=0.48 (p<0.001). No linear relation was found between age and scores. Spearman's Rho values are as follows; age and verbal score r=0.02, p>0.05, age and numeral score r=-0.02, p>0.05, age and total score r=-0.01, p>0.05. Statistically significant differences were found between verbal, numeral and total scores of the education groups. It was found that the scores increased in parallel with the increased educational degree. Nuclear families had the highest scores.

Conclusion: In terms of public health, to design and implement studies on a national scale in a broad context and to study the factors affecting the health literacy levels of different segments of society seem important.

Key Words: Health Literacy, Test of Functional Health Literacy in Adults, Adaptation Study of Test of Functional Health Literacy in Turkey

Öz

Amaç: Çalışmanın amacı Türk Yetişkinlerde İşlevsel Sağlık Okuryazarlığının (TOFHLA) kardiyovasküler hastalarda adaptasyonunu sağlamaktır.

Gereç ve Yöntem: Veri toplama formu TOFHLA'nın sosyo-demografik sağlıkla ilgili özelliklerini (31 soru), sözel (30 soru) ve sayısal (15 soru) bölümlerini içermektedir. Hesaplama 50 puan üzerinden yapılmıştır. Araştırmacı (EU) tarafından yüz yüze görüşme tekniği ile kardiyoloji polikliniğine başvuran bireylere veri toplama formu uygulanmıştır.

Bulgular: Ortalama sözel ve sayısal yeterlilik puanları sırasıyla 41,67 ve 43,33'tü. Sözel ve sayısal yeterlik puanları arasındaki korelasyon anlamlı olarak bulundu (r=0,48, p<0,001). Yaş ve skorlar arasında doğrusal bir ilişki bulunamadı. Spearman'ın Rho değerleri yaş ve sözel puan için r=0,02, p>0,05, yaş ve sayısal puan için r=-0,02, p>0,05, yaş ve toplam puan için r=-0,01, p>0,05 olarak bulundu. Eğitim gruplarının sözel, sayısal ve toplam puanları arasında istatistiksel olarak anlamlı farklılık bulunmuştur. Eğitim derecesinin artmasıyla skorların arttığı belirlenmiştir. Çekirdek aileler en yüksek puanları aldı.

Sonuç: Halk sağlığı açısından, geniş bir bağlamda ulusal ölçekte çalışmalar tasarlamak ve uygulamak ve toplumun farklı kesimlerinin sağlık okuryazarlığı düzeylerini etkileyen faktörleri incelemek önemli görünmektedir.

Anahtar Kelimeler: Sağlık Okuryazarlığı, Yetişkinlerde İşlevsel Sağlık Okuryazarlığı Testi, Türkiye'de İşlevsel Sağlık Okuryazarlığı Testinin Uyarlama Çalışması

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Introduction

Health literacy can be defined as the use of basic health knowledge to guide individuals' own health and community health decisions and behavior (1). The issue of health literacy has become an important public health concept today, with an increasing prevalence of chronic diseases and also increased follow-up time. Today, it has become a priority issue that health information has increased in an aggregate, the sources of information are diversified, and the quality of accessible information cannot be evaluated sufficiently. In addition, patients are expected to play new roles in understanding rights and responsibilities and making health-related decisions for themselves and others (2). Given the impact of health literacy on health status, health expenditure, access to healthcare, the understanding of health information, and health-related decision-making skills, it would be appropriate to assess the health literacy levels of patients (served groups) (3).

Health literacy depends on the cultural infrastructure of the individual (4). Therefore, measurement of health literacy in different cultures and adaptation of measurement tools to the local language seems to be important. There are limited number of studies using different scales in this area in Turkey. Rapid estimate of adult literacy in medicine (REALM), newest vital sign (NVS), and short version of the test of functional health literacy in adults (S-TOFHLA) scales have been used to determine the health literacy in Turkey (5-7). In these studies, the most important determinant of health literacy was determined as the level of education. Adequate health literacy rate has been reported at the rate of 26.2%-58.7%. In the study of Bilgel et al. (8) using the TOFHLA scale in adults, education level was determined as the most important determinant of health literacy. They reported that women and the elderly were the most disadvantaged group due to their level of education. In our country, more studies on determining health literacy are needed and in the light of these studies, and also necessary educational activities should be done.

Our primary goal was to carry out the validation and adaptation study in the Turkish language of the TOFHLA scale. The secondary aim was to identify the health literacy status of individuals who applied to the cardiology outpatient clinic, and to examine the socio-demographic characteristics affecting their literacy levels.

Materials and Methods

The population of the study was made up of individuals who applied to the Gülhane Hospital cardiology clinic between December 2012 and February 2013. Institutional approval and ethics committee approval were obtained for the study (2012,

Ref. no: 187). In addition, informed voluntary consent form was obtained from the patients. General health status is stable, between 19-65 years old, at least primary school graduates, verbally agreed to participate in the study, individuals who can communicate in Turkish were included in the study. Individuals who are illiterate, have insufficient capacity to see survey questions, and have a cognitive impairment level that prevent them from understanding the questionnaire questions or providing clear and explicit answers are excluded from the study. The data collection form was applied to the individuals who applied to the cardiology clinic by the researcher through face-to-face interview technique. The Questionnaire was applied to 450 individuals, but 351 forms were taken into consideration due missing and inconsistent answers.

The data collection form of the research; socio-demographic data collection form consisted of TOFHLA verbal and numerical questions.

TOFHLA

The test consists of two parts: Comprehension (verbal) and numerical part. Numerical part: It is a 17-item test created using real hospital forms and medicine bottle labels. The weighted score of the correct answer for each question is calculated and the total score obtained from the numerical section is reached. The test takes approximately 22 minutes to complete. The sum of reading comprehension and the weighted score of the numerical section gives a value between zero and 100, and these sections have equal participation in the result (Reading comprehension is evaluated between 0-50 points and the numerical section is evaluated between 0-50 points). According to the TOFHLA scoring, the literacy level of those who answered the questionnaire is divided into three categories: 1) Insufficient health literacy (0-59 points); 2) Low level/Limited health literacy (60-74 points); 3) Adequate health literacy (75-100 points). According to the scoring results, most of the people with adequate health literacy are considered to have the ability to read, understand and interpret the health text, while those with low or inadequate health literacy were assessed to have difficulties in reading, understanding and interpreting most health text (3,5,9-11).

The Following Steps Were Performed in Order For The Test to be Adapted to Turkish

- Translation of TOFHLA to Turkish, language validity and preliminary trial of volunteers was done by the Research-Based Pharmaceutical Companies Association (AIFD). They allowed the form to be used for academic studies on January 7, 2012 in digital environment.

- The test was applied to 10 volunteers in our center for the adaptation of the test translated by AIFD into Turkish (February 2012).

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- The correction and changes were made on the scale translated into Turkish by taking the evaluation of 10 faculty members from the field of public health, assessment and evaluation and linguistics, who are experts in the subject (October 2012 - November 2012).

- The pretest evaluation was made on 10 volunteers in our center (November 2012).

- Data were collected from individuals who applied to the cardiology outpatient clinic and met the criteria for participation in the study (December 2012- February 2013).

Removal of the questions those were not compatible to the demographic and social security system conditions in Turkey has decreased the number of questions. However, the lowest and highest scores that can be obtained from the test were kept the same so that the evaluation criteria did not change. While the lowest score that can be obtained from 30 questions in reading comprehension section is zero, the highest score is 50 and all questions give the same score. (Suplementary Data: Translated and Validated Form of TOFHLA in Turkish Language).

Statistical Analysis

The Cronbach Alpha coefficient of the test was determined as 0.98 by Parker et al. (9). Statistical Package for Social Sciences (SPSS) 22.0 software program was used to examine the relationships between variables. Number, percentage, average and standard deviation (SD) were used in summarizing the data. Scores of the tests' (verbal competency, numeracy competency and total scores) did not match to normal distribution, skewed to left so we used transformed scores for independent sample t-test, One-Way ANOVA and regression analysis. For the transformation, scores were removed from the 1 point over of the maximum score that can be taken, after that logarithmic transformation applied. In the case that even the transformation did not fit, non-parametric statistical tests were used. In addition, in order to identify the most important determinants of health literacy, multiple linear regression analysis was performed after the univariate analysis, in which variables that made significant difference in verbal and numerical scores were included. To meet the assumptions of the regression analysis, transformed points were used as the dependent variable. Since independent variables other than the number of people in the household are in the classification and ranking scale, dummy variables are defined. Our aim was to determine which variables predicted verbal, numerical and total scores. In regression analysis, stepwise method was used.

Results

Of the study participants 30.7% were between the ages of 19-29, 68.1% were males. The group's 39.9% were

of university graduates, 60.7% were married, 35.6% were officer-office workers, 53.0% reported their economic status as moderate. The group's 63.2% evaluated own reading comprehension level as good, 86.6% stated computer proficiency. Of the study group 27.9% were current smokers and almost half of them (43.3%) reported that they never smoked. The Group's history of hospitalization average was 2.21±1.24; mean contact number with a health care provider within one-month period due to health problems of himself or relatives was 1.87±1.22.

Median verbal and numeracy competency scores ± SD were 41.67±8.43 and 43.33±8.31 in order. Internal consistency (Cronbach-α) values measured 0.86 and 0.73 with the same order (Table 1). The correlation between the verbal competency and numeracy competency scores was r=0.48 (p<0.001).

Median difficulty index of verbal (0.87) and of numeral (0.87) competency sub test's items reflected too easy articles (Table 2). Median discrimination power index of the verbal (0.46) and numeral (0.47) competency sub test's items reflected pretty good substances (Table 2).

A statistically significant relationship was found between the socio-demographic characteristics of the study group, gender (verbal), education level, family type and alcohol use, and health literacy (Table 3). Increasing the educational degree, increasing the scores. Nuclear families had the highest scores, statistically significant differences were found between verbal, numeral and

Table 1: Descriptive Statistics of verbal and numeral competency scores and internal consistency

Statistics	Scores		
	Verbal competency	Numeral competency	Total
Mean	38.75	41.79	80.54
Median	41.67	43.33	85.00
Mode	43.33	50.00	88.33
Standard deviation	8.43	8.30	14.63
Minimum	6.67	0.00	11.67
Maximum	50.00	50.00	100.00
Cronbach alpha	0.86	0.73	0.88

The correlation between the verbal competency and numeracy competency scores was r=0.48 (p<0.001). Internal consistency was good

Table 2: Difficulty index and discrimination power index of the verbal and numeral competency sub test's items

Statistics	Verbal competency		Numeral competency	
	Difficulty index (p)	Discrimination power index (r)	Difficulty index (p)	Discrimination power index (r)
Mean	0.78	0.47	0.83	0.47
Median	0.87	0.46	0.84	0.47
Minimum	0.31	0.26	0.68	0.31
Maximum	0.95	0.65	0.95	0.63

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total scores of family types. There was no relationship between the marial status and health literacy (Table 3).

Of the patients participated to the study, 67.8% were working actively. And 53% of the working group identified themselves as middle income earners. It was observed that both study and economic level were significantly associated with health literacy (p=0.046).

No linear relation found between age and scores. Spearman's Rho values are as follows; age and verbal score r=0.02, p>0.05, age and numeral score r=-0.02, p>0.05 and, age and total score r=-0.01, p>0.05.

Weak but statistically significant differences were found between verbal, numeral and total scores of household groups. Increasing the number of people living in the household, decreasing the scores. Spearman's Rho values are as follows; household group and verbal score r=-0.26, p<0.001, household group and numeral score r=-0.19, p<0.001, household group and total r=-0.27, p<0.001.

No statistically significant differences were found between verbal, numeral and total scores of the smoking groups.

Multivariate regression analysis results regarding determination of verbal skills, numerical skills and predicting

Table 3: Socio-demographic characteristics that have a significant relationship with health literacy							
		Verbal score		Numeral score		Total score	
	n	Mean	S	Mean	S	Mean	S
Gender							
Female	112	40.22	7.41	41.76	7.47	81.98	12.97
Male	239	38.06	8.79	41.80	8.67	79.86	15.33
Total	351	38.75	8.43	41.79	8.30	80.54	14.63
		t=-2.26, p=0.025		t=0.40, p=0.690		t=-1.03, p=0.304	
Education							
Primary school	26	29.55	7.54	28.97	10.60	58.53	15.59
Secondary school	42	31.63	9.34	38.33	8.99	69.96	15.82
High school	120	37.13	8.09	41.58	7.31	78.71	12.73
University	140	42.83	5.18	44.45	5.84	87.29	8.88
Post graduate studies	23	45.80	3.25	47.39	4.02	93.19	5.20
Total	351	38.75	8.43	41.79	8.30	80.54	14.63
		χ^2=124.4, p=0.00		χ^2=77.00, p=0.000		χ^2=124.6, p=0.000	
Marital status							
Married	213	39.22	7.89	41.88	8.36	81.10	14.21
Single	127	38.02	9.16	41.71	8.10	79.72	14.96
Divorced	7	44.05	3.17	46.67	3.85	90.71	5.84
Widow	4	27.92	8.96	30.83	9.57	58.75	17.61
Total	351	38.75	8.43	41.79	8.30	80.54	14.63
		t=-0.91, p=0.366		t=-0.22, p=0.828		t=-0.77, p=0.445	
Family type*							
Nuclear	278	39.94	7.54	42.75	7.18	82.69	12.65
Extended	55	33.67	9.33	38.30	11.00	71.97	17.09
Single parents	18	35.93	11.99	37.59	11.01	73.52	22.49
Total	351	38.75	8.43	41.79	8.30	80.54	14.63
		χ^2=24.93, p=0.00		χ^2=11.47, p=0.003		χ^2=24.15, p=0.000	
Alcoholic							
Drinks	26	39.74	8.62	40.28	10.28	80.00	17.65
On special days	139	40.59	6.96	43.81	6.48	84.40	10.79
Does not drink	186	37.24	9.13	40.48	8.92	77.72	16.02
Total	351	38.75	8.43	41.79	8.30	80.54	14.63
		F=5.78, p=0.003		F=5.56, p=0.004		F=6.45, p=0.002	

t: t-test, χ^2: Kruskal-Wallis test

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variables of total points are presented in Table 4. Occupation, education level and the number of individuals in the household have emerged as the most important parameters determining health literacy.

Discussion

We observed good verbal and numeral competency scores and internal consistency in the Turkish version of TOFHLA. Correlations between the different reading comprehension passages and the numeracy test were statistically significant. In addition, difficulty index and discrimination power index of the verbal and numeral competency sub test's items measurements were accebtable. It may conclude that TOFHLA in Turkish was culturally accepted and understandable.

Factors that positively affect health literacy are high level of education, low household size, being an employer, self-employed, actively working in a job, having a good economic level, having health security, living in the city center, reading comprehension level. It can be summarized as being good, knowing how to use computers, having easy access to news sources, using regular medicines, and understanding the information written in the drug package. The average age of patients in our study group, education level, the rate of having health insurance, economic level, the number of people living in households were similar with studies of HL carried out in Turkey (12-15). In our study, the ratio of women to men is in favor of men, unlike other studies. The rate of people of our study capable of using computer was higher than the average of Turkey. The reason for this can be explained by the selection of the cohort of our study from the military hospital.

In the study, no statistically significant relationship was found between the level of health literacy and gender (numerical TOFHLA) or marital status. This finding is similar to the health literacy measurements made by national and international measurement (15-19). However, in studies conducted with different scales (REALM, NVS) in Turkey, HL level was found to be better in men or women, probably, depending on the level of education of the selected cohort (5,13,20).

The relationship we found statistically significant between the level of education and HL is consistent with the literature. In many studies, a positive correlation has been reported between the number of completed school years and the level of HL (16-19,21). In the literature, the important effect of being a college graduate on the level of health literacy has been emphasized. In addition, it has been stated that education is at least as effective as ethnicity and age on health literacy and health outcomes (19). In the study of Berkman et al. (22) the factors that determine low health literacy are stated as advanced age, low income, low education level and ethnicity. There are publications in the literature showing that education level and consequently low health literacy are more common among older adults. Similar to the literature, the occupational groups associated with the level of education were found to be significantly higher among professional groups such as civil servant-office employees, health literacy, highly educated, or tradesmen in individuals with higher education (23). In our country, the relationship between education level and health literacy is shown with other scales (5,13,15). In addition, a statistically significant relationship was found between reading comprehension and health literacy level in our study and seems to be compatible with the literature (20).

In our study, the positive relationship between the economic situation and the health literacy level seems to be compatible with the literature. Baker et al. (17,18) reported a statistically significant relationship between individuals' health literacy level and annual income status. In addition, Ozdemir et al. (5) reported that the weak/bad economic situation is associated with low health literacy. In our study, it was found that health insurance, which is associated with economic income, positively affects health literacy, and that the household presence, which is inversely related to per-household income, negatively affects health literacy.

Advantages, Limitations and Suggestions for Improvement

Although we present the results of patients of one single outpatient clinic, we included large number of participants to this cross-sectional study. This was one of the very early studies evaluating the health literacy of Turkish patients which was studied using the long version of TOFHLA. In additions we did not evaluate whether the communication style of health provider on the verbal or numeral scores especially in patients with limited literacy skills. Also, some factors can influence patients' satisfaction and their willingness to undergo literacy assessment. These factors may influence the reults. However, these disadvantages can be discarded because of correlations

Table 4: Predictors of verbal, numeral competency scores

Score	Variables of the model	R square	F	p
Verbal	Education, number of people living in the household	0.35	46.23	0.000
Numeral	Job, education, number of people living in the household	0.25	18.75	0.000
Total	Job, education, number of people living in the household	0.35	31.33	0.000

We obtained a statistically significant model in all three. We can interpret R squares as follows, 35% of the change in verbal score can be explained by the level of education and the number of people living in the household

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between the different reading comprehension passages and the numeracy test were statistically significant. Besides, we performed univariate and multivariate analyses of many different parameters to achieve a better understanding the value of the different demograpgic parameters to predict health literacy level of patients.

Conclusion

From the point of view of public health to design and implement studies on a national scale in a broad context and to study the factors affecting the health literacy levels of different segments of society seems important. The validated TOFHLA will allow conducting studies in Turkey in medical care. The TOFHLA seems to capable of accurately assessing the level of health literacy among Turkish population and by the way give opportunity to develop strategies to improve enhance health status and achieve a high quality of life.

Ethics

Ethics Committee Approval: Ethics committee approval was obtained from the Gülhane Military Medical Academy Ethics Committee at the session number 187 on 06.03.2012.

Informed Consent: All patients were informed about the study and content of the survey; written and verbal patient consent was taken.

Peer-reviewed: Externally peer-reviewed.

Authorship Contributions

Concept: E.Ü., B.P., Design: E.Ü., B.P., Data Collection or Processing: E.Ü., B.P., Analysis or Interpretation: E.Ü., B.P., Ü.Ç., Literature Search: E.Ü., B.P., Writing: E.Ü., B.P.

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References

1. Liu C, Wang D, Liu C, et al. What is the meaning of health literacy? A systematic review and qualitative synthesis. Fam Med Community Health. 2020;8:e000351.

2. Institute of Medicine (US) Committee on Health Literacy. Health Literacy: A Prescription to End Confusion. Nielsen-Bohlman L, Panzer AM, Kindig DA, editors. Washington (DC): National Academies Press (US); 2004.

3. Commentary on Mancuso JM. Assessment and measurement of health literacy: an integrative review of the literature. Nursing & Health Sciences 2009; 11: 77-89. Nurs Health Sci. 2010;12:145-146.

4. Levin-Zamir D, Leung AYM, Dodson S, et al. Health Literacy in Selected Populations: Individuals, Families, and Communities from the International and Cultural Perspective. Stud Health Technol Inform. 2017;240:392-414.

5. Ozdemir H, Alper Z, Uncu Y, et al. Health literacy among adults: a study from Turkey. Health Educ Res. 2010;25:464-477.

6. Eyüboğlu E, Schulz PJ. Validation of Turkish health literacy measures. Health Promot Int. 2016;31:355-362.

7. Yılmazel G, Çetinkaya F. The importance of health literacy for community health. TAF Preventive Medicine Bulletin. 2016;15:69-74.

8. Bilgel N, Sarkut P, Bilgel H, et al. Functional health literacy in a group of Turkish patients: A pilot study. Cogent Soc. Sci. 2017;3:1287832.

9. Parker RM, Baker DW, Williams MV, et al. The test of functional health literacy in adults: a new instrument for measuring patients' literacy skills. J Gen Intern Med. 1995;10:537-541.

10. Pawlak R. Economic considerations of health literacy. Nurs Econ. 2005;23:173-147.

11. Betz CL, Ruccione K, Meeske K, et al. Health literacy: a pediatric nursing concern. Pediatr Nurs. 2008;34:231-239.

12. Kuru NY. Gülhane Askeri Tıp Akademisi Ankara Eğitim ve Araştırma Hastanesine Başvuran Koroner Arter Hastalığı Tanılı Bireylerin Sağlık Davranışlarının Belirlenmesi. Ankara Üniversitesi Tıp Fakültesi Halk Sağlığı Anabilim Dalı Halk Sağlığı Hemşireliği Yüksek Lisans Tezi, Ankara. 2010.

13. Campbell P, Lewis M, Chen Y, et al. Can patients with low health literacy be identified from routine primary care health records? A cross-sectional and prospective analysis. BMC Fam Pract. 2019;20:101.

14. Zhang D, Sit RWS, Wong C, et al. Cohort profile: The prospective study on Chinese elderly with multimorbidity in primary care in Hong Kong. BMJ Open. 2020;10:e02729.

15. Geboers B, Uiters E, Reijneveld SA, et al. Health literacy among older adults is associated with their 10-years' cognitive functioning and decline - the Doetinchem Cohort Study. BMC Geriatr. 2018;18:77.

16. Gausman Benson J, Forman WB. Comprehension of written health care information in an affluent geriatric retirement community: use of the Test of Functional Health Literacy. Gerontology. 2002;48:93-97.

17. Baker DW, Wolf MS, Feinglass J, et al. Health literacy and mortality among elderly persons. Arch Intern Med. 2007;167:1503-1509.

18. Baker DW, Gazmararian JA, Williams MV, et al. Health literacy and use of outpatient physician services by Medicare managed care enrollees. J Gen Intern Med. 2004;19:215-220.

19. Paasche-Orlow MK, Parker RM, Gazmararian JA, et al. The prevalence of limited health literacy. J Gen Intern Med. 2005;20:175-184.

20. Uğurlu, Z. Sağlık Kurumlarına Başvuran Hastaların Sağlık Okuryazarlığının ve Kullanılan Eğitim Materyallerinin Sağlık Okuryazarlığına Uygunluğunun Değerlendirilmesi. Başkent Üniversitesi Sağlık Bilimler Enstitüsü Halk Sağlığı Anabilim Dalı Doktora Tezi, Ankara. 2011.

21. Baker DW, Gazmararian JA, Williams MV, et al. Functional health literacy and the risk of hospital admission among Medicare managed care enrollees. Am J Public Health. 2002;92:1278-1283.

22. Berkman ND, Sheridan SL, Donahue KE, et al. Low health literacy and health outcomes: an updated systematic review. Ann Intern Med. 2011;155:97-107.

23. Gazmararian JA, Baker DW, Williams MV, et al. Health literacy among Medicare enrollees in a managed care organization. JAMA. 1999;281:545-551.