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EVALUATION OF HEALTH LITERACY LEVEL AND RELATED FACTORS IN OLDER ADULT PATIENTS

ABSTRACT

Introduction: Health literacy refers to the degree to which individuals have the capacity to obtain, process and understand basic health information and services. This study, aimed to determine the level of health literacy and the factors related health literacy in patients aged 65 years and over who applied to the outpatient clinic.

Materials and Methods: This single-center, descriptive study was conducted between December 1, 2020, and April 31, 2021. A total of 98 patients aged 65 years and over who applied to the physical therapy and rehabilitation outpatient clinic due to musculoskeletal problems were included in the study. We assessed the patients' age, sex, education level, monthly income, marital status, and frequency of hospital admission in the last 3 months, determined patients health literacy levels, and examined the relationship between them. The Turkish Health Literacy Scale was used to evaluate patients health literacy.

Results: The mean The Turkish Health Literacy Scale index score of the participants in the study was 27.92±7.53. The increase in health literacy level was statistically significant among the young aged, with high monthly income, and high education level (p<0.001). There was no statistically significant relationship between gender, marital status, frequency of admission to hospital in the last 3 months and health literacy (p>0.05).

Conclusion: We determined that the level of health literacy was low in older adult patients. Informing these patients regarding this issue and improving their health literacy levels is important to ensure a more efficient use of health services.

Key words: Health Literacy; Health Education; Aged.

INTRODUCTION

Health literacy refers to the degree to which individuals can obtain, process, and understand basic health information and services (1). Health literacy is a concept that concerns everyone involved in health promotion, disease prevention, screening, health care, and health policy-making. Health literacy skills are needed to discuss health, read health information, interpret health outcomes and charts, and use medical tools in personal or family health care (2). Low health literacy poses a risk of poor health outcomes, and can act as a barrier to effective disease management; this is more common, particularly in chronic diseases (3).

Health literacy in older adults is considered important in preventing disability and the need for long-term care (4). Cognitive function may decline with age. Moreover, problems in cognitive function are associated with low health literacy, regardless of socioeconomic and health status criteria (5). Thus, low levels of health literacy associated with aging may prevent older adult patients from benefitting through the health system.

In a study investigating the relationship between mortality rate in older indivuals and health literacy and cognitive abilities, it was concluded that both low health literacy level and low cognitive skills independently increase mortality (6). Cho et al. demonstrated that health literacy directly affects the utilization of health services among older individuals (7). In a study investigating the relationship between health literacy and functional health status in older individuals, poor health literacy among older adults was independently associated with adverse physical and mental health (8). In a cohort study, lower health literacy was found to increase the risk of rapid physical decline among older adults (9).

In this study, we aimed to determine the level of health literacy and to determine the factors related health literacy in patients aged 65 years and over who applied to physical medicine and rehabilitation outpatient clinic due to musculoskeletal problems.

MATERIALS AND METHODS

This was a single-center, descriptive study conducted between December 1, 2020, and April 31, 2021. A total of 98 patients (61 women and 37 men) who applied to the physical therapy and rehabilitation outpatient clinic due to musculoskeletal problems were included in the study. During the specified period, 130 older adult patients applied to the outpatient clinic, 28 of them did not meet the inclusion criteria, 4 patients did not want to participate in the study even though they met the criteria. None of the remaining 98 patients were excluded from the study.

Patients aged <65 years, with aphasia, illiteracy, and inability to complete the questionnaires due to impaired cognitive status were not included in the study. Patients were asked about their age, sex, education level, monthly income, marital status, and frequency of hospital admission in the last 3 months. The Turkish Health Literacy Scale (TSOY-32) was used to evaluate patients' health literacy. Data were collected by the co-researcher by explaining each question to the patients. Questionnaire forms were filled when it was sure that the patients understood the questions.

The TSOY-32 scale developed by Okyay et al., the validity and reliability of a proven, European Health Literacy (HLS-E) study is a scale with 32 items developed on the basis of the conceptual framework. The scale was standardized with the help of formula. Formula= (arithmetic mean-1) x [50/3]. A minimum index score of 0 points indicates the lowest health literacy, and 50 indicates the highest health literacy: (0-25) points indicate; insufficient health literacy, (>25-33) ; problematic – limited health literacy, (>33-42) ; adequate health literacy, and (>42-50); excellent health literacy (10). The Cronbach's alpha coefficient of the TSOY-32 scale is 0.92. In our study, the Cronbach's alpha value was found to be 0.87. The reliability coefficient of TSOY-32 in this study is similar to the coefficient in the validity and reliability study of the scale.

This study was approved by the Clinical Research Ethics Committee of Bursa Uludag University approval number 2020-21/14 and written informed consent was obtained from all participating patients.

Statistical analysis

Shapiro Wilk test was used for assessing whether the variables follow normal distribution or not. Continuous variables were presented as median (25–75. percentile) and mean±standard deviation(minimum-maximum) values. Categorical variables were reported as n(%). Pearson chi-square, Fisher's exact chi-square test or Fisher-Freeman-Halton Exact test were used for comparing categorical variables. Correlations between continuous variables were examined by correlation analysis and Spearman correlation coefficients were calculated. Multiple linear regression analysis was performed to determine the factors related TSOY-32 index score. Variables are included in multiple linear regression model by using Enter method. The variables found to be significant in the model were determined as independent variables. Multiple linear regression model was found to be significant (p <0.001). SPSS (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0, Armonk, NY: IBM Corp.) was used for statistical analysis and p value <0.05 was considered statistically significant.

RESULTS

A total of 98 patients were included in this study. The mean age was 69.48±3.80 years; the majority of the patients were female (62.24%) and had less than high school education (88.78%). The mean TSOY-32 index score of the participants was 27.92±7.53 (problematic-limited level). The participants' socio-demographic characteristics and their categorical distrubution according to the TSOY-32 index scores are given in Table 1 and Table 2, respectively.

There is a significant inverse relationship be-

Table 1. Distribution of study participants by socio-demographic characteristics

	(n=98)
Age	69(66-71) 69.48±3.80(65-80)
65-74	85(86.73%)
75-84	13(13.27%)
Sex	
Women	61(62.24%)
Men	37(37.76%)
Education status	
High school and higher	11(11.22%)
Secondary school	38(38.78%)
Primary school	49(50.00%)
Marital status	
Married	52(53.06%)
Divorced	34(34.69%)
Single	12(12.25%)
Monthly income	
Less than 2000 TL	21(21.43%)
2000-4000 TL	59(60.20%)
Over 4000 TL	18(18.37%)
Frequency of admission to hospital in the last 3 months	
1	45(45.92%)
2	27(27.55%)
3	13(13.27%)
4	7(7.14%)
5	5(5.10%)
6	1(1.02%)
Number of hospital admissions in the last 3 months	2(1-3) 2.01±1.23(1-6)
1-3	85(86.73%)
4-6	13(13.27%)

Data are expressed as n(%), median (25–75. percentile) and mean±standard deviation(minimum-maximum).

tween the TSOY-32 index score and the age of the patients (p<0.001, $r_{s=}$-0.637) (Table 3 and Table 4, respectively).

A statistically significant difference was found between education level and TSOY-32 index scores (p<0.001) (Table 3).

In the subgroup analyzes, a significant difference was found between the groups according to the proportion of patients with primary school education (p<0.001). The proportion of primary school graduate patients with inadequate TSOY-32 level was higher than those with TSOY-32 adequate and excellent levels (p=0.001 and p=0.001, respectively). The proportion of primary school graduate patients with TSOY-32 problematic – limited is higher than those with TSOY-32 who are adequate and excellent levels (p=0.001 and p<0.001, respectively).

In the subgroup analyzes, a difference was found between the groups according to the proportion of patients with secondary school education (p=0.008). The proportion of secondary school graduate patients with an inadequate TSOY-32 level was higher than those with an excellent TSOY-32 level (p=0.006). The proportion of secondary school graduate patients with TSOY-32 problematic – limited is higher than those with perfect TSOY-32 (p=0.003).

In the subgroup analyzes, a difference was found between the groups according to the proportion of patients with high school or higher education (p=0.008). The proportion of high school graduates and higher graduates with adequate TSOY-32 level is higher than those with TSOY-32 inadequate and problematic – limited levels (p=0.032 and p=0.007, respectively).

A statistically significant difference was found between monthly income and TSOY-32 index scores (p<0.001) (Table 3).

In the subgroup analyzes, a difference was found between the groups according to the proportion of patients whose monthly income was less than 2000 TL (p<0.001). The proportion of patients with inadequate TSOY-32 and a monthly income below 2000 TL is higher than those with TSOY-32 with a problematic – limited, adequate and excellent level (p=0.024, p<0.001 and p=0.037, respectively).

In the subgroup analyzes, a difference was found between the groups according to the proportion of patients with a monthly income of 2000-4000 TL (p=0.011). The proportion of patients with an inadequate TSOY-32 level and a monthly income between 2000-4000 TL is higher than those with a excellent TSOY-32 level (p=0.047). The proportion of patients with TSOY-32 problematic – limited level and monthly income between 2000-4000 TL is higher than those with TSOY-32 excellent level (p=0.002). The proportion of patients with TSOY-32 adequate level and monthly income between 2000-4000 TL is higher than those with TSOY-32 excellent level (p=0.039).

In the subgroup analyzes, a difference was found between the groups according to the proportion of patients with a monthly income of more than 4000 TL (p<0.001). The proportion of patients with a TSOY-32 adequate and excellent level and a monthly income of more than 4000 TL is higher than those with an inadequate TSOY-32 level (p<0.001 and p<0.001, respectively). The proportion of patients with TSOY-32 adequate and excellent level and monthly income over 4000 TL is higher than those with TSOY-32 problematic – limited level (p=0.005 and p<0.001, respectively).

In addition, no statistically significant relationship was found between sex, the frequency of hospital admission in the last 3 months and marital status and TSOY-32 index scores (p=0.074, p=0.067 and p=0.145, respectively) (Table 3).

Multiple linear regression analysis was performed to determine the factors related TSOY-32 scores. The independent variables were included in the regression model using the enter method. The established logistic regression model was found to be significant (p<0.001) (Table 5).

Table 2. Categorical distribution of TSOY-32 results in study participants

TSOY-32 result	(n=98)	
Insufficient health literacy (0-25)	38(%38.78)	17.45(14.50-21.40) 18.13±3.73(13-24.10)
Problematic – limited health literacy (>25-33)	30(%30.61)	28.05(26.20-31.90) 28.73±2.65(25.10-33)
Adequate health literacy (>33-42)	22(%22.45)	37.35(35.70-40.10) 37.55±2.75(33.20-42)
Excellent health literacy (>42-50)	8(%8.16)	43.75(43.15-47.80) 44.93±2.48(42.10-47.90)

Data are expressed as n(%), median (25–75. percentile) and mean±standard deviation(minimum-maximum).

Table 3. Relationship between health literacy level and socio-demographic characteristics

(n=98)	TSOY-32 Insufficient health literacy (n=38)	TSOY-32 Problematic – limited health literacy (n=30)	TSOY-32 Adequate health literacy (n=22)	TSOY-32 Excellent health literacy (n=8)	P[a]
Age					
65-74 (n=85)	27(31.76%)	28(32.94%)	22(25.88%)	8(9.41%)	**<0.001**
75-84 (n=13)	11(84.62%)	2(15.38%)	0	0	
Sex					
Women (n=61)	25(40.98%)	22(36.07%)	12(19.67%)	2(3.28%)	0.074
Men (n=37)	13(35.14%)	8(21.62%)	10(27.03%)	6(16.22%)	
Education status					
Primary school (n=49)	24(48.98%)	21(42.86%)	4(8.16%)	0	**<0.001**
Secondary school (n=38)	12(31.58%)	8(21.05%)	11(28.95%)	7(18.42%)	
High school and higher (n=11)	2(18.18%)	1(9.09%)	7(63.64%)	1(9.09%)	
Marital status					
Single (n=12)	3(25%)	3(25%)	4(33.33%)	2(16.67%)	0.145
Married (n=52)	17(32.69%)	16(30.77%)	15(28.85%)	4(7.69%)	
Divorced (n=34)	18(52.94%)	11(32.35%)	3(8.82%)	2(5.88%)	
Monthly income					
Less than 2000 TL (n=21)	16(76.19%)	5(23.81%)	0	0	**<0.001**
2000-4000 TL (n=59)	22(37.29%)	23(38.98%)	13(22.03%)	1(1.69%)	
Over 4000 TL (n=18)	0	2(11.11%)	9(50%)	7(38.89%)	
Number of hospital admissions in the last 3 months					
1-3 (n=85)	31(36.47%)	24(28.24%)	22(25.88%)	8(9.41%)	0.067
4-6 (n=13)	7(53.85%)	6(46.15%)	0	0	

Data are expressed as n(%). a: Fisher Freeman Halton test

Table 4. Correlation between TSOY-32 index scores and age

	TSOY-32 index score	
	r_s	p
Age	-0.637	**<0.001**

rs: Spearman correlation coefficient

DISCUSSION

In this study, we found the participants' mean TSOY-32 index score was 27.92±7.53 (problematic-limited level). In a study conducted among nursing students, Kaya et al. found the mean TSOY-32 index score to be 35.97±8.73 (11). In another study, the mean TSOY-32 index score of individuals aged 21-64 was 24.59±10.33 (12). In another study involving in-

Table 5. Factors related TSOY-32 index scores

	Unstd. B	Std. Error	t	p-value
Constant	22,592	3,621	6,239	**<0.001**
Age				
65-74(reference)	-	-	-	-
75-84(x_1)	-6.501	2.179	-2.983	**0.004**
Sex				
Female(reference)	-	-	-	-
Male(x_2)	-1.916	1.749	-1.096	0.276
Education status				
High school and higher education (x_3)	8.720	2.530	3.447	**0.001**
Secondary school (x_4)	3.623	2.020	1.794	0.076
Primary school(reference)	-	-	-	-
Marital status				
Married (x_5)	0.196	1.525	0.129	0.898
Single (x_6)	1.618	2.491	0.649	0.518
Monthly income				
Less than 2000 TL (x_7)				
2000-4000 TL (x_8)	5.127	1.966	2.608	**0.011**
Over 4000 TL (x_9)	15.635	2.658	5.881	**<0.001**
Number of hospital admissions in the last 3 months				
1-3(reference)	-	-	-	-
4-6(x_{10})	0.166	2.127	0.078	0.938
	n=98, R^2=0.587, Adj. R^2=0.44 (F=13.870, **p<0.001**)			

dividuals with diabetes over the age of 48, the mean TSOY-32 index score was found to be 22.89±13.76 (13). In the literature, the mean TSOY-32 index score was generally found to be lower in studies on elderly populations, and higher in studies conducted with younger populations with higher education levels. In our study, TSOY-32 index scores in older adults were calculated and they were found to be low as in the literature.

We determined that the level of health literacy decreased with advanced age. In fact, other factors affecting health literacy with age also contribute to the decline in health literacy with advanced age. Wu et al. examined the relationship between health literacy and age and health outcomes in patients with heart failure, and found that health literacy decreased with increasing age (14). In Geboers et al.'s study, the mean age of those with low health literacy (66.8) was significantly higher than those with adequate health literacy (64.9) (15). In a cross-sectional study conducted in Germany, the rate of individuals with low health literacy increased with advancing age. In this study, low health literacy was determined in 47.3% of individuals aged 15-29, 47.2% aged 30-45, 55.2% aged 46-64, and 66.4% those aged 65 and over (16) . In the existing literature, it has been observed that the level of health literacy generally decreases with advancing age. Consistent with literature, we found, a significant relationship between advanced age and low health literacy (p<0.001). In this result, we think that the low education level of the population we examined, the retirement of individuals with age, low pensions and social isolation with advanced age may be effective.

Extant literature has shown that there is no definite relationship between sex and health literacy. A previous study that investigated the relationship between health literacy and demographic and clinical characteristics of patients on hemodialysis found no relationship between low health literacy and age, sex, serological values, dialysis adequacy, general symptom burden, quality of life, and de-

pression (17). In another study conducted in Brazil, a statistically insignificant relationship was found between oral health literacy and sex (18). In our study too, no relationship was found between sex and health literacy, which is consistent with the literature (p=0.074).

It is generally accepted in the literature that there is no specific relationship between health literacy and marital status. In this study, no significant relationship was found between marital status and health literacy (p=0.145), which is consistent with findings of Nilsen et al., who also found no statistically significant relationship between health literacy and marital status in a study of patients with head and neck cancer (p=0.790) (19). Similarly, Erdogdu et al. they did not find a significant relationship between marital status and health literacy level (single: 36.9±7.2; married: 37.6±7.1; divorced: 36.9±7.2) (20).

Many studies have shown a positive relationship between health literacy and socioeconomic level. Apter et al. found that average household income and health literacy were positively correlated in their study (21). Another study reported a low health literacy rate of 47.1% and 40.1% in individuals with an income of up to $10,000, and between $10,001 and $30,000 (p<0.01), respectively (22). In our study, a significant relationship was found between low income level and low health literacy, which is consistent with the findings in literature (p<0.001). Considering that most of the individuals in our country only receive pensions as income at elderly ages, we can say that the low TSOY-32 index scores are related to this. Apart from this, it is stated in the literature that socioeconomic level and education level are generally in interaction, and we think that this situation may affect health literacy.

Results of previous studies have identified a positive correlation between high health literacy and education level. Baker et al. showed that the number of completed school years was associated with a high health literacy level (23). In another study,

lower education and income levels were positively correlated with lower health literacy (24). Sequeira et al. found a significant relationship between higher education levels and increased health literacy (25). Similarly, in this study, the level of health literacy increased with an increase in the education level (p<0.001), consistent with previous research findings. Considering that there is a relationship between education level and the ability to use information in general, it is natural for patients with higher education to have higher health literacy.

In our study, we could not find a significant relationship between the level of health literacy and the frequency of admission to the hospital in the last 3 months (p=0.067). There are contradictory results on this subject in the literature.

Limitations

The present study had some limitations. The selected patients were non-homogeneously distributed in terms of some characteristics such as educational and marital status. Since this was a single-center study where, a small number of patients participated, our results could not be generalized.

CONCLUSION

Our results showed that low health literacy was observed at a highly prevalent in patients over 65 years of age. Health literacy plays a key role in ensuring the effective and efficient use of health systems and health outcomes. From this perspective, improving the health literacy of individuals is crucial to enable the cost effective use of health services, and thus contribute to public health. The results from this study will guide future research.

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