ORIGINAL ARTICLE/ARAŞTIRMA MAKALESİ

Investigating the Relationship between Fall Prevention Behaviors and Health Literacy in Hospitalized Older Patients

Hastanede Yatan Yaşlı Hastaların Düşmeyi Önleme Davranışları ile Sağlık Okuryazarlığı Arasındaki İlişkinin İncelenmesi

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ABSTRACT

Aim: This study aims to investigate the relationship between falls, fall prevention behaviors, and health literacy in hospitalized older adults.

Materials and Methods: A descriptive, cross-sectional design was used. Study data were collected from patients aged ≥65 who were hospitalized in the hospital's internal medicine and surgery clinic between December 2021-June 2022. The data was collected using a Socio-demographic and Clinical Characteristics Form, the Health Literacy Scale (HLS), and the Fall Behavioral Scale for Older People (FaB). Multiple linear regression analysis was used to determine the contribution of factors associated with older patients' falling behaviors.

Results: The mean age of 204 older patients participating in the study was 75.38±8.95, and 57.8% were female. The older people's mean fall behaviors and health literacy scores were determined as 3.06±0.44 and 41.35+19.35, respectively. It was determined that the predictors of the cognitive adaptation sub-dimension of the falls behavioral scale for older people were understanding and applying and being single, the predictor of the protective mobility was fear of falling, the predictors of the pace were status of mobilization and fear of falling. In addition, the predictor of the practical strategies was fear of falling, the predictors of the displacing activities sub-dimension were the understanding sub-dimension of the HLS, presence of chronic disease, mobilization status, and fear of falling and the predictor of the changes in level was the mobilization status.

Conclusion: Practices aimed at increasing the health literacy of older people, reducing the regression in their cognitive status, and improving it may increase fall prevention behaviors.

Keywords: Health Literacy, Fall Prevent Behaviors, Older People

ÖZ

Amaç: Bu çalışmanın amacı, hastanede yatan yaşlılarda düşme ve düşme davranışları ile sağlık okuryazarlığı arasındaki ilişkiyi belirlemektir.

Gereç ve Yöntemler: Bu çalışmada tanımlayıcı, kesitsel bir desen kullanılmıştır. Çalışma verileri bir hastanenin dahiliye ve cerrahi kliniğinde yatan 65 yaş üstü hastalardan Aralık 2021-Haziran 2022 tarihleri arasında toplanmıştır. Veriler, Sosyodemografik ve Klinik Özellikler Formu, Sağlık Okuryazarlığı Ölçeği (SOY) ve Yaşlılar İçin Düşme Davranışları Ölçeği (FAB) kullanılarak toplanmıştır. Yaşlı hastaların düşme davranışları ile ilişkili faktörlerin katkısını belirlemek için multipl lineer regresyon analizi kullanılmıştır.

Bulgular: Araştırmaya katılan 204 yaşlı hastanın yaş ortalaması 75,38±8,95 ve %57,8'i kadındı. Yaşlıların düşme davranışları ve sağlık okur yazarlığı puan ortalamaları sırasıyla 3,06±0,44, 41,35+19,35 olarak belirlendi. Yaşlıların düşme davranışları bilişsel uyum alt boyutunun yordayıcılarının SOY anlama ve uygulama alt boyutu ve bekar olmak, güvenli hareket alt boyutunun yordayıcısının düşme korkusu, acelecilik alt boyutunun yordayıcılarının mobilizasyon durumu ve düşme korkusu olduğu belirlendi. Ayrıca düşme davranışları pratiklik alt boyutunun yordayıcısı: düşme korkusu, aktivite planında değişiklik alt boyutunun yordayıcıları: SOY anlama alt boyutu, kronik hastalığı varlığı, mobilizasyon durumu ve düşme korkusu, seviye değişiklikleri alt boyutunun yordayıcısının mobilizasyon durumu olduğu belirlendi.

Sonuç: Yaşlıların sağlık okur yazarlığını arttırmaya ve bilişsel durumlarında gerilemeyi azaltma ve geliştirmeye yönelik uygulamalar düşme önleme davranışlarını arttırabilir.

Anahtar Kelimeler: Sağlık Okuryazarlığı, Düşmeyi Önleme Davranışları, Yaşlı

INTRODUCTION

Falls cause disability, hospitalizations, increased health costs, and death in older people (1,2). The annual fall rate in older people is reported as 27% in hospital settings (3), and approximately half of those who fall have repeated falls (4). Causes of falls in old age include biological-medical, behavioral, environmental, and socio-economic factors. It has been stated that factors such as advanced age, being a woman, living alone, increased number of chronic diseases, medication use, and physical environment increase the risk of falls (5–7). Behavioral risks that cause falls in older people are haste, carelessness, fear of falling, misuse of assistive devices, wrong shoes, and not exercising (8). Since 2/3 of falls in older people are preventable, it is important to identify behavioral and environmental risk factors and take precautions (5,9,10). Identifying behaviors that pose a risk of falls increases the awareness of older people about the impact of their daily living behaviors on falls. Although there are studies on environmental risks, among the reasons for older patients' falls, studies on behavioral risks are limited.

Health literacy covers basic reading and writing skills and includes listening and understanding complex content, analyzing, making decisions, and using these skills in health-related situations (11,12). Health literacy is essential in protecting and improving an individual's health, as it enhances the individual's ability to acquire and use health information. Some studies have shown that health literacy is lower in older people, women, singles, and people with low education levels (13,14). People with poor health literacy experience decreased quality of life, non-compliance with treatment, inability to control diseases, and dissatisfaction with health services (15,16). Hospitalization and use of emergency services are increasing in individuals with low health literacy. In addition, it has been reported that these individuals participate less in screening programs, benefit less from preventive health services, and have less information about their diseases (16). The low level of individuals'

health literacy causes them not to understand their health status, fail to fulfill the recommendations given by health professionals and manage their self-care (17). The rate of health literacy was low in developed and underdeveloped countries. Almost 50% of European adults have limited health literacy, while older people over 75 have the highest rate of inadequate health literacy (18). Upon reviewing the existing literature, it was found that there is a paucity of research on the association between health literacy and falls, as well as fall prevention behaviors. . Therefore, This study aims to investigate the relationship between falls, fall prevention behaviors, and health literacy in hospitalized older adults.

MATERIALS AND METHODS
Design

A descriptive, cross-sectional study was conducted in a university hospital's internal and surgical clinic in Western Turkey between December 2021 and July 2022.

Sample

The research sample consisted of 204 hospitalized older patients. The criteria for including older people in the research sample were as follows: age ≥65 years; voluntary participation in the study; understanding and speaking Turkish; orientated to person, time, and place; and no speech or hearing impairments. The patients who were excluded from the study had a score of <23 on the Mini-Mental State Examination (MMSE) or were diagnosed with psychiatric (e.g., schizophrenia) or neurological (e.g., dementia diseases. G*Power version 3.1 was used for calculating the sample size in this study. After the study, the power of the study was calculated as 0.92 when the effect size, p, and sample size were taken as 0.31, 0.05, and 204, respectively.

The university hospital and the Non-Interventional Ethics Committee of Izmir Democracy University (2021/15-03-24.11.2021) approved this research. Written informed consent was obtained from the participants included in the study.

Data Collection

Data were collected using a Socio-demographic and Clinical Characteristics Form, the Health Literacy Scale, and the Falls Behavioral Scale for Old People (FaB).

After reviewing the literature, the researchers prepared the socio-demographic and clinical characteristics form (5,6). The form included questions about socio-demographic factors (age, gender, education, place of residence, households, chronic diseases, reasons for hospitalization, medications used continuously, history of falls, number of falls, falling in hospital, fear of falling, and use of assistive tools, etc.)

The Instrument for Assessment of Health Literacy was developed by Sorensen et al. in 2013 (19). The scale consists of 25 items and four sub-dimensions. These dimensions are accessing (5 items), understanding (7 items), appraising (8 items), and applying (5 items). Scores on the scale range between 25 and 125. As the score obtained from the scale increases, the level of health literacy increases. The standard deviation of the original form of the scale is 0.95, and Cronbach's alpha internal consistency coefficient of the subscales ranges between 0.90 and 0.94 (19). Aras-Çimen and Bayık Temel conducted Turkish validity and reliability research on the scale (20). The values for the time-dependent invariance of the scale are r=0.74 (p=0.05), and item-total correlations range between 0.20-0.72 (p=0.01). In addition, Cronbach's alpha value is 0.92 for the total scale and varies from 0.62-0.79 for the sub-dimensions. The reliability coefficients between the scores of the sub-dimensions and the total scale score range between 0.74 and 0.91 (p<0.01).

The FaB was created by Clemson, Cuming, and Heard in 2003. Uymaz and Nahcivan translated the scale into Turkish and tested its validity and reliability (21). The measure was used to evaluate the fall prevention practices of older individuals living in the community. This scale can be used in interviews as well as for self-rating purposes. Its design was intended to measure elderly citizens' knowledge of actions that could be protective against falls. A person is more likely to participate in fall prevention actions if their score is greater, whereas a lower score indicates riskier habits. The scale consists of 30 items and ten subscales. The subscales are as follows: (1) cognitive adaptations, which includes planning and reasoning (six items); (2) protective mobility (five items), which includes balancing environmental factors and supportive/preventive actions, (3) avoidance, which includes avoiding dangerous fall-related actions (five items), (4) Awareness (four Items): This category deals with dangers that people are aware of in their surrounding surroundings, such traffic, (5) Pace (two items), which refers to people's hurried actions, (6) Useful methods (three items), which include anticipating and preparing for fall-related risks (7). Displacing activities (one item), which entails going outside on windy days, (8) Being observant (one item), which entails being cautious, dealing with more difficult activities, such as being attention to steps while ascending up and down the stairs, and (10) Getting to the phone (one item), which entails the precautions used when attempting to reach objects, such as the telephone. Scores for the scale and its subscales are computed by adding all item scores and dividing the total by the number of items. Higher scores indicate that a person is likelier to engage in the safest fall prevention actions, whereas lower values indicate more hazardous behaviors. Scores might vary from 30 (risky fall behavior) to 120 (excellent fall behavior) (preventive fall behavior). The original FaB scale is valid and reliable, as evidenced by its excellent internal consistency reliability ($\alpha = 0.84$) and the test-retest reliability correlation value of 0.94 (p 0.01). The content validity index assessed the scale's validity to be 0.93. Cronbach's Alpha coefficients ranged from 0.10 to 0.81 for the subscales (21). Uymaz and Nahcivan developed the scale for Turkish culture (21). The modified scale's content validity index was 0.94, and the test-retest reliability correlation value was 0.96. The scale's Cronbach's Alpha coefficient was 0.90, suggesting good internal consistency, whereas the subscales' Cronbach's Alpha values

varied from 0.51 to 0.90.

Data Analysis

The research data was analyzed using the IBM SPSS Statistics 23 program. The descriptive statistics of frequency, percentage, mean, and standard deviation were employed for the descriptive data regarding patients. All independent factors associated with fall prevention behaviors were examined using correlation analysis. According to Cohen, Manion, and Morrison (2007), effect size values in correlational studies were interpreted as follows: r < 0.10 very weak, $0.10 \leq r < 0.30$ weak, $0.30 \leq r < 0.50$ moderate, $0.50 \leq r < 0.80$ strong, $r \geq 0.80$ very strong effects (22). The regression model includes the independent variables that significantly linked with fall prevention behaviors. Before developing the regression model, the standardized residual for the dependent variables and multicollinearity for the independent variables were investigated. To assess the presence of multicollinearity, the tolerance (.20) and variance inflation factor (>5) for all independent variables in the regression model were calculated. The findings indicated that the model had no multicollinearity, with the lowest tolerance of 0.34 and the greatest variance inflation factor of 2.06. Outliers were identified using Cook's distance and standardized residuals. The statistical significance level for including the variables in the regression equation was set at p<0.05.

RESULTS

The mean age of 204 older patients participating in the study was 75.38±8.95 (min=65, max=96); 57.8% were female, 51% were single, and 52% were primary or secondary school graduates. Also, 95.6% of the participants had a companion, 96.1% lived at home, and 91.2% did not live alone. It was determined that 92.2% of the hospitalized older people had a chronic disease, 58.8% had hypertension, 54.4% had diabetes mellitus, and 12.3% had heart failure. It was found that 36.3% of older people had a fall in the past year before hospitalization, 87.7% were afraid of falling, and 56.4% were terrified of it. The hospitalized older people's mean falls behavioral scale score was 3.06±0.44 (min=1, max=4). Their mean scores on the sub-dimensions of the falls behavioral scale were as follows: cognitive adaptations, 3.51±0.78 (min=1, max=4); protective mobility, 2.75±0.76 (min=1, max=4); avoidance, 3.23±0.40 (min=1, max=4); awareness, 3.21±0.70 (min =1, max=4); pace, 3.23±1.05 (min=1, max=4); practical strategies, 2.58±0.69 (min=1, max=4); displacing activities, 3.32±1.12 (min=1, max=4); being observant, 3.11±1.26 (min=1, max=4); changes in level, 2.34±1.44 (min=1, max=4); getting to the phone, 2.62±1.48 (min=1, max=4) (Table I). Participants' mean score on the total health literacy scale was 41.35+19.35 (min=25, max=105). Their mean scores on the sub-dimensions of the scale were 6.20±2.43 (min=5, max=15) on the accessing sub-dimension, 13.27±7.73 (min=7, max=35) on the understanding sub-dimension, 15.34±9.50 (min=8, max=40) on the appraising sub-dimension, and 6.52±3.27 (min= 1, max=4) on the applying sub-dimension. The clinical and socio-demographic characteristics of older people are given in Table I.

Table I. Distribution of socio-demographic and clinical characteristics of the hospitalized older people			
Variables	**X±SD**		
Age	75.38±8.95 (min=65, max=96)		
		n	**%**
Gender	Female	118	57.8
	Male	86	42.2
Marital Status	Married	100	49
	Single	104	51
Education status	Illiterate	31	15.2
	Literate	39	19.1

Table I. Distribution of socio-demographic and clinical characteristics of the hospitalized older people (Continued)			
Variables		**n**	**%**
	Primary School	106	52
	High School	16	7.8
	University	12	5.9
Status of having a companion	Yes	195	95.6
	No	9	4.4
Where does she/he live	Home	196	96.1
	Nursing Home	8	3.9
Who does she/he live with	Alone	18	8.8
	With someone	186	91.2
Presence of chronic disease	Yes	188	92.2
	No	16	7.8
Hypertension	Yes	120	58.8
	No	84	41.2
Diabetes Mellitus	Yes	111	54.4
	No	93	45.6
Heart Failure-Arrhythmia	Yes	25	12.3
	No	179	87.7
COPD*	Yes	17	8.3
	No	187	91.7
Thyroid disease	Yes	9	4.4
	No	195	95.6
Mobilization	Not needing assistance for mobilization	98	48
	Mobilization using an assistive device	106	52
Fall history (in the past one year)	Yes	74	36.3
	No	130	63.7
Fear of Falling	Not afraid	25	12.3
	Slightly afraid	7	3.4
	Moderately afraid	25	12.3
	Very afraid	32	15.7
	Terrified	115	56.4
Fall Behaviors Scale for Old People Total	3.06±0.44 (min=1, max=4)		
Cognitive adaptations	3.51±0.78(min=1, max=4)		
Protective mobility	2.75±0.76 (min=1, max=4)		
Avoidance	3.23±0.40 (min=1, max=4)		
Awareness	3.21±0.70 (min=1, max=4)		
Pace	3.23±1.05 (min=1, max=4)		
Practical strategies	2.58±0.69 (min=1, max=4)		
Displacing activities	3.32±1.12 (min=1, max=4)		
Being observant	3.11±1.26 (min=1, max=4)		
Changes in level	2.34±1.44 (min=1, max=4)		
Getting to the phone	2.62±1.48 (min=1, max=4)		

The total score of older patients on the falls behavioral scale had a statistically significant, negative correlation with understanding (r=-.199) and appraising sub-dimensions (r=-.228) of the health literacy scale, and mobilization status (r=-.185), and a statistically significant, positive correlation with fear of falling (r= .242) (p<.05). The mean scores of older people on the cognitive adaptations sub-dimension of the falls behavioral scale had a statistically significant, negative correlation with the accessing (r=-.138), understanding (r=-.326), appraising (r=-.424), and applying sub-dimensions (r=-.180) of the health literacy scale, and mobilization (r=-.413), and a statistically significant, positive correlation with marital status (r=.166) (p<.05). A statistically significant positive correlation was found between participants' mean scores on the protective mobility sub-dimension of the falls behavioral scale and fear of falling (r=248) (p<.05). The mean scores of older people on the avoidance sub-dimension of the falls behavioral scale had a statistically significant, negative correlation with the accessing (r=-.235), understanding (r=-.267), appraising sub-dimensions (r=-.262) of the health literacy scale, age (r= -.197), and mobilization (r=-.312) and a statistically significant, positive correlation with level of education (r=.157) (p<.05) (Table II).

Table II. Relationship of risk factors according to fall behaviors subscale score for older people											
	Fall Behavior Total Score	Cognitive adaptation	Protective mobility	Avoidance	Awareness	Pace	Practical strategies	Displacing activities	Being observant	Changes in level	Getting to the phone
Health Literacy Total	-.218**	-.385**	-.101	-.258**	-.263**	.331**	.039	.306**	.111	-.363**	.046
Accessing	-.011	-.138*	.097	-.235**	-.008	.121	.211**	.140*	.057	-.167*	.041
Understanding	-.199**	-.326**	-.120	-.267**	-.268**	.308**	.051	.337**	.143	-.356**	.028
Appraising	-.228**	-.424**	-.131	-.262**	-.267**	.332**	.031	.302**	.094	-.347**	-.001
Applying	-.051	-.180**	-.104	-.130	-.047	.236**	-.013	.186**	.145*	-.142*	.046
Gender[a]	-.132	.002	-.070	.111	-.084	.021	-.247**	-.215**	-.200**	.019	-.080
Age	-.048	-.078	-.004	-.197**	-.120	.109	.230**	.214**	.099	-.280**	.062
Marital status[a]	.069	.166*	.072	-.086	-.039	-.039	.050	.070	.129	.001	-.059
Education[a]	.019	.049	-.030	.157*	.168*	-.233**	-.242**	-.283**	-.112	.330**	-.123
Living alone[a]	.051	.135	.008	-.006	-.068	.014	.070	.142*	.011	-.037	.123
Presence of chronic disease[a]	-.011	.038	-.067	.046	.086	.016	-.028	-.216**	.040	.069	-.069
Mobilization[a]	-.185**	-.413**	-.050	-.312**	-.199**	.365**	.063	.341**	.081	-.415**	.108
Fear of Falling	.242**	.023	.248**	-.118	.041	.124	.352**	.265**	.156*	-.015	.164*
*p < 0.05, ** p<0.01, aSpearman's correlation											
Gender (male = 1, female = 0), Marital Status (single= 1, married = 0), Education (Primary School and Secondary School=1, High School=2, Undergraduate=3, Postgraduate education=4), Chronic Disease (yes = 1, no = 0),											

A multiple linear regression analysis was used to examine the impact of characteristics linked with older patients' fall behaviors. The variables found to have a moderate and highly significant correlation with the sub-dimensions of the falls behavioral scale were included in the regression model. The understanding sub-dimension (β=-0.326, p=0.018) and applying sub-dimension (β=0.226, p<0.001) of the health literacy scale, and being single (β= -0.317, p<0.001) were found to be statistically significant predictors of the cognitive adaptations sub-dimension of the FaB. These variables explained 28.6% of the variances. The fear of falling (β=0.183, p=0.009) was found to be a statistically significant predictor of the protective mobility sub-dimension of the falls behavioral scale. The fear of falling (β=0.207, p=0.002) and status of mobilization (β=0.271, p<0.001) were statistically significant predictors of the pace sub-dimension of the FaB. These variables explained 12.9% of the variances. The fear of falling (β=0.251, p=0.001) was a statistically significant predictor of the practical strategies sub-dimension of the falls behavioral scale. This variable explained 16.1% of the variances. The understanding sub-dimension of the health literacy scale (β=0.338, p=0.047), presence of chronic diseases (β=-0.234, p=0.001), the status of mobilization (β=0.168, p=0.37), and fear of falling (β=0.158, p=0.32) were statistically significant predictors of the displacing activities sub-dimension of the FaB. These variables explained 19.4% of the variances. The status of mobilization (β=-0.225, p=0.004) was a statistically significant predictor of the changes in the level sub-dimension of the FaB. This variable explained 23.4% of the variances (Table III).

Table III. The predictors of the sub-dimensions of the Falls Behavioral Scale for Old People			
	Beta	**t**	**p**
Cognitive adaptation			
Accessing	.023	.148	.882
Understanding	-.326	-2.387	.018*
Appraising	-.036	-.520	.604
Applying	.226	3.699	.000**
Being Single	-.317	-4.434	.000**
Mobilization	.023	.148	.882
Model R^2 : .307; Adjusted R^2 : .286; F: 14.534; p <.001.			
Protective mobility			
Fear of Falling	.183	2.653	.009**
Model R^2 : .034; Adjusted R^2 : .029; F: 7.037; p <0.05			
Avoidance			
Accessing	-.044	-.542	.588
Understanding	.021	.119	.906
Appraising	-.163	-1.020	.309
Applying	-.111	-1.340	.182
Age	-.107	-1.217	.225
Education	-.135	-1.597	.112
Mobilization	-.044	-.542	.588
Model R^2 : .072; Adjusted R^2 :0.44 ; F: 2.454; p =0.021			
Awareness			
Understanding	-.162	-1.061	.290
Appraising	-.227	-1.566	.119
Education	-.037	-.491	.624
Mobilization	-.053	-.671	.503
Model R^2 : .151; Adjusted R^2 : .134; F: 8.852; p <.001			

Table III. The predictors of the sub-dimensions of the Falls Behavioral Scale for Old People (Countinued)			
	Beta	**t**	**p**
Pace			
Understanding	.071	.449	.654
Appraising	.051	.348	.728
Applying	.066	.875	.382
Education	-.054	-.721	.472
Mobilization	.271	3.432	.001**
Fear of Falling	.207	3.079	.002**
Model R²: .151; Adjusted R²: .129 ; F: 7.030; p <.001.			
Practical strategies			
Accessing	.136	1.962	.051
Gender	-.074	-1.020	.309
Age	-.016	-.206	.837
Education	-.142	-1.838	.068
Fear of Falling	.251	3.471	.001**
Model R² : .187; Adjusted R² : .161 ; F: 7.480; p <.001.			
Displacing activities			
Accessing	-.113	-1.500	.135
Understanding	.338	2.000	.047*
Appraising	-.231	-1.554	.122
Applying	.013	.171	.865
Gender	-.123	-1.695	.092
Age	-.088	-1.135	.258
Education	-.084	-1.018	.310
Presence of chronic disease	-.234	-3.503	.001**
Living alone	.077	1.168	.244
Mobilization	.168	2.101	.037*
Fear of falling	.158	2.164	.032*
Model R² : .238; Adjusted R² : .194 ; F: 5.456; p <.001.			
Being observant			
Applying	.021	.297	.767
Being male	-.143	-2.318	.051
Fear of falling	.129	1.714	.088
Model R² : .064; Adjusted R² : .050; F: 4.593; p <.001.			
Changes in level			
Accessing	.000	.005	.996
Understanding	-.277	-1.648	.101
Appraising	.004	.028	.978
Applying	.074	1.024	.307
Age	-.045	-.609	.543
Education	.114	1.450	.149
Mobilization	-.225	-2.938	.004*
Fear of falling	.107	1.645	.101
Model R² : .264; Adjusted R² : .234; F: 8.744; p <.001.			
Getting to the phone			
Fear of falling	.082	1.166	.245
Model R² : .007; Adjusted R² : .002; F: 1.360; p >.001.			

DISCUSSION

This study determined that accessing, understanding, and applying sub-dimensions of the health literacy scale, the status of mobilization, fear of falling, marital status, and chronic diseases were predictors of fall prevention behaviors.

Older people with low health literacy have lower self-efficacy and weaker self-management skills (23). As a result, older persons with limited health literacy may be less capable of controlling their fall risk and remaining engaged in everyday life. Health literacy is essential for older adults to effectively manage their health and learn and execute fall prevention techniques. Jaffee et al. stated there was no significant relationship between low health literacy and falls after discharge among older people (24). However, Chesser et al. found that older people with good health literacy experienced fewer fall injuries (25). Our study shows that the sub-dimensions of health literacy and the sub-dimensions of falling behaviors are predictors. Health literacy can increase knowledge and practices for fall prevention and reduce falls.

Our study determined that the understanding and applying sub-dimensions of the health literacy scale were predictors of the cognitive adaptations sub-dimension of the falls behavioral scale. Cognitive adaptations for fall prevention behaviors indicate the score for individuals' perception of the measures taken for fall prevention. Eronen et al. stated that they associated better health literacy with better cognitive status, fewer depressive symptoms, and better physical performance (26). Another study indicated that older adults with poor cognitive function were at risk of having low health literacy, which may affect their skills to improve health and self-manage diseases (23,27,28). It is stated that cognitive and physical training improves applications for the number of falls, balance, walking distance, and precautions against falls in older people (29). Implementing developmental practices for understanding and applying health literacy can increase cognitive

adaptation to fall prevention. Wallace et al. reported a positive relationship between sensory loss and low health literacy in older adults, and the severity of hearing loss increases the likelihood of low health literacy (30). Practices that can help improve or maintain the cognitive process during aging, such as social participation and physical activity, can help maintain health literacy skills (31). Protecting the cognitive health of older people and providing them with cognitive training can increase their health literacy to prevent and reduce falls.

Our study determined that fear of falling was a predictor of the protective mobility, pace, and practical strategies sub-dimensions of the falls behavioral scale. It is known that older people who have a fear of falling walk more slowly and have limited mobility (32). A study conducted with hospitalized older people stated that the fear of falling reduced movement and physical activity (33). According to the study conducted by Damar et al., older adults who experienced a fear of falling exhibited reduced postoperative mobilization. (34). Slower movements, difficulty with everyday activities, diminished social activities, and a greater fear of falling with age may induce older people to practice safer moves (35). Furthermore, older people utilize assistance gadgets such as walking sticks and walkers, which slow them down, safeguard them, and avoid falls. According to a systematic study, the essential behavioral modifications to reduce falls are exercise, walking, and balance training (10). As a result, thorough fitness training programs could be offered to reduce falls and the fear of falling.

It was determined that the understanding sub-dimension of the health literacy scale, the presence of chronic diseases, the status of mobilization, and fear of falling were predictors of the displacing activities sub-dimension of the falls behavioral scale. The displacing activities sub-dimension of the falls behavioral scale involves the plans of older people made cognitively for the prevention of falls. Older people with a high understanding of health literacy have higher levels of cognition and perception, which may help them make

plans to prevent falls. Adequate health literacy in older people is associated with a healthy lifestyle and increases physical activity, healthy eating, and social participation. Therefore, it is stated that health literacy is essential in promoting health behaviors (exercise and diet), similar to the results of our study (36). Low health literacy may result in less use of fall prevention practices. Fall prevention training given to older people should also be visual, auditory, and straightforward. Improving health literacy can help older people to manage their health better (37) and strengthen their fall prevention practices. Studies have shown that low health literacy is associated with low physical and social quality of life (38). A systematic review stated that reading comprehension, reasoning, and numeracy skills were strongly associated with health literacy (31). For this reason, education programs prepared for fall prevention should be suitable for low health literacy, audio-visual, and repetitive. In addition, using a scale for fall prevention behavior literacy can provide a more detailed evaluation of patients on this subject.

The limitation of this study was that it was conducted in older patients hospitalized in internal medicine and surgery clinics; while patients stay longer in internal medicine, they can stay shorter in the surgical service. For this reason solely, the relationship between health literacy and fall prevention behaviors specific to patients hospitalized in different clinics can be examined. One of the study's strengths is the collection of study data by allowing patients to ask questions through face-to-face interviews. The other is that while there are studies on fall and health literacy in the literature, our study reveals the relationship between fall prevention behaviors and health literacy.

CONCLUSION

Our study determined that older people with low health literacy had worse fall prevention behaviors. Increasing health literacy can contribute to developing fall prevention behaviors and reducing falls. It can be recommended to carry out studies on the effects of approaches to increase the health literacy of older people on

falls and fall behaviors.

Conflict of Interest

The authors declare that they have no conflict of interests regarding content of this article.

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Ethical Decleration

Ethical permission was obtained from the İzmir Democracy University, Medical Faculty Clinical / Human Research Ethics Committee and the hospital for this study with 2021/15-03-24.11.2021. Written informed consent was obtained from the participants included in the study.

Author Contributions

Concept: HTD, Design: HTD, BG, Supervising: HTD, BG, GA, Financing and equipment: HTD, Data collection and entry: BG, GA, MÖ, Analysis and interpretation: HTD, GA, Literature search: BG, GA, MÖ, Writing: HTD, Critical review: GA, MÖ.

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