Original Article

HEALTH SCIENCES
MEDICINE

DOI: 10.32322/jhsm.1147349
J Health Sci Med 2022; 5(5): 1437-1442

The adaptation to Turkish of the caregiver contributions to selfcare of heart failure index: a validity and reliability study

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Cite this article as: Afşar F, Kayalı S, Kesgin V, Akgün T. The adaptation to Turkish of the caregiver contributions to selfcare of heart failure index: a validity and reliability study. J Health Sci Med 2022; 5(5): 1437-1442.

ABSTRACT

Objective: Although heart failure is a chronic and progressive disease, it is also a disease that requires the patient and caregivers who are not healthcare professionals to spend many years together in the process of follow-up, treatment, and care. Correct evaluation of the patient and caregiver in this process is one of the most important points that will guide the process. The aim of this study was to conduct a validity and reliability study of the Turkish version of the Caregiver Contributions to Self-Care of Heart Failure Index v.2- (CC-SCHFI) and to determine the contributions of caregivers of patients with heart failure.

Material and Method: The study sample was formed of the caregivers of patients who presented at a training and research hospital with a diagnosis of heart failure, who voluntarily agreed to participate in the research. Data were collected using a Personal Information Form and the CC-SCHFI. For the reliability study of the language adaptation of the CC-SCHFI, the internal consistency coefficient and the item-total points reliability coefficient were used, and to determine structure validity, Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were applied.

Results: The cultural adaptation to Turkish of the CC-SCHFI was found to be high. In the validity and reliability study, the structure validity and internal consistency were high and it was concluded that the scale could be used under the sub-dimension headings of "Recommendations for Protection", "The Role of the Caregiver in Treatment Compliance", and "Caregiver Practices".

Keywords: Caregiver, selfcare, heart failure, validity, reliability

INTRODUCTION

Despite continuous developments in science and technology in the field of healthcare, heart failure is one of the most important causes of morbidity and high mortality with an increasing prevalence and incidence worldwide. According to the 2015 data of the American Heart Association, there were approximately 6.2 million heart failure (HF) patients aged >20 years in the USA, and when 870,00 new diagnoses per year are added, it is estimated that the rate of diagnosed cases will increase by 46% by the year 2030 (1,2). According to the HAPPY study, HF prevalence in Turkey is 6.9% and there are 2,000,424 adult HF 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 HF treatment are to reduce mortality and hospital admissions, increase functional capacity, correct symptoms and findings, and improve quality of life. In addition to the medical treatment of patients with HF, to provide compliance with the recommendations related to the management of signs and symptoms which cause mild -severe impairments in daily life because of fatigue, shortness of breath, and other cardiac findings, it is necessary to record and strengthen self-care practices (4). Heart failure self-care is defined as the process of health care 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).

In the management processes of diseases, patients with HF are usually supported by their spouse, family members, or friends. Caregiver is defined in literature as a person supporting the self-care of the patient in the management of the disease but they are also important in many other respects such as preventing symptoms, observations, keeping records, and treatment compliance (6). The presence of caregivers is associated with a positive prognosis and less use of hospital services (7,8).

Clinicians have always needed valid and reliable measurement tools to be able to develop and support self-care, and studies have been conducted in this field. One of the most widely used tools throughout the world is the

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Received: 27.07.2022 **Accepted:** 10.08.2022

Caregiver Contributions to Self Care of Heart Failure Index (CC-SCHFI). Version 7.2 of the CC-SCHFI is formed of 3 sections of self-care (10 items), self-care management (8 items), and symptom perception (11 items) (9).

The aim of this study was to conduct a validity and reliability study of the Turkish version of the Caregiver Contributions to Self-Care of Heart Failure Index v.2- CC-SCHFI and to determine the contributions of caregivers of patients with heart failure.

MATERIAL AND METHOD

The study was carried out with the permission of İstanbul Başakşehir Çam and Sakura City Hospital Clinical Researchs Ethics Committee (Date: 07.07.2022, 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.

Universe-Sample

The recommended sample size for a scale to be adapted to a different culture is in the range of 5-10-fold more than the number of items in the scale (10). Thus the minimum sample size required for the validity and reliability study of the CC-SCHFI-2, which is formed of 29 items, was calculated to be 145 individuals. The sample group of volunteeers for this research was formed of 246 caregivers of patients who presented at a training and research hospital with a diagnosis of heart failure.

Data Collection

The first section was applied as a sociodemographic information form to elicit general information of age, gender, marital status, children, educational level, occupation, current employment status, economic status, and people living in the same home. The second section was applied as the Turkish version of the CC-SCHFI, formed of the 3 sections of 1) HF Self-Care Recommendations (10 items), 2) Symptom Management (11 items), and 3) Care Practices (8 items).

Language Validity of the Scale

The Turkish translation of the CC-SCHFI (version 2) was made by 3 specialists proficient in both Turkish and English languages. Two of these 3 specialists were healthcare professionals and one was a language specialist not in the field of healthcare. The translated scales were collated and examined in respect of language compatibility by a different language specialist. The corrected form was back-translated into English by a language specialist, then compared in respect of compatibility with the CC-SCHFI-2, and the translation to Turkish was completed (10,12).

Statistical Analysis

Data obtained in the study 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 structure validity of the scale, Explanatory Factor Analysis (EFA) and then Confirmatory Factor Analysis (CFA) were applied. Internal consistency coefficients (Cronbach alpha) were calculated to examine reliability.

RESULTS

The sociodemographic characteristics of the caregivers of the HF patients are shown in **Table 1**. As seen in **Table 1**, the study participants comprised 142 (57.7%) males and 104 (42.3%) females with a mean age of 57 years, 186 (75.6%) were married, 198 (80.5%) had children, 90 (36.6%) had an educational level of primary school, 70 (28.5%) were housewives, 185 (75.2%) had an average economic status, 152 (61.8%) were unemployed, 235 (95.5%) had social insurance, and 224 (91.1%) lived together with family.

Table 1. Sociodemographic characteristics of the caregivers

Age (years)	57.8049±15.09408	
Gender		
Female	104	42.3
Male	142	57.7
Marital status		
Married	186	75.6
Single	42	17.1
Divorced/Widowed	18	7.3
Children		
Yes	198	80.5
No	48	19.5
Education level		
Literate	35	14.2
Primary school	90	36.6
High school	64	26.0
University	57	23.2
Occupation		
Housewife	70	28.5
Retired	62	25.2
Self-employed	65	26.4
Clerk	35	14.2
Student	7	2.8
Manual worker	7	2.8
Economic status		
Poor	27	11.0
Average	185	75.2
Good	34	13.8
Current employment status		
Employed	94	38.2
Unemployed	152	61.8
Social Insurance		
Present	235	95.5
Absent	11	4.5
Other people with whom currently living		
Living alone	22	8.8
Living with family	224	91.1

In the descriptive analysis of the Caregiver Contributions to Self Care of Heart Failure scale, the skewness and kurtosis values were seen to be between -3 and +3, showing normal distribution (**Table 2**).

To be able to determine whether or not the data were suitable for EFA, first the KMO and Bartlett tests were applied. The results of the KMO and Bartlett tests are shown in **Table 3**.

As a result of the analysis, the KMO value of 0.92 and the Bartlett test (x2 =5163.009; p=0.000) were found to be significant. The results obtained showed that the data set was suitable for EFA. A Scree Plot obtained as a result of EFA is shown in **Figure 1**.

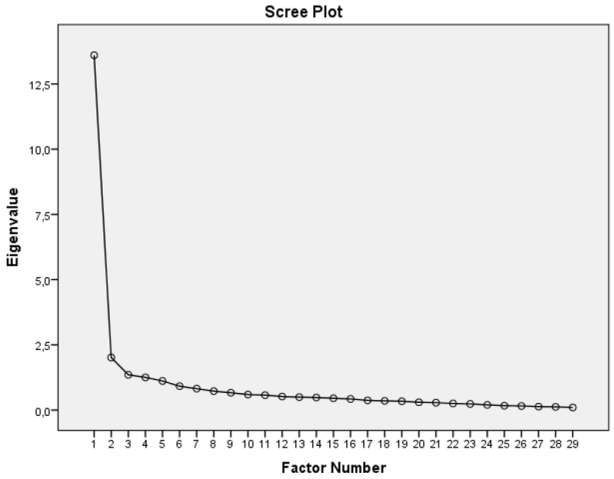

Figure 1. EFA ScreePlot Grafiği

Table 3. Suitability of the sample for factor analysis	
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.928
Bartlett's Test of Sphericity	
Approx. Chi-Square	5163.009
Df	406
Sig.	.000

When the graph is examined, it can be said that the scale has 3 sub-dimensions. The 3-factor cumulative values in the EFA were found to be >40%, with Factor 1 determining 46.90%, Factor 2 determining 6.94%, and Factor 3 determining 5.41% variance. After determining the factor numbers, the common variances and factor loading of the items were determined, and are presented in **Table 4**. When **Table 4** is examined, the CC-SCHFI was seen to be formed of 3 sub-dimensions, which explained 59.25% of the total variance. The factor load values of the items collected under 3 sub-dimensions varied between 0.54 and 0.90, and as the difference between the factor loads was >1, there was not seen to be a need to remove any items.

To be able to confirm the 3-dimensional structure obtained with EFA, CFA was performed with the LISREL program and this is presented in **Figure 2**. The scale items were given 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.

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

The caregiver contributions to self care of heart failure index	**Mean**	**(±) SD**	**Skewness**	**Kurtosis**
1.Try to avoid getting sick (e.g., wash your hands)?	3.9878	1.15522	-1.177	.695
2. Get some exercise (e.g., take a brisk walk, use the stairs)?	3.7236	1.27648	-.763	-.486
3. Eat a low salt diet?	4.0366	1.09297	-1.113	.604
4. See the health care provider for routine health care?	3.9797	1.02797	-.891	.151
5. Take prescribed medicines without missing a dose?	4.1301	1.04557	-.933	-.155
6. Order low salt items when eating out?	3.7886	1.15530	-.620	-.573
7. Make sure to get a flu shot annually?	3.1138	1.51834	-.004	-1.500
8. Ask for low salt foods when visiting family and friends?	4.1138	1.07440	-1.005	.146
9. Use a system or method to help remember to take medicines?	3.9431	1.37203	-1.063	-.160
10. Ask your health care provider about medicines?	4.2154	1.13134	-1.285	.585
11. Monitor weight daily?	3.7114	1.27856	-.804	-.370
12. Pay attention to changes in how he/she feels?	4.0000	.88985	-.911	1.139
13. Look for medicine side-effects?	4.1423	1.08048	-1.109	.405
14. Notice whether he/she tires more than usual doing normal activities?	4.2886	.99490	-1.257	.786
15. Ask the health care provider how he/she is doing?	4.3984	.94967	-1.622	2.051
16. Monitor closely for symptoms?	4.3211	.99310	-1.462	1.391
17. Check ankles for swelling?	4.3699	.95477	-1.566	2.013
18. Check for shortness of breath with activity such as bathing and dressing?	4.1626	1.12394	-1.125	.274
19. Keep a record of symptoms?	3.9268	1.37423	-1.028	-.256
20. How quickly did you recognize that he/she had symptoms?	3.9512	1.05253	-.876	.247
21. How quickly did you know that the symptom was due to heart failure?	2.9146	1.36308	-.039	-1.267
22. Further limit the salt he/she eats that day?	4.1220	1.03479	-1.049	.452
23. Reduce fluid intake?	4.0854	1.07515	-1.085	.495
24. Take a medicine?	3.9106	1.25525	-1.016	.061
25. Call the health care provider for guidance?	4.2967	1.02088	-1.341	.982
26. Ask a family member or friend for advice?	4.1545	1.12146	-1.044	-.089
27. Try to figure out why he/she has symptoms?	3.5854	1.18098	-.813	-.094
28. Suggest that he/she limit activity until he/she feels better?	4.1545	1.12146	-1.044	-.089
29. Did the treatment you used make him/her feel better?	3.5854	1.18098	-.813	-.094

The goodness of fit index (GFI) values of the CFA were found to be Chi-square (x2)914.70, Degree of Freedom (df) 360, x2 / df 2.54, and Root Mean Square Error of Approximation (RMSEA) 0.079. The Normalised Fit Index (NFI)=0.95, Non-Normalised Fit Index (NNFI)=0.96, and GFI=0.64. The values of the defined fitness indexes were seen to be above the acceptable values, and the first level CFA model of the CC-SCHFI was determined to generally show good fit (**Table 5**).

In the CFA of the CC-SCHFI, items 3,4,5,12,14, 15, 16, 17, 20, 21,22, 24,25, 27, 28, and 29 were in Factor 1, and explained 46.90% of variance, and these items were seen to be questions related to caregiver practices. Items 1, 2, 9, 10, 11, 13, 19, and 26 in Factor 2 explained 6.94% of variance, and these items were related to the role of the caregiver in treatment compliance. Items 6,7,8, and 23 in Factor 3 explained 5.41% of variance and were related to patient self-care protection recommended behaviours.

Table 4. Factor structure of the CC-SCHFI

CC-SCHFI	Factor 1	Factor 2	Factor 3	Item Total Correlation
Item 1		.347		.693
Item 2		.592		.519
Item 3	.635		.471	.792
Item 4	.684		.427	.656
Item 5	.616		.476	.644
Item 6	.351		.717	.690
Item 7			.427	.698
Item 8	.357		.557	.653
Item 9		.723		.526
Item 10	.553	.683		.669
Item 11		.744		.746
Item 12	.758			.744
Item 13	.594	.709		.718
Item 14	.713	.344		.621
Item 15	.792			.494
Item 16	.794			.610
Item 17	.746			.673
Item 18	.657	.431		.614
Item 19		.709		.740
Item 20	.743			.688
Item 21	.744	.316		.659
Item 22	.647	.329		.797
Item 23			.328	.690
Item 24	.755			.557
Item 25	.666	.350		.645
Item 26		.657		.797
Item 27	.829			.690
Item 28	.683	.350		.557
Item 29	.673			.645
Variance Source	**Factor 1**	**Factor 2**	**Factor 3**	**Total**
Explained variance	46.90	6.94	5.41	59.25%

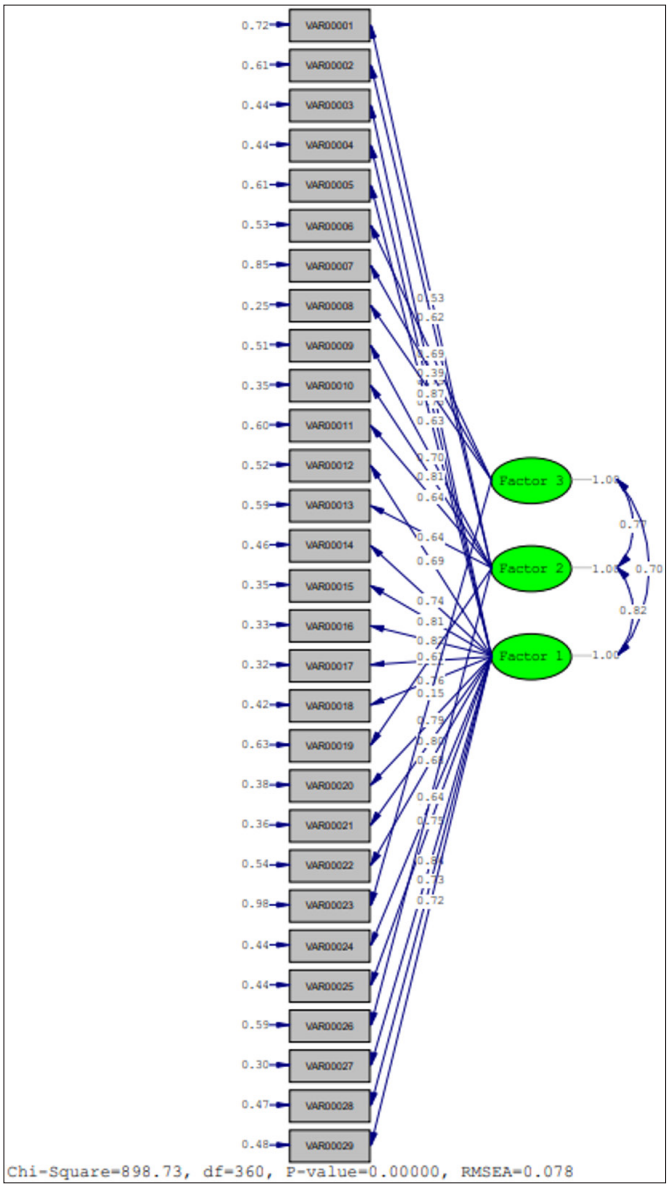

Figure 2. CFA Model of the CC-SCHFI

Table 6. Reliability coefficients of the CC-SCHFI and sub-dimensions

	Cronbach Alpha		Item Number	
Total scale	0.952	0.952	29	29
Recommendation	0.762	0.624	7	4
Symptom management	0.923	0.856	8	8
Carer role	0.916	0.958	14	17

Table 5. CFA Fit Indexes of the CC-SCHFI

Fitness measurements	Good fit	Acceptable fit	Measurement value	Fit
X2/df	0≤χ2 /df≤2	2≤χ2 /df≤3	2.49	Acceptable fit
RMSEA	0≤RMSEA≤0.05	0.05≤RMSEA≤0	0.078	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	0.97	Good fit
GFI	0.95≤GFI≤1.00	0.90≤GFI≤0.95	0.78	Poor fit
AGFI	0.90≤AGFI≤1.00	0.85≤AGFI≤0.90	0.84	Poor fit

Reliability

When the reliability coefficients calculated of the CC-SCHFI, formed of 29 items, are examined in Table 6, the total reliability coefficent was 0.952 and the reliability coefficients of the sub-dimensions varied between 0.762 and 0.923. According to these findings, the internal consistency of this scale is high.

DISCUSSION

Self-care of patients with heart failure and the disease management processes generally include the management of more than one drug, the follow-up of recommended diet and fluid restrictions, the performing of daily exercise, daily monitoring of symptoms and weight, managing changes in symptoms (eg., when taking an extra diuretic or experiencing early fluid overload seeking a healthcare provider for guidance) and navigating the healthcare system. Self-care of HF patients, which is defined in literature as behaviours to protect and maintain health, is focussed on the processes of self-care, observation and management of symptoms and treatment compliance. The management process of HF patients is made together with caregivers who are not professional healthcare workers in the majority of cases (13,14).

In Turkey, the validation of the Turkish version 6.2 of the CC-SCHFI was performed by Akbıyık and Enç (14) in 2016. Validation studies of the CC-SCHFI in Spain and Thailand found a structure of one dimension, whereas the Brazilian version and the current study showed a structure with 3 dimensions, similar to the original (15,17). As in the original study, the analyses showed generally high factor loading in all 3 sub-dimensions of the Turkish version of the CC-SCHFI, and caregiver practices was seen to have the highest factor loading. It is noteworthy that the caregiver practices focus on being aware and preventing the development of symptoms, and managing the process. In recent years, specific scale studies related to the effect of symptom management on both patient and caregiver have shown the importance of symptom management (18,19). Protection, treatment compliance, and symptom management are subjects in the education given to patients and their families by healthcare professionals (20,21).

The ability of healthcare professionals to measure the contribution of both the patient and caregivers to the process of management of HF will be of guidance in the treatment and care process to be able to maintain quality of life and continuity of life without disability. Previous studies have shown that awareness, behaviours, and levels of knowledge are important in the disease management process for caregivers and patients with HF (22,23).

CONCLUSION

The CC-SCHFI evaluates the process in three dimensions and can help caregivers identify deficient areas of self-care for HF patients, and it is an easy-to-manage tool allowing the design of individual plans which aim to expand knowledge to improve skills. In this validity and reliability study of the adaptation between cultures of the CC-SCHFI to Turkish, the structure validity and internal consistency were determined to be high. It was concluded that the scale can be used under the sub-dimension headings of "Recommendations for protection", The Role of the Caregiver in Treatment Compliance", and "Caregiver Practices".

ETHICAL DECLARATIONS

Ethics Committee Approval: The study was carried out with the permission of İstanbul Başakşehir Çam and Sakura City Hospital Clinical Researchs Ethics Committee (Date: 07.07.2022, Decision No: KAEK/2022.07.230).

Informed Consent: All patients signed the free and informed consent form.

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

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