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Validity and Reliability of Turkish Version of the Self-Awareness of Falls in Elderly Scale Among Elderly Inpatients

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Abstract

BACKGROUND/AIMS: This research was conducted methodologically to assess the Turkish adaptation, validity, and reliability of the Self-Awareness of Falls in Elderly (SAFE) Scale.

MATERIALS AND METHODS: This methodological study was conducted with 346 elderly individuals who received inpatient treatment in the hospital. Demographic Characteristics Questionnaire and the Awareness of Falls in Elderly Scale were used as data collection tools.

RESULTS: The average age of elderly individuals is 71.20±5.8, they have at least one chronic disease, 19.2% of them have dropped at least once in the past year, and 36.7% are afraid of falling. Language adaptation of the scale was provided using the translation and back translation method. Ten experts' opinions were taken for content validity and Content Validity Index was found to be 0.942. Because of factor analysis, it was found that the scale obtained in the Turkish adaptation consisted of 21 items and 4 sub-dimensions, the items formed in the sub-dimensions of the scale showed a different structure from the original scale. The reliability of the scale was examined by internal consistency and stability (test-retest). The internal consistency Cronbach's Alpha coefficient of the scale was calculated as 0.811.

CONCLUSION: As a result, the scale obtained because of the Turkish adaptation study of the SAFE scale is a valid and reliable measurement tool.

Keywords: Nursing, falls in elderly, scale, self-awareness, elderly inpatients, validity and reliability

INTRODUCTION

Falling is the main reason for unintentional injury around the world.[1] Falling is an important geriatric problem not only due to its prevalence but also because of its consequences.[2] Even small-scale falls may lead to injuries and disabilities, which negatively affect the health and independence of the elderly, and by 12.1% to fatal injuries.[3] Falling is the most common type of accident among people more than 65 and may result in death, hospitalization, disability, loss of independence and fear of falling which may also cause a limitation of physical activities.[4] One-third of people aged greater than 65 falls every year and half of the them experience recurring falls. Furthermore, people who fall more than once are under the highest risk of injury and falling.[5] Rate of falls per year among elderly people more than 65 is 32%–42%, while this rate is 50% for people above 85.[6] Moreover, it is estimated that the global rate of falls within the total hospital death rate has risen by 114.3% while the rate of falling related deaths in total deaths increased by 43.1%.[7]

Falling is a patient security problem that occurs mostly to hospitalized elderly patients and has costly medical, social and

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economic consequences.[1,4,8] Thus, it is clinically vital to prevent elderly patients from falling. Studies have confirmed various objective risk factors including personal characteristics (i.e.; age, gender, marital status, and education), medication, physical functions, cognitive behavior, and environmental factors.[9] Generally, more than one reason is responsible for falling in the elderly individuals. The factors that are proved to be risky according to research are; being over 65 years old, prior history of falling, fear of falling, being female, living alone, having lower limb prostheses, using a walking aids, wearing slippers, medical conditions (stroke, Parkinson's, incontinence, acute diseases, arthritis, feet problems, dizziness, syncope, orthostatic hypotension, vitamin D deficiency, depression, diarrhea, chronic pain, sleeplessness, vascular diseases), changes in blood glucose level, cognitive disorders, executive function disorders, medication (benzodiazepine, antihypertensive, psychoactive medications), polypharmacy (actively using more than 4 medications), sarcopenia, fragility, having weak lower limbs, walking disorders, limited daily life activities, sedentary life style, visual impairment,[10] balance disorders, slippery floor, having no sturdy handles to hold on to in toilet and next to bed, wobbly IV poles, high platform beds, objects around that are not fixed.[8,11] In the study by Fernández et al.[12], using hypnotic, sedative, diuretic and opioids and also polypharmacy were risk factors in the elderly, especially among female population. Hignett et al.[13] analyzed US national incident data and concluded that the factors that cause falls in inpatients include dizziness, vision, and hearing disorders and medication. In their study, Li et al.[14] found that the main risk factors resulting from fall-related injuries are internal factors, not situational or environmental risk factors. In a systematic research done between 1995 and 2010, 87 studies were analyzed and according to the results of this study, it was determined that fractures in every part of the body were common, yet most of the fractures were observed in pelvis.[15] The results of this study create significant awareness in the evaluation of fall risk factors of elderly patients.

Realizing the risks before elderly patients fall and arrangements toward prevention must have high priority.[8] Falls risk factors should be considered discretely for each older patient and it must be ensured that elderly patients take measures against falls themselves. Patients with a low awareness of falls risk may overlook related risks and fail to follow prevention strategies as well. Thus, in addition to the objective assessment of falls risk, evaluating the awareness of a patient toward falls risks by care personnel may actively help prevent falls during clinical care. In this respect, it is vital to help elderly patients gain awareness toward falls.[16,17] It is expected that patients who are aware of fall risks and behaving accordingly will decrease the rate. While helping elderly patients realize factors that cause falls through an accurate measurement tool and raising their awareness on falls risks, topics that they should pay attention to will also be specified.[16] Additionally, many scales such as St. Thomas Risk Assessment Tool in falling elderly inpatients (STRATIFY), Hendrich fall risk model II (HFRM) and Morse Fall Score (MFS) was used to determine falls risk during clinical care and evaluate the group at highest possible level. These tools assess falls in multiple places and can assess falls risk in elderly inpatients and determine risks.[18] However, these tools are used in accordance with the views of care personnel; as a result, individual perception of falls in the elderly inpatients are not taken into consideration. Commitment to falls prevention strategies by elderly people who have an awareness of falls risk is higher;[19] yet, few scales analyze subjective fall risks. Hence, there is a need for developing an appropriate tool to assess falls risk in elderly patients. This study adapts the Self-Awareness of Falls in Elderly Scale (SAFE) developed by Shyu et al.[16] which can determine self-awareness of elderly patients on falls into Turkish, and to analyze its reliability and validity. In tandem with other falls risk assessment methods, the SAFE scale could assist in raising awareness against falls risk of elderly inpatients and determining high-risk groups. This study was conducted to determine the validity and reliability of the SAFE scale for Turkish society.

Research Questions

1. What is the reliability coefficient of the Turkish version of the SAFE scale?
2. Is the confirmatory factor analysis compatible with the pre-factor structure?
3. Is the SAFE scale suitable for determining Turkish elderly individuals' risk of falling risks?

MATERIALS AND METHODS

The research is methodological and descriptive. It was conducted between July-December 2019. The sample has more than 10 times the number of 21 items[20,21] and consists of 346 patients. The sample of the research were selected, via improbable sampling,[20,21] out of volunteer patients aged 65 and older, with at least one chronic disease, without cognitive disabilities or any other conditions that may cause difficulty in understanding the questions.[8,16] Patients with at least one chronic disease were included in the sampling, since elderly patients with chronic disease were more likely to be hospitalized and had a risk of falling. The study of medical and surgical clinic was conducted in a public hospital in western Turkey.

Data Collection Tools

In data collection, a demographic questionnaire and "the SAFE scale" was used.

Demographic Information Questionnaire includes questions on the patients' age, gender, marital status, financial information, social security, chronic diseases, education, reason for

hospitalization, prior history of fall, and history of falls in the last one year and the fear of falling.[8,16] "Patients with at least one chronic disease were included in the sampling, since elderly 42 patients with chronic disease were more likely to be hospitalized and had a risk of 43 falling" sentence has been added.

The SAFE scale was developed in Northern Taiwan by Shyu et al.[16] in 2018 to measure the awareness and risk measures of elderly patients about fall risk factors. The original language of the scale is English and consists of 21 items in four sub-dimensions that are awareness of activity safety and environment, awareness of physical functions, awareness of medication, awareness of cognitive behavior. The scale has a 5-point Likert, one being the lowest, 5 as the highest point. The maximum total point is limited to 105, while the lowest total result can be 21. High results of the scale show that elderly patients are highly aware of the risk factors associated with falling and take precautions. In the original of the scale, Cronbach Alpha coefficient is α=0.81. In the four sub-dimensions, α=0.85, α=0.86, α=0.92, and α=0.70, respectively, indicating adequate internal consistency across items. The Content Validity Index is 0.83, test-retest correlation is r=-0.71 ($p<0.001$).[16]

Application of Data Collection Tools

The initial application of the study was conducted on 91 patients. Because there were no changes made in data collection tools, the patients who attended the initial application were added to the sample size. Research data was collected between July-November 2019 in the hospital through face-to-face interviews from 346 patients. In the context of the study, after the patients were informed about the purpose of the study and their verbal consent was acquired, Demographic Information Questionnaire and the SAFE scale were applied. For each patient, the average duration of filling data collection forms was 30 min. The data were collected by the researcher. It was confirmed by their caregivers to describe the reliability of the patient's responses. The meeting was held in a safe, comfortable, and undisturbed environment.

Translation-retranslation method was used to determine language validity. Scale was initially translated from English to Turkish by five experts separately. The translations were examined by the researchers and a draft form of the scale were obtained. After the translation, the draft was translated back to English by two experts separately. The original scale and retranslation were compared, and necessary changes were made to obtain the final scale. After the completion of translation and retranslation of the form, it was submitted to 10 experts who work on falls in the elderly for content validity. Content Validity Index (CVI) was implemented to evaluate expert opinions. CVI assessment criteria are; 1- not appropriate, 2- not at acceptable level (items must be revised to increase appropriateness), 3- fairly appropriate (minor changes are needed), and 4-highly appropriate.[20,21] At the end of grading, content validity index (CVI) was calculated. According to expert opinions, CVI for the items returned 0.942. Construct validity of the study was determined using exploratory and confirmatory factor analysis. Turkish adaptation of the form was reorganized according to expert opinions and initial trial was conducted on 91 elderly patients outside the actual sampling population.

The reliability study for the research was accomplished through internal consistency and test-retest application.[22] To assess time invariance of the scale, a test-retest analysis was applied to 91 patients after a period of 3 weeks.[20,21]

Ethics

Before starting the study, the necessary permissions were obtained from the researcher who developed the original scale for the use permit of the scale, in a public hospital and the Provincial Health Administration in western Turkey. Ethics committee approval was obtained from Muğla Sıtkı Koçman University Human Research Ethics Committee on 07.02.2019, protocol no: 190023/decision no: 23. Additionally, the purpose of the study was explained to the elderly individuals and their relatives, and their verbal consent was obtained.

Statistical Analysis

The analysis for the study was conducted using IBM SPSS V25 and IBM SPSS AMOS software packages. Language and content validity was calculated to ensure the validity of the scale. An item analysis was conducted, and Pearson Moment Correlation coefficients were calculated for item-total scores to evaluate internal consistency of the scale. Test-Retest method was implemented to determine whether results would remain unchanged and, Cronbach's Alpha coefficient and internal consistency (item total correlation scores) were calculated to evaluate the validity of the scale.[23] To determine whether the data obtained in the study are compatible with factor analysis, Bartlett and Kaiser-Meyer-Olkin (KMO) tests were applied. Bartlett Sphericity (chi-square) was used to evaluate the suitability of parametric methods on the data.[24] To determine the number of factors in the study, eigenvalues and scree plot were implemented on items. While principal components factor analysis was used to explain the factor structure, Varimax was chosen as the rotation method. Confirmatory factor analysis was performed to evaluate the scale structure. Modification indices in obtaining the suitable model are as the following: X^2/SD, RMSA, GFI, AGFI, NFI, TLI, PNFI, PCFI, and CFI.[23] The level of significance was set at $p<0.05$.

RESULTS

Findings Related to Demographic Information of Patients

Of the patients who took part in the survey, 54.3% are females with an average age of 71.20±5.8, 45.1% are married, 55.6% have

a balanced financial situation, and 89.6% have social security. Moreover, 83.2% of elderly patients were hospitalized for medical treatment and have at least one chronic disease, 26% of which are related to neurological, 23.2% of them to cardiovascular, and 19.2% to respiratory system disorders. It was seen that 19.2% of the elderly have fallen at least once in the past year and 36.7% have a fear of falling.

Evaluation on Construct Validity of the SAFE Scale

Exploratory and confirmatory factor analysis was used to evaluate the construct validity of the SAFE scale, which was developed by Shyu, et al.[16], consisting of 21 items under four sub-dimensions.

Evaluating Exploratory Factor Analysis Results of the SAFE Scale

For the structure validity of the scale, initially an exploratory factor analysis was implemented.[23] In factor analysis, the factors with an eigenvalue of one and over were studied. Before statistical analysis, KMO value and Bartlett sphericity test results were evaluated for the sufficiency of the sampling. Because of exploratory factor analysis, KMO value for the scale returned as 0.771 and Bartlett sphericity test results were found as X^2=1,965,395, p<0.001. A high Kaiser-Meyer Olkin value means that each variable in the scale can be predicted accurately by other variables.[23] It was concluded that a sufficient structure for factor analysis was accomplished, considering KMO value of 0.771. Cronbach's Alpha value was calculated as α=0.811.

While using principal components factor analysis for factorability to explain factor structure of the SAFE scale, Varimax, which is the best method to explain variance, was chosen as the rotation method. Table 1 displaying eigenvalues and variance percentage and scree plot graph is given below.

According to the results of exploratory factor analysis, while the first factor can explain 21.791% of the total variance, the second factor can explain 10.613%, the third factor 9.756%, and lastly the fourth factor can explain 6.155% of the total variance. Thus, it is seen that four factors with eigenvalues more than one of 21 items explain 48.316% of the total variance. Factor structures are illustrated through scree plot (Figure 1).

The distribution of the items forming the four factors in the original structure of the SAFE scale was evaluated. A rotated component matrix was used to determine which factors correlate strongly with items. At the end of the evaluation, it was observed that the decomposition of items followed the criteria (Table 2).

It was seen that there are structural differences within results compared to the original structure of the SAFE Scale (Table 3). Emerging factors were named with the help of Activities of Daily Living model by Roper, Logan, Tierney.[25] New sub-dimensions formed through factor analysis that are; Activity Safety has six items, Awareness of Physical Functions and Medication consists of seven, Habits and Environmental Awareness is comprised of four, and Cognitive Behavior Awareness sub-dimension has four items (Table 3).

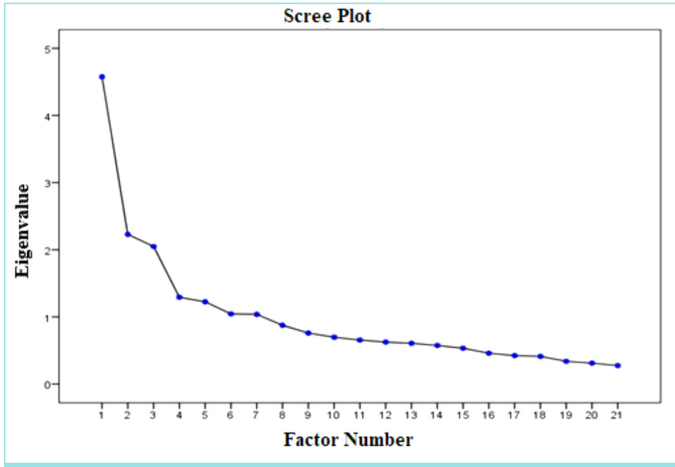

Figure 1. Scree plot of SAFE Scale on the elderly (n=346)
SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

Sub-dimensions of the SAFE scale and item total correlation scores are given in Table 4. When the sub-dimensions of the SAFE scale are evaluated, correlation values of F1 sub-dimension are found to be between 0.340–0.541, correlation values for F2 sub-dimension returned between 0.294–0.363, for F3 sub-dimension the values are between 0.355–0.641 and finally for F4 sub-dimension, the values range between 0.335–0.453 (p<0.001).

Findings Related to Time Invariance of the SAFE SCALE

Time invariance was determined by reapplying the scale to 91 individuals who accepted reapplication, 21 days after the initial questioning under similar conditions. In the analysis, it was found that two measurements have a strong relationship between (r=0.575, p<0.001) and the scale results do not differ in time.

Findings on the SAFE Scale Confirmatory Factor Analysis

Confirmatory factor analysis was conducted to confirm the suitability of factors obtained from exploratory factor analysis of the SAFE Scale structural validity. At the end of the validity study of the scale carried out in Turkey within a theoretical framework, the model of this structure, which consists of 21 items and four sub-dimensions, was assessed with factor analysis. Findings on confirmatory factor analysis are given in Figure 2.

According to the results of CFA conducted for the construct validity of the measurement tool, X^2/SD, which displays the goodness of fit, were calculated as CMIN/df=2.058, RMSEA=0.055, GFI=0.918, AGFI=0.899, NFI=0.827, TLI=0.877, PNFI=0.666, PCFI=0.725, and CFI=0.901. X^2/degree of freedom was found to be significant with the value of 2.058. When the values obtained

from goodness of fit indicators were studied, it was found that the new scale with 4 sub-dimensions proves an acceptable fit (Table 5).

In the study, it was seen that there is a strong relationship between two measurements (r=0.575, p<0.001) and the scale is time invariant (Table 6).

DISCUSSION

This is a study for the validity and reliability of Turkish language adaptation of the SAFE Scale which was developed by Shyu et al.[16] originally in English to analyze falls risk awareness in the elderly patients. The SAFE scale components that are the critical characteristics of falls risk in the elderly consist of four factors:

Table 1. Factor structure of the SAFE Scale (n=346)

Factor	Eigenvalue	Variance percentage	Total variance percentage
Factor 1	4.576	21.791	21.791
Factor 2	2.229	10.613	32.405
Factor 3	2.049	9.756	42.161
Factor 4	1.293	6.155	48.316

SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

Table 2. Rotated component matrix for the SAFE Scale (n=346)

Items			Components			
			1	2	3	4
Activity Safety F1	3	Stacking things by or on the bed makes them easier to retrieve.	0.742	0.012	0.024	0.108
	1	I sit down to take rest when feeling uncomfortable.	0.703	0.081	0.108	0.008
	2	Whether handrails are installed in the bathrooms or restrooms does not affect me.	0.702	0.257	0.021	-0.021
	4	I walk by the wall in crowded environments.	0.684	0.083	0.056	0.364
	5	When the floor is wet, I walk carefully so I will not fall down.	0.602	-0.124	0.076	0.419
	11	I use a walker to prevent myself from falling when I get up and begin my day.	0.259	0.164	0.035	0.069
Awareness of Physical functions and medication F2	13	Although I have difficulty in hearing, it does not cause me to fall.	0.009	0.668	-0.025	0.029
	12	Although I have poor eyesight, it does not cause me to fall.	0.003	0.663	-0.047	0.211
	15	I know whether the daily medications I take can make falls more likely.	0.172	0.574	0.197	-0.078
	14	Although I do not sleep well at night, lack of sleep does not cause me to fall.	-0.060	0.550	-0.035	0.321
	16	I have to take more than four types of medication every day, but they do not make falls more likely.	-0.020	0.533	0.363	0.088
	10	Although I get dizzy sometimes, it does not cause me to fall.	0.128	0.465	-0.041	0.082
	9	Although my steps are unstable. I do not fall when I get up from bed and walk to the restroom if I hold on to something.	0.207	0.455	0.083	0.018
Awareness of Cognitive Behavior F4	19	I tend not to bother others when I need to use the restroom at night.	-0.046	-0.025	0.818	0.133
	18	I do not like to bother nurses.	-0.031	-0.008	0.760	0.097
	20	I think I am not likely to fall.	0.312	0.154	0.657	-0.040
	21	Although I am getting older, I will not fall as long as I am careful.	0.315	0.040	0.548	-0.187
Habits and Environmental Awareness F3	8	I wear slip/fall-preventing footwear.	0.199	0.232	0.054	0.752
	7	I leave on a small lamp at night while asleep.	0.266	0.228	-0.063	0.707
	6	I sit on the bed for 10 minutes after waking up every morning before I get up and begin the day's activities.	0.520	-0.054	0.090	0.556
	17	Although the medications I take are likely to cause falls, I will not fall because I am used to them.	-0.112	0.297	0.376	0.432

SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

Table 3. Comparison of factor structures between the SAFE scale and its Turkish adaptation (n=346)

Original sub-dimensions of SAFE scale	The items of the original sub-dimensions of SAFE scale	Sub-dimensions of the Turkish adaptation of SAFE scale	Items from the sub-dimension of the Turkish adaptation of SAFE scale
Activity safety and environmental awareness (Factor 1)	1,2,3,4,5,6,7,8	Activity safety (Factor 1)	1,2,3,4,5,11
Awareness of physical functions (Factor 2)	9,10,11,12,13,14	Awareness of physical functions and medication (Factor 2)	9,10,12,13,14,15,16
Medication awareness (Factor 3)	15,16,17	Habits and environmental awareness (Factor 3)	6,7,8,17
Cognitive behavior awareness (Factor 4)	18,19,20,21	Cognitive behavior awareness (Factor 4)	18,19,20,21

SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

activity safety and environmental awareness, physical function awareness, awareness of medication and awareness of cognitive behavior. After ensuring language validity, expert opinions were gathered from ten experts through Davis technique and as a result, CVI value which is expected to be above 0.80 was calculated as 0.942. This figure was found as acceptable in the literature.[26] Because of content validity, it was found that the language structure of the SAFE scale which was interpreted into Turkish is comprehensible and has suitable content.

EFA was conducted for the construct validity of the scale and factors with an eigenvalue of 1 and higher were interpreted. According to EFA results, it was determined that 21 scale items with eigenvalues greater than 1 comprise of four factors, explaining 48.316% the of total variance. In the original scale model, based on the model structure, four factors together constituted 61.15% of the variance.[16] When determining the factors, a meaningful interpretation was expected and achieved by loading at least two variables onto one factor.[22,27] High levels of explained variance is an indicator that it measures the concept or the construct effectively and it was seen that the variance in the scale is sufficient.[22] It was found that the acceptance level of items in the factor is high, thus no items needed to be removed from the scale because none of the items had a load value below 0.259 (Table 2). A high level of item acceptance in the factor, or the difference between load values of the item on two or more factors being below 10% should be considered when evaluating item-factor relationship.[24]

Another factor analysis method which was used as a validity criterion; EFA is a process that determines whether the items in the scale will group under different dimensions.[20] According to the results of exploratory factor analysis, items in the original SAFE Scale developed by Shyu et al.[16], matched with 21 items in four sub-dimensions in the Turkish adaptation of the scale and proved to explain 48.316% of the total variance. Similar to the original study in which the scale was developed, adapted scale proved a good fit level. However, a difference in the factor pattern was detected (Table 3). It can be assumed that the scale, created as an adaptation to Turkish, was formed as a distinctive scale. It is common for scales to vary in construct validity analysis when they are applied in different countries or

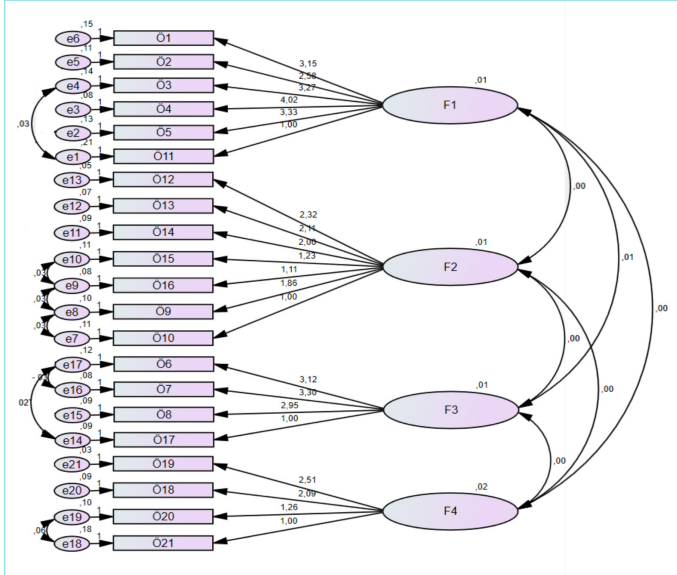

Figure 2. SAFE Scale confirmatory factor analysis distribution (n=346).

SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

Table 4. The SAFE Scale sub-dimensions and item total correlation scores (n=346)

Items	Item-sub dimension score correlations	Sub-dimension score- scale score correlations
Stacking things by or on the bed makes them easier to retrieve.	0.541**	0.859
I sit down to take rest when feeling uncomfortable.	0.526**	
Whether handrails are installed in the bathrooms or restrooms does not affect me.	0.512**	
I walk by the wall in crowded environments.	0.637**	
When the floor is wet, I walk carefully so I will not fall down.	0.544**	
I use a walker to prevent myself from falling when I get up and begin my day.	0.340**	
Although I have difficulty in hearing, it does not cause me to fall.	0.329**	0.618
Although I have poor eyesight, it does not cause me to fall.	0.363**	
I know whether the daily medications I take can make falls more likely.	0.352**	
Although I do not sleep well at night, lack of sleep does not cause me to fall.	0.359**	
I have to take more than four types of medication every day, but they do not make falls more likely.	0.361**	
Although I get dizzy sometimes, it does not cause me to fall.	0.294**	
Although my steps are unstable, I do not fall when I get up from bed and walk to the restroom if I hold on to something.	0.331**	
I tend not to bother others when I need to use the restroom at night.	0.346**	0.577
I do not like to bother nurses.	0.335**	
I think I am not likely to fall.	0.453**	
Although I am getting older, I will not fall as long as I am careful.	0.388**	
I wear slip/fall-preventing footwear.	0.553**	0.508
I leave on a small lamp at night while asleep.	0.543**	
I sit on the bed for 10 minutes after waking up every morning before I get up and begin the day's activities.	0.601**	
Although the medications I take are likely to cause falls, I will not fall because I am used to them.	0.355**	

**p<0.001 level of significance, SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

regions. A construct designed for a specific culture may appear in a different constitution in different settings.[28] This situation is a reflection of the difference in the concept people in different countries have in their minds. In this respect, analysis results are valid only for the population in a region, not countries or regions themselves. In our country, chronical care environments are mostly known to be hospitals with inpatient treatment, as a result people with chronic diseases admit to hospitals at first to get medical care service. Patients' relatives are expected to be present as care attendants. Thus, extra measures to prevent the elderly inpatients from falls are not taken by administrations. Another reason for the difference may be the duration of hospitalization and care environment that can affect nurse-patient relationship, causing a difference in factor pattern.

There is a widely accepted assumption that using a larger sample size leads to factor loads having more accurate predictions on population-related loads and tend to provide more consistent results.[24] The sampling included 346 patients for the 21 items in the study and it was seen in the KMO analysis result that a favorable structure for factor analysis was obtained. According to the results of exploratory factor analysis conducted for the construct validity of the measurement tool, X^2/SD, which determines the level of fit, was calculated as X^2/SD CMIN=2.058, RMSEA=0.055, GFI=0.918, AGFI=0.899, NFI=0.827, TLI (NNFI)=0.877, PNFI=0.666, PCFI=0.725, and CFI=0.901. X^2/freedom level proved significant with a value of 2.058. According to confirmatory factor analysis, factor loads for scale items are above 0.30 and the items grouped under the factors displayed a similar distribution to the original scale. In the original scale, EFA factor loading >0.40, CFA X^2/SD <3.0, RMSEA <0.08, SRMR <0.80, CFI, NNFI, and IFI >0.90.[16] The factor loadings of all items in the model ranged from 0.31 to 0.96 for the original of the scale.[16] In the construct validity of the scale, it was concluded that the four-sub-dimension scale is acceptable (Table 5).

Table 5. Goodness of fit indicators of the SAFE scale confirmatory factor analysis (n=346)		
Fit indices	**Value**	**Acceptable range**
Good fit indices		
GFI	0.918*	≥0.90 good
AGFI	0.899*	≥0.90 good
RMSEA	0.055*	0.08≤ acceptable ≤0.06; 0.06≤ good ≤0.05
Relative fit indices		
NFI	0.827	≥0.90 good
TLI (NNFI)	0.877	≥0.90 good
CFI	0.901*	≥0.95 good ≥0.90 good ≥0.80 acceptable
Parsimony fit indices		
X^2/df (CMIN/df)	2.058*	<3 good <5 acceptable
PNFI	0.666*	≥0.50 good
PCFI	0.725*	≥0.50 good

*: Significant values, GFI: Goodness of fit index, AGFI: Adjusted goodness of fit index, RMSEA: Root mean square error of approximation, NFI: Non-normed Fit Index, TLI: Tucker-Lewis Index, CFI: Bentler's Comparative Fit Index, PNFI: Parsimonious Normed Fit Index, PCFI: (Parsimonious Comparative Fit Index, SAFE: Self-Awareness of Falls in Elderly Scale, n: number.

For the reliability of the scale, internal consistency (item analysis, Split-Half) and time invariance (test-retest method) were preferred. Cronbach's Alpha coefficient for the original SAFE scale was calculated as α=0.81 by Shyu et al.[16] Cronbach's Alpha value for the first adaptation of the scale to Turkish society was calculated as α=0.811. Considering the result related to the Turkish language adaptation of the scale, Cronbach's Alpha value proves a high reliability ($0.81<\alpha<1.00$).[12]

Total scale correlation values of the items are between 0.294 and 0.601, all values for item total correlation were above 0.20, which is accepted as lower limit.[20] Item-total score correlations related to the scale were found to be statistically significant at $p<0.05$ significance level, and therefore no item was removed from the scale. At the end of question average test, it was seen that the results of the averages were different.

According to Table 6, considering the strong correlation between Cronbach values and halves, it was concluded that a sufficient and good reliability was achieved.[17] Test-retest technique was favored in the study and a correlation analysis was conducted accordingly. The scale was applied to 91 people 3 weeks after the first application. Total correlation value for the scale, r was calculated as 0.575 and it was interpreted as a statistically significant relationship ($p<0.05$). In the original of the scale, the total score correlation value was determined as r=-0.71 and it was found statistically significant ($p<0.001$).[16] Correlation and meaningful relation show that the scale has the capacity to provide similar results in recurring measurements and is consistent.[17]

Table 6. The SAFE Scale test-retest reliability results (n=346)				
Measurements	$\bar{\chi}$	**SD**	**r**	**p-value**
First measurement	88.1	3.1	0.575	p<0.001
Last measurement	89.0	4.2		

r: correlation coefficient, $p<0.05$ level of significance, SD: standard deviation, n: number.

Compared to available tools that study falls risk groups from the point of care personnel, the SAFE scale has a fully patient-centered view. Additionally, the 21-item SAFE scale is concise, easy to complete and needs a simple interpretation by the care personnel and thus it could be adopted smoothly adopted in clinical care. Moreover, just by evaluating the items that constantly have a low score, it is possible to offer specific interventions and education to prevent falls in the elderly patients. Combining the SAFE scale which was developed against falls risks with current tools may assist the elderly to comprehend the factors that cause them to fall and raise awareness of the risks, determine risk groups not aware of the risks and prevent the increase in falls in the elderly patients.

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MAIN POINTS

- SAFE Scale Turkish version is a valid and reliable measurement scale for evaluating Awareness of activity safety and environment, Awareness of physical functions, Awareness of

medication, Awareness of cognitive behavior while elderly patients perform their daily living activities at home or during hospitalization.

- SAFE Scale Turkish version measures the extent to which elderly patients are perceived to meet their needs in the evaluation of Awareness of activity safety and environment, Awareness of physical functions, Awareness of medication, Awareness of cognitive behavior while performing their daily living activities at home or during hospitalization.
- SAFE Scale Turkish version provides a way for elderly patients to understand whether their needs are met in the evaluation of Awareness of activity safety and environment, Awareness of physical functions, Awareness of medication, Awareness of cognitive behavior while performing their daily living activities at home or during hospitalization.

ETHICS

Ethics Committee Approval: Ethics committee approval was obtained from Muğla Sıtkı Koçman University University Human Research Ethics Committee on 07.02.2019 (protocol no: 190023/ decision no: 23).

Informed Consent: The purpose of the study was explained to the elderly individuals and their relatives, and their verbal consent was obtained.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: F.B., Design: F.B., S.K., Supervision: F.B., Resources: F.B., S.K., Data Collection and/or Processing: F.B., S.K., Analysis and/ or Interpretation: F.B., S.K.; Literature Search: F.B., S.K., N.B.U., Writing: F.B., Critical Review: F.B., N.B.U.

DISCLOSURES

Conflict of Interest: The authors declare no conflict of interest.

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