Adaptation to Turkish of the Self-Care of Heart Failure Index: A Validity and Reliability Study

Füsun Afşar[1](İD), Serpil Kayalı[2](İD), Vildan Kesgin[2](İD), Taylan Akgün[2](İD), Habip Yılmaz[3](İD)

[1] Clinic of Cardiology, Dr. Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, İstanbul, Türkiye
[2] Clinic of Cardiology, Başakşehir Çam and Sakura City Hospital, İstanbul, Türkiye
[3] Public Hospitals 1st District, İstanbul Provincial Health Department, İstanbul, Türkiye

ABSTRACT

Introduction: Heart failure is a chronic and progressive disease with increasing prevalence and incidence worldwide, despite advances in science and technology, and it necessitates long-term follow-up, treatment, and care. Self-care in heart failure is one of the fundamental elements of quality of life and disability-free living. The aim of this study was to assess the validity and reliability of the Turkish version of the Self-Care of Heart Failure Index v.2 (SCHFI).

Patients and Methods: The study sample included 233 patients who presented with a diagnosis of heart failure and volunteered to participate in the research at a training and research hospital. The data were collected using a personal information form and the SCHFI. The SCHFI was translated into Turkish, and the internal consistency coefficient and the item-total points reliability coefficient were analyzed for the reliability study. To determine structure validity, Explanatory Factor Analysis and Confirmatory Factor Analysis were performed.

Results: The adaptation of the SCHFI to Turkish culture was found to have high structure validity and internal consistency in the reliability and validity studies.

Conclusion: We concluded that the Self-Care of Heart Failure Index can be used as a unidimensional scale.

Key Words: Selfcare; heart failure; validity; reliability

Kalp Yetmezliği Özbakım İndeksinin Türkçe Uyarlaması: Geçerlilik ve Güvenilirlik Çalışması

ÖZET

Giriş: Gelişen bilim ve teknolojiye rağmen tüm dünyada artan prevalans ve insidansı ile birlikte, kalp yetmezliği kronik, ilerleyici özelliğe sahip, uzun yıllar takip, tedavi ve bakım gerektiren bir hastalıktır. Kalp yetmezliğinde özbakım yaşam kalitesinin ve engelsiz yaşam sürecinin en temel konularından biridir. Bu çalışmanın amacı Kalp Yetmezliği Özbakım İndeksinin (SCHFI) Türkçe geçerlilik ve güvenirlik çalışmasının yapılmasıdır.

Hastalar ve Yöntem: Araştırmaya gönüllü olarak katılmayı kabul eden bir eğitim araştırma hastanesine kalp yetmezliği tanısı ile başvuran 233 hasta, çalışmanın örneklemini oluşturmaktadır. Veriler, kişisel bilgi formu ile SCHFI kullanılarak toplanmıştır. SCHFI'nın dil uyarlaması yapılmış olup güvenilirlik çalışması için iç tutarlılık, madde-toplam puan güvenilirlik katsayısı; yapı geçerliliğini ortaya koymaya yönelik Açıklayıcı Faktör Analizi (AFA) ve Doğrulayıcı Faktör Analizi (DFA) analiz yapılmıştır.

Bulgular: Türkçe Kalp Yetmezliği Özbakım İndeksinin kültürler arası adaptasyonunun, geçerlilik ve güvenilirlik çalışmasında yapı geçerliliğinin ve iç tutarlılığının yüksek olduğu saptanmıştır.

Sonuç: Kalp Yetmezliği Özbakım İndeksinin tek boyutlu bir ölçek olarak kullanılabileceği sonucuna varılmıştır.

Anahtar Kelimeler: Özbakım; kalp yetmezliği; geçerlilik; güvenilirlik

INTRODUCTION

Despite continuing scientific and technological developments in the field of healthcare, heart failure has increasing prevalence and incidence throughout the world and remains one of the most important causes of morbidity and mortality. According to American Heart Association data from 2015, there were approximately 6.2 million heart failure patients aged >20 years in the United States, and with 870.000 new diagnoses per year added, the rate of

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Correspondence

Füsun Afşar

E-mail: fusun.af@gmail.com
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diagnosed cases is expected to rise by 46 percent by 2030[1,2]. According to the HAPPY study, heart failure prevalence in Türkiye is 6.9% and there are 2.000.424 adult heart failure patients[3]. As heart failure is a chronic and progressive disease, it requires many years of follow-up, treatment, and care.

The primary aims of heart failure treatment are to reduce mortality and hospital admissions, increase functional capacity, correct symptoms and findings, and improve quality of life. In addition to medical treatment for patients with heart failure, it is necessary to record and strengthen self-care practices to ensure compliance with recommendations related to the management of signs and symptoms that cause mild to severe impairments in daily life due to fatigue, shortness of breath, and other cardiac findings[4]. Heart failure self-care is defined as the process of healthcare and disease management in which stability is preserved in decisions and behaviors, changes in the patient's condition are identified, and correct practices are provided[5,6].

The scales related to Self-Care Behaviours of Patients with Chronic Heart Failure in Türkiye include the "Self-Care Behaviours of Patients with Chronic Heart Failure Evaluation Scale" of 39 items, developed by Durademir in 1998, and the "European Heart Failure Self-Care Behaviour Scale" developed by Jaarasma et al. in 2003, with 12 items, which was then adapted to Turkish by Baydemir et al. in 2013[7-9].

Studies conducted in the field of heart failure have revealed the need to determine the levels which can be attained in healthy living behaviour, follow-up and management of symptoms, treatment adherence, and patient responsibility[10].

The Heart Failure Self-Care and the Self-Care of Heart Failure Indexes are among the most widely used tools worldwide[11,12]. The Self-Care of Heart Failure Index (SCHFI) has been translated into 22 languages, and over the years has been modified several times in accordance with evidence-based practices[12]. The SCHFI version 7.2 comprises 39 items in four dimensions: self-care (10 items), symptom perception (11 items), self-care management (8 items), and self-belief (10 items)[13].

The aim of this study was to assess the validity and reliability of the Turkish version of the SCHFI v. 2.

PATIENTS and METHODS

Study Universe- Sample

The recommended sample size for a scale to be adapted to a different culture is 5-10 times the number of items in the scale[14]. Thus, the minimum sample size required for the validity and reliability study of the SCHFI-2, which contains 39 items, was 195 individuals. The sample group of volunteers for this research included 233 patients who presented at a training and research hospital with a diagnosis of heart failure.

Data Collection

The first dimension was used to collect general information such as age, gender, marital status, children, educational level, occupation, current employment status, economic status, and people living in the same home. The second dimension was used as the Turkish version of the SCHFI, which consisted of four dimensions: self-care (10 items), symptom perception (8 items), self-care management (11 items), and self-belief (10 items).

Language Validity of the Scale

The Turkish translation of the SCHFI (version 2) was done by three specialists fluent in both Turkish and English. Two of them were healthcare professionals, and one was a linguist who did not work in the healthcare field. The translated scales were collated and examined by another linguist for language compatibility. A language specialist back-translated the revised form into English, which was then compared for compatibility with the SCHFI-2, and the translation to Turkish was completed[15,16].

Ethical Statement

The study was carried out with the permission of the Health Sciences Hospital Clinical Research Ethics Committee (Decision No: KAEK/2022.07.230). All procedures were carried out in accordance with the ethical rules and the principles of the Declaration of Helsinki.

Statistical Analysis

Data obtained in the analyses were evaluated using IBM SPSS (Statistical Package for Social Sciences) and 20 LISREL software. Descriptive statistics were calculated for all the variables and stated as number (n), percentage (%), mean ± standard deviation (SD) values, skewness, and kurtosis. To evaluate the knowledge of data factors, the Kaiser-Meyer-Olkin (KMO) test, sample sufficiency measurement, and the Bartlett sphericity test were used. Significance of the Bartlett sphericity test ($p< 0.000$) and $1.00\leq KMO\leq 0.90$ showed that there was a sufficient sample to support factor analysis. To determine the structural validity of the scale, Exploratory Factor Analysis (EFA) and then Confirmatory Factor Analysis (CFA) were performed. Internal consistency coefficients (Cronbach alpha) were calculated to examine reliability.

RESULTS

The sociodemographic characteristics of heart failure patients are shown in Table 1.

Table 1. Sociodemographic characteristics of heart failure

Age (years)	57.59 ± 15.56		
Time Since Diagnosis (month)	57.25 ± 76.67		
Gender	Female	**73**	**31.3**
	Male	**160**	**63.7**
Marital status	Married	173	74.2
	Single	32	13.7
	Divorced/Widowed	28	12.0
Children	Yes	171	73.4
	No	62	26.6
Education level	Literate	40	17.2
	Primary school	109	46.8
	High school	57	24.5
	University	27	11.6
Occupation	Housewife	87	37.3
	Retired	43	18.4
	Self-employed	12	5.2
	Clerk	9	3.9
	Student	5	2.1
	Manual worker	75	32.2
Economic status	Poor	2	.9
	Middle-income	44	18.9
	High	162	69.5
Current employment status	Employed	27	11.6
	Unemployed	65	27.9
Social insurance	Present	168	72.1
	Absent	211	90.6
Other people with whom currently living	Living alone	22	9.4
	Living with family		

63.7% of the participants were males and 36.3% were female, with a mean age of 57.59 ± 15.56 years. 74.2% were married, 73.4% had children, 46.8% were primary school graduates, 37.3% were retired, 69.5% had middle income, 72.1% were unemployed, and 90.6% lived together with family. The mean time since diagnosis was 57.25 ± 76.67 months.

In the descriptive analysis of the scale, the skewness and kurtosis values were between -3 and +3, showing normal distribution (Table 2).

Kaiser-Meyer-Olkin (KMO) test was performed to determine whether the sample size was suitable for Exploratory Factor Analysis (EFA). To determine whether or not the data were suitable for Exploratory Factor Analysis (EFA), Bartlett tests were performed (Table 3).

The KMO value was 0.95 and the result of the Bartlett test was significant (x^2= 6.327.631; p= 0.000). For EFA, confirmatory factor analysis was performed with a single factor explaining more than 5% variance according to the explained total variance table and the returned components matrix (Table 4, Table 5). The results showed that the dataset was suitable for EFA. A Scree Plot was obtained as a result of the EFA (Figure 1).

The graph shows that the scale has a single dimension. The single-factor cumulative values in the EFA were found to be >40%, determining a 46.7% variance.

Table 2. Descriptive statistic of the self care of heart failure index

Self-Care of Heart Failure Index	Mean	(±) SD	Skewness	Kurtosis
Try to avoid getting sick (e.g., wash your hands)?	4.0300	.83766	-1.033	1.802
Get some exercise (e.g., take a brisk walk, use the stairs)?	4.0687	1.04407	-1.032	.434
Eat a low salt diet?	3.9828	.97364	-.729	-.180
See your healthcare provider for routine health care?	4.1373	.99915	-.881	-.178
Take prescribed medicines without missing a dose?	4.2790	.84299	-.828	-.378
Order low-salt items when eating out?	4.0000	.98261	-.962	.700
Make sure to get a flu shot annually?	3.8798	1.17561	-.840	-.230
Ask for low-salt foods when visiting family and friends?	4.0215	1.07257	-1.015	.420
Use a system or method to help you remember to take your medicines?	4.0129	1.09261	-1.086	.665
Ask your healthcare provider about your medicines?	4.2618	.91215	-.955	-.029
Monitor your weight daily?	3.9614	.82172	-1.245	2.889
Pay attention to changes in how you feel?	4.2275	.73386	-.847	1.165
Look for medication side-effects?	4.1116	.90282	-1.002	.726
Notice whether you tire more than usual doing normal activities?	4.2790	.88782	-1.100	.377
Ask your healthcare provider how you are doing?	4.2060	.87126	-.847	-.130
Monitor closely for symptoms?	4.2446	.84857	-.875	-.066
Check your ankles for swelling?	4.2361	.90976	-1.040	.358
Check for shortness of breath with activities such as bathing and dressing?	3.9657	.64235	-.855	2.681
Keep a record of symptoms?	3.8884	.94936	-1.055	1.315
How quickly did you recognize that you had symptoms?	3.5923	1.05509	-.701	.131
How quickly did you know that the symptom was due to heart failure?	3.6996	1.06060	-.752	.060
Further limit the salt you eat that day?	3.9614	.82172	-.962	1.779
Reduce your fluid intake?	3.8541	.88337	-.580	.107
Take a medicine?	3.9785	.90709	-.726	.331
Call your healthcare provider for guidance?	4.0601	.97636	-.962	.595
Ask a family member or friend for advice?	3.9700	.97995	-.937	.786
Try to figure out why you have symptoms?	4.1373	.89444	-.711	-.432
Limit your activity until you feel better?	4.0730	.93255	-.629	-.637
Did the treatment you take make you feel better?	4.1116	.70435	-.832	1.835
Keep yourself stable and free of symptoms?	4.0687	.71589	-1.026	2.761
Follow the treatment plan you have been given?	4.2103	.72128	-.618	.088
Persist in following the treatment plan even when difficult?	4.1974	.86831	-.833	-.131
Monitor your condition routinely?	4.2747	.90120	-1.105	.340
Persist in routinely monitoring your condition even when difficult?	4.2790	.83786	-1.008	.333
Recognize changes in your health if they occur?	4.2318	.82390	-.967	.473
Evaluate the importance of your symptoms?	4.2489	.83450	-.855	-.077
Do something to relieve your symptoms?	4.2747	.86707	-1.044	.308
Persist in finding a remedy for your symptoms even when difficult?	4.3262	.85402	-1.100	.362
Evaluate how well a remedy works?	4.3305	.89912	-1.168	.355

Table 3. Suitability of the sample for factor analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		**.954**
Bartlett's Test of Sphericity	Approx. Chi-Square	6327.631
	Df	741
	Sig.	.000

Table 4. Factor structure of the SCHFI

SCHFI	Factor 1	Item Total Correlation
Item 1	.579	.555
Item 2	.707	.696
Item 3	.760	.743
Item 4	.766	.747
Item 5	.708	.679
Item 6	.618	.604
Item 7	.534	.524
Item 8	.699	.692
Item 9	.568	.561
Item 10	.749	.735
Item 11	.515	.506
Item 12	.654	.626
Item 13	.743	.717
Item 14	.774	.752
Item 15	.715	.693
Item 16	.731	.703
Item 17	.768	.748
Item 18	.623	.596
Item 19	.569	.557
Item 20	.747	.735
Item 21	.666	.650
Item 22	.568	.548
Item 23	.466	.446
Item 24	.687	.662
Item 25	.660	.638
Item 26	.558	.549
Item 27	.705	.680
Item 28	.723	.698
Item 29	.642	.615
Item 30	.622	.603
Item 31	.710	.683
Item 32	.746	.716
Item 33	.718	.686
Item 34	.774	.748
Item 35	.701	.669
Item 36	.699	.671
Item 37	.749	.723
Item 38	.738	.712
Item 39	.841	.821
Variance Source		18.27
Explained Variance		46.7%

SCHFI: Self care of heart failure index.

The SCHFI had a single dimension, which seemed to explain 46.7% of the total variance. The factor load values of the items collected under the single dimension varied between 0.46 and 0.84 (Table 6).

To confirm the unidimensional structure obtained with EFA, Confirmatory Factor Analysis (CFA) was performed with the LISREL software (Figure 2).

The scale items were assigned t values. In accordance with the analyses performed, the level representing the implicit variable of all the items (observed oblique) of all the factors was significant at 0.05.

The goodness of fit index (GFI) values of the CFA were Chi-square (x^2) 1640.27, Degree of Freedom (df) 691, x^2/df 2.37, and Root Mean Square Error of Approximation (RMSEA) 0.007. The Normalized Fit Index (NFI)= 0.96, Non-Normalized Fit Index (NNFI)= 0.97, and GFI= 0.73 (Table 7). The values of the defined fitness indices were above the acceptable values, and the first-level CFA model of the SCHFI generally showed a good fit.

Reliability

When the reliability coefficients of the SCHFI, which consisted of 39 items, were examined, it was discovered that the reliability coefficient was 0.969 and the sub-dimension reliability coefficients ranged between 0.843 and 0.930. According to these findings, the internal consistency of this scale is high (Table 8).

DISCUSSION

Self-care and disease management for patients with heart failure generally include the administration of multiple medications, adherence to recommended diet and fluid restrictions, daily exercise, daily monitoring of symptoms and weight, and managing changes in symptoms. In the literature, self-care in heart failure patients is defined as behaviors to protect and maintain health, with a focus on self-care, symptom observation and management, and treatment adherence[17,18].

Previous research on heart failure patients conducted using self-care behavior scales has demonstrated the importance of evaluating factors and behaviors affecting self-care in the development of support mechanisms[19,20].

Table 5. CFA fit indices of the SCHFI

Fitness measurements	Good fit	Acceptable fit	Measurement value	Fit
$X^{2/df}$	$0 \leq \chi^2/df \leq 2$	$2 \leq \chi^2/df \leq 3$	2.37	Acceptable fit
RMSEA	0≤ RMSEA≤ 0.05	0.05≤ RMSEA≤ 0	0.077	Acceptable fit
NFI	0.95≤ NFI≤ 1.00	0.90≤ NFI≤ 0.95	0.96	Good fit
NNFI	0.97≤ NNFI≤ 1.00	0.95≤ NNFI≤ 0.97	0.97	Good fit
CFI	0.97≤ CFI≤ 1.00	0.95≤ NNFI≤ 0.97	0.98	Good fit
GFI	0.95≤ GFI≤ 1.00	0.90≤ GFI≤ 0.95	0.73	Poor fit
AGFI	0.90≤ AGFI≤ 1.00	0.85≤ AGFI≤ 0.90	0.70	Poor fit

SCHFI: Self-care of heart failure index, CFA:Confirmatory factor analysis, RMSEA:Root mean square error of approximation, NF: Normalised fit index, NNFI: Non-normalised fit index, CFI: Comparative fit index, GFI: Goodness of fit index, AGFI: Adjusted goodness of fit index.

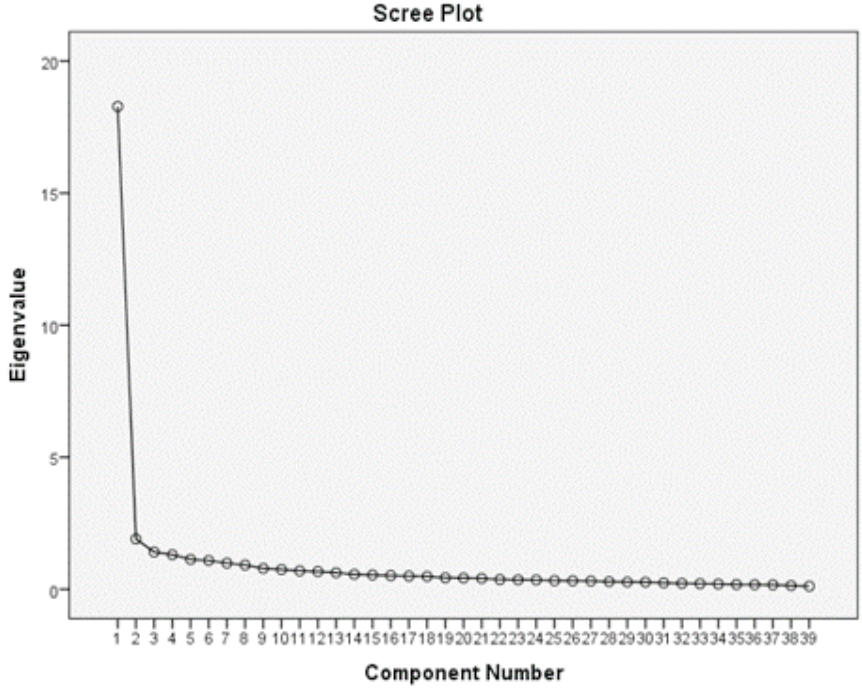

Figure 1. Exploratory factor analysis screeplot.

Table 6. Explained total variance and returned components matrix

	Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %
1	18.278	46.867	46.867
2	1.906	4.886	51.753
3	1.413	3.622	55.375
4	1.309	3.355	58.730
5	1.133	2.905	61.635

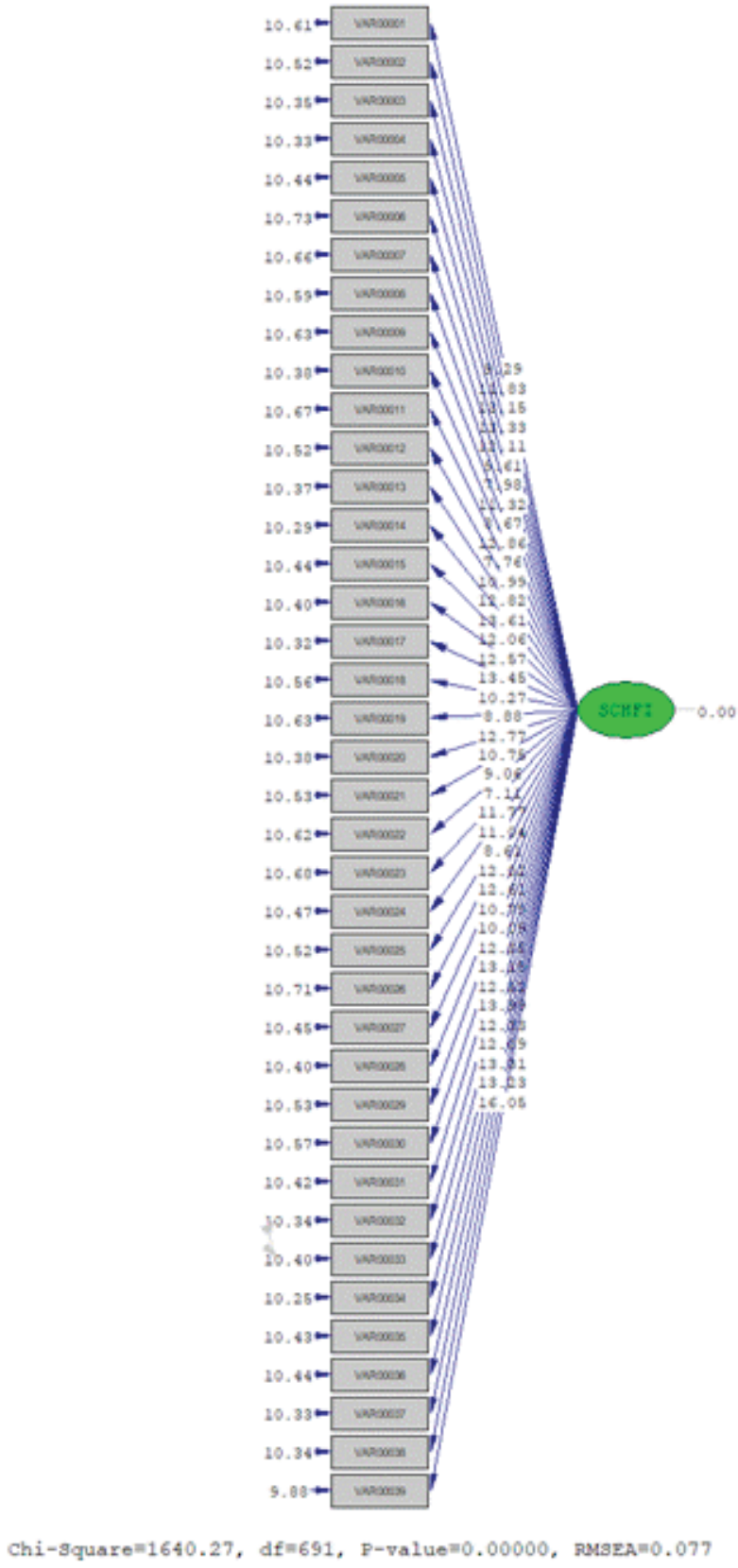

Figure 2. Confirmatory factor analysis model of the self-care of heart failure index.

Table 7. Rotated component matrix

	1	2	3	4	5
VAR00032	.657	.329			
VAR00022	.653				
VAR00033	.639	.353			
VAR00036	.635				
VAR00034	.627	.364			
VAR00035	.593			.301	
VAR00039	.593	.312		.409	
VAR00038	.559			.412	
VAR00030	.557				
VAR00028	.531	.419			
VAR00023	.518				
VAR00037	.499	.335			
VAR00031	.479	.363			
VAR00013	.422	.306		.378	
VAR00015	.709				
VAR00005	.696		.331		
VAR00016		.684			
VAR00004	.629		.397		
VAR00010		.622	.306		
VAR00017	.572				.441
VAR00027	.533	.427			
VAR00014	.321	.441			
VAR00012	.473				.369
VAR00006	.765				
VAR00003		.398	.599		
VAR00002	.597		.305		
VAR00008	.595				.478
VAR00001			.375	.575	
VAR00018	.554	.398			.379
VAR00024	.349	.331		.539	
VAR00029	.465			.343	
VAR00011	.732				
VAR00007					.547
VAR00021	.422				.542
VAR00020	.483				.367
VAR00026	.305				
VAR00009			.417		
VAR00019		.321			.458
VAR00025	.455	.328			

Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalization.

Table 8. Reliability coefficients of the SCHFI

	Cronbach Alpha	Item Number
Total Scale	0.969	39

SCHFI: Self-care of heart failure index.

When the items in the SCHFI version 7.2 are examined, self-care in heart failure can be evaluated in many aspects using the items related to disease prevention[1,7], diet compliance[3,5,6,8,22], exercise[2], fatigue[14], symptom follow-up[11,16-18,20], psychological compliance[12], treatment compliance[4,5,9-11,13,15,19,23], and taking responsibility[21].

The structure validity and internal consistency were found to be high in this study of the validity and reliability of the Turkish version of the SCHFI version 7.2, which had not previously been validated in Turkish and was revised in accordance with current data in 2019, and evaluates the self-care of heart failure patients in many aspects, as shown in previous studies, but unlike other studies, it was concluded that this could be used as a unidimensional scale[21-23].

Ethics Committee Approval: This study was approved by Başakşehir Çam ve Sakura City Hospital Clinical Research Ethics Committee (Decision no: 230, Date: 06.07.2022).

Informed Consent: This is retrospective study, we could not obtain written informed consent from the participants.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept/Design - FA; Analysis/Interpretation - FA; Data Collection - SK, VK; Writing - FA; Critical Revision - FA, HY; Final Approval - TA, HY; Statistical Analysis - FA; Overall Responsibility - FA.

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