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**Adaptation and Psychometric Testing for Turkish of the Caregiver Competence Scale  
Bakım Verme Yeterliliği Ölçeği'nin Türkçe Uyarlaması ve Psikometrik Olarak Test  
Edilmesi**

Demir Avcı and Gözüm. Caregiving Competence Scale-TR

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**ABSTRACT**

**Objective:** The purpose of this study was to adapt to Turkish and assess the cultural and psychometric properties Caregiving Competence Scale (CCS).

**Methods:** CCS-Turkish form (CCS-TR) was tested in a sample of 337 family caregivers of stroke patients. Explanatory and confirmatory factor analyses were carried out for construct validity. Item-total score correlations, Cronbach's Alpha value, and split-half test were calculated for reliability. The score of the scale was 4-16 points.

**Results:** The mean age of the caregivers was found to be  $47.48 \pm 14.52$  whereas the mean age of the stroke patients was found to be  $70.34 \pm 12.04$ . According to the expert opinion, the content validity index score of the scale (S-CVI) was .83. As a result of the confirmatory factor analysis, it was found that the single factor structure revealed a good fit. It was noted that the Cronbach's Alpha value was .83 whereas the split-half reliability value was  $r: .82$ . The total score of the scale was determined as  $11.5 \pm 1.74$ .

**Conclusion:** Validity and reliability values of the CCS-TR were found to be high in the study. It has revealed that the scale can be used safely. The presence of CCS in different languages provided an advantage for conducting comparative studies.

**Keywords:** Caregiving competence, caregiver, validity and reliability, Turkish

## ÖZ

**Amaç:** Bu çalışmanın amacı Bakım Verme Yeterliliği Ölçeği'nin (BVYÖ) Türkçe'ye uyarlanması ile kültürel ve psikometrik özelliklerinin değerlendirilmesidir.

**Yöntemler:** BVYÖ-Türkçe formu (BVYÖ-TF) inmeli hastalara bakım veren 337 aile üyesinden oluşan bir örnekleme test edildi. Yapı geçerliliği için açıklayıcı ve doğrulayıcı faktör analizi yapılmıştır. Güvenilirlik için, madde-toplam puan korelasyonları, Cronbach Alpha değeri ve iki yarı testi hesaplandı. Ölçek puanı 4-16 puandır.

**Bulgular:** Bakım veren aile üyelerinin yaş ortalamasının  $47.48 \pm 14.52$  ve inmeli hastalarının yaş ortalamasının ise  $70.34 \pm 12.04$  olduğu bulunmuştur. Uzman görüşleri doğrultusunda ölçeğin kapsam geçerlilik indeksi puanı (S-CVI) .83'dir. Doğrulayıcı faktör analizi sonucunda, tek faktörlü yapının iyi bir uyum sağladığı görülmüştür. Cronbach Alpha değeri .83 iken, iki yarı güvenilirlik değerinin  $r: .82$  olduğu belirtilmiştir. Ölçeğin toplam puanı  $11.5 \pm 1.74$  bulunmuştur.

**Sonuç:** Çalışmada BVYÖ-TF'nin geçerlik ve güvenilirlik değerlerinin yüksek olduğu bulunmuştur. Ölçeğin güvenle kullanılabileceği ortaya konulmuştur BVYÖ'nün farklı dillerde mevcut olması karşılaştırmalı çalışmalar yapmak için avantaj sağlamıştır.

**Anahtar Sözcükler:** Bakım verme yeterliliği, bakım veren, geçerlilik ve güvenilirlik, Türkçe

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## Introduction

The members of a family undertake the primary responsibility for long term care of the individuals having stroke. The family members undertaking the care giving responsibility during hospitalization period also continue to contribute in complex care giving processes (1). Home-based healthcare services have rapidly developed in Turkey in recent years. In addition, procedures such as changing the catheter or wound care may be performed at home environment. (2). However, the care is dominantly provided by the families; therefore, families should be competent for care giving. Financial support given to family members and supplying some of the materials required for the patient by state may contribute to the competency of the care givers even if it is not sufficient.

Fulfilling the care required for the individuals who are dependent for daily life activities due to stroke is a long and difficult process. The incidents experienced suddenly and unexpectedly like stroke are difficult to be adopted by the patients and care givers (3). The care givers trying to adopt care giving state to the individual who had stroke experience an intense stress between their own responsibilities and daily life activities. Within this context, acquiring the care giving competency for the family or informal care givers and acceleration as well as support of the adoption to the process are very critical issues (4). The researchers have stated that the negative experiences and care giving burden on the family members undertaking the primary responsibility for care giving to the bedbound individuals may be decreased by support and consultancy (5, 6). Competency of caregiving should be evaluated in order to determine the training requirements of the individuals undertaking the care giving responsibility (3). It is considered that preparation of training events to be provided as a result of caregivers' assessment in a planned manner and through the requirements may be effective to resolve the problems and to meet the requirements (7). Preparations of the family members for care giving process and gaining the skills and competences that may be required are important for effective management of the process (4,7).

Valid, reliable and feasible measurement tools are needed for the determination of competency of the family or informal care givers in terms of patient safety and care surveillance. Scholten et al. (4) has noted in a literature review that 96 measurement tools were used to evaluate the care givers and number of the items in such tools varied between 4 and 37. Less measurement tools were found to measure the competency of family caregiver in Turkey (8-10). Although there are various measurement tools assessing the care givers in the literature, The Caregiving Competence Scale (CCS) has been used in many studies since it included four items, had a single dimension, was easy to understand and available in three different languages. Availability of Caregiving Competence Scale in English (11), Swedish (12) and Chinese (13) versions ease the process of international comparison.

The caregiver's feeling of self-competent affects his/her behavior towards the patient. The caregiver competency scale developed by Pearlin et. al. (11) was used in many studies regarding the evaluation of caregiver competency. The caregiver competency scale was used to measure the levels of caregiving competence perceived by caregivers of patient groups such as patients with stroke, alzheimer, cancer and dementia in the literature (14-17).

In a study measuring the competency of caregivers, six weeks and 90 minutes of group training were applied to the caregivers of alzheimer patients. As the result of the study, it was noted that there was an increase in terms of the competency level of the care givers and it was possible to have educational and group discussions on various issues found difficult by the care-givers (14). In another study, it was stated that psychoeducation given to caregivers increased the competency level and problem-solving abilities of caregivers (15). In a study conducted by Quinn et. al. (16) with caregivers of patients with dementia, it was found that the competency level of the caregivers were low and there was a relationship between life quality and satisfaction and the competency of caregivers.

The purpose of this study was to adapt to Turkish and assess the cultural and psychometric properties Caregiving Competence Scale (CCS). Moreover, the aim is to assess its compatibility with Turkish culture and compare it with the translated versions in other languages.

## **Methods**

### **Design**

This study used a methodological design.. The universe of the present methodological research consisted of all caregivers referring to neurology clinic and stroke polyclinic of an university hospital between December 1, 2017 and February 10, 2018. The sample consisted of 377 caregivers who met the inclusion criteria. In the literature, there are different opinions on sample size related to scale studies. Even though 20 participants are recommended per item, number of adequate sample size is expressed as “50: very poor, 100: poor, 200: fair, 300: good, 500: very good, and 1000: excellent” in order to perform factor analysis (18). Therefore, the sample size of 400 was targeted and the data of 377 participants (participant rate of 94%) agreeing to participate were evaluated. Also, KMO and Bartlett's test is indicated that our sample was enough for factor analysis.

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**Inclusion criteria were as follows;**

- To be primary caregiver of stroke patient
- Dependency level of the patient at 2, 3, 4 according to Modified Rankin Scale (19,20)
- Literate caregiver
- Having no communication problem
- Contribution request of the caregiver to the study

**Data Collection tools;****Caregiving Competence Scale Turkish Form (CCS-TR)**

Pearlin et al. (11) developed the CCS consisting of four questions. The Likert type scale was structured as "not sufficient at all by "1", slightly sufficient by 2, sufficient by 3 and very sufficient by 4. The lowest score was 4 and the highest score was 16. The increase of the score of the scale meant the increase in competency for caregiving (11).

Furthermore, some characteristics of the caregiver and patient such as age, gender, marital status, as well as income level of the family, kinship with the patient, gender and age of the patient, stroke type, dependency grade and other chronic diseases were examined.

**Data Collection Method**

Written consents of the caregivers were obtained in order to conduct the research.

Furthermore, the questionnaires were completed through personal interviews with the caregivers in neurology Clinic and Stroke Polyclinic of the university hospital. The data were collected in the Stroke Polyclinic for one week and in Neurology Clinic when the researcher was available. The questionnaire were filled through face to face interviews of caregivers meeting the inclusion criteria by researcher. The data were collected in an available separate room.

**The Adaptation of the Scale and Its Translation**

The translation process included translation-panel, opinions of the experts, re-translation and pilot implementation. The independent professional translation was performed by 2 independent translators, 1 neurologist, 2 nurses and 1 academician understanding and speaking both languages (Turkish-English). The ten experts' opinion stage of the scale was performed by eight professors from the department of nursing, a nurse from neurology clinic and an instructor from the Department of Foreign Languages. Re-translation was performed by an instructor from Foreign Languages Department through expert opinions.

CCS-TR was tried as a pilot implementation for comprehensibility and caregivers of 30 patients who had stroke. Minor revisions were made to avoid any changes in the meaning after preliminary evaluation. The minor revision was reported to one of the authors, Sample S. J. who developed CCS via e-mail (e-mail date 22.03.2018) and his consent was obtained.

**Data Analysis**

The data was analyzed by SPSS (Statistical Package for Social Science) 23.0 program.

Normality test was performed before statistical analysis. Cronbach Alpha, Split Half Reliability for validity and reliability; Kaiser-Meyer Olkin (KMO) and Barlett test for explanatory factor analysis was done in SPSS program. LISREL 8.71 package program was used for confirmatory factor analysis. Item-total score correlation and Cronbach Alpha and Split Half Reliability were performed for reliability of the scale. Test - re-test method was not appropriate for the scale. Therefore, two half reliability method was implemented. Whether demographic features make a difference in CCS-TR scores, Independent Samples t test in binary groups was analyzed. The One Way ANOVA was used in more than two groups.

**Ethics**

Consent of the author who developed the scale was obtained before initiating the research.

Written consents of Ethical Committee of the University Hospital (01/06/2017-10/07) and of the hospital where the research was carried out were obtained. Informed consent was signed by the caregivers who were volunteered to participate in the study.

## Results

The mean age of the caregivers was found as  $47.48 \pm 14.52$  whereas the mean age of the stroke patients was found as  $70.34 \pm 12.04$ . Among the caregivers, 75.7% (n=255) were female and 60.8% (n=205) were male. Married caregivers consisted of 83.1% of all participants; 49.8% (n=168) of them were elementary school graduates and having lower educational level; 25.2% (n=85) of them were unemployed. Almost half of the patients were parents of the caregivers (47.8%, n=308). Majority of the stroke patients were diagnosed with ischemic stroke (91.4%, n=308). The most common concomitant chronic disease of the stroke patients was found to be hypertension by 40.4% (n=136) (Table 1).

### Content Validity

For content validity, 10 specialists evaluated each item as "not adequate" by 1, slightly adequate by 2, very adequate by 3, and very adequate by 4. Content Validity Index (CVI) of the scale was found .83. CVI values of the items were determined as .07, .06, .08, .09, respectively.

### Construct Validity

Exploratory factor analysis results revealed 66.675% variance of the scale at a single dimension. Variance analysis KMO (Kaiser-Meyer Olkin) = .81 indicated that the sample size was very good and significance of Bartlett test showed that the data was adequate for factor analysis ( $\chi^2 = 491.133$ ;  $p = 0.000$ ). No rotation was performed since the scale had a single factor structure (Figure 1). Excellent compliance of the single factor structure was found as a result of confirmatory factor analysis (RMSEA=.00, NFI=.00, CFI=.00, IFI=.00, RFI=.99, GFI=.00, AGFI=.99) (Table 2, Figure 2).

### Reliability

Corrected item-total correlation values of the scale were .620, .698, .666, .659 (Table 3).

Cronbach Alpha value was found as .83. Value of the two half reliability was  $r = .82$ .

The distribution of the effect of the descriptive characteristics of caregivers on the average score of the care competency scale was presented. It was found that previous experience of caregiving and the level of dependence of the patient had an effect on the competency of the caregiver ( $p < 0.05$ ) (Table 4).

## Discussion

It has been determined that COS adapted to Turkish is linguistically and culturally appropriate. The validity of the content was performed in terms of compliance among specialist opinions after the translation process at language adaptation phase of the measurement tool (19). The grade of comprehensibility of the scale and the qualifications to be measured between the specialists were found similar to Chinese version (12) (CVI=.83). Scope validity values of the four items for I-CVI were 0.07 and 0.09 and they were similar to the values of the Chinese version (13).

The Adaptation of the "Caregiving Competence Scale" developed by Pearlin et al. (11) and adopted into English as well as Chinese and Swedish and into Turkish was found to be valid and reliable. Majority of the participants were female, elementary school graduates and unemployed. Such profile was found to be similar with the profile of being female, having low education level and being unemployed in other countries (10, 13). Validity and reliability of Caregiving Competence Scale in a group indicated that it may be used in a wider population. Caregiving Competence Scale were performed on caregivers of 337 patients with stroke whereas English version was implemented to caregivers of 326 patients with dementia Perlin et al. (11); Swedish and Chinese versions were performed on caregivers of 124 patients with cancer (12) and 118 patients with stroke (20), respectively. Multi-centered studies and comparative analyses may be carried out by conforming the validity and reliability of Caregiving Competence Scale.

The caregivers expressed the caregiving competency perceived in the scale. Two scoring

types were found in the literature. Moreover, it was observed that the original scale score varied between 4 and 16; and 0 and 12 in other scoring type. Average score of the Turkish Form of the caregiving competence scale was found 11.5, Cheng et al. (21) found as 12.5 and Cheng et al. (19) found the score as 12.3. Chan et al. (22) found such score as 11.4 whereas Henriksson et al. (12) detected the score 6 and Henriksson et al. (12) detected the lowest score when compared with other studies. The reason was that scoring was performed according to 0 and 12.

Confirmatory factor analysis results presented excellent compliance. Therefore, there was no need for any modification. (Figure 2). Factor analysis results were found to be similar compared to the results of study of Henriksson et al. (12). Despite the cultural difference, similar results have indicated that the problems of the caregivers are similar. The result has revealed that the need is universal and the caregiving competence perceived by the caregivers should be improved.

The situation to be considered in the evaluation of confirmatory factor analysis is the ratio of chi-Square value to the degree of freedom. Civelek (23) considers this ratio to be below 3 as a sign of perfect harmony. This value was found to be 0.61 in CCS-TR and shows perfect fit. The RMSEA value of the scales with confirmatory factor analysis should be close to or equal to 0, while the GFI and CFI values close to 1 increase the level of compliance. The CFI value of CCS-TR was .00, the GFI value was .00 and the RMSEA value was .00. Considering all these criteria, it can be said that the adaptation study was successful according to the results of the exploratory and confirmatory factor analyzes of the scale (Table 2). This situation was similar with original the CCS (11) and China (12) and Swedish (13) language versions. Factor loads of items under a single factor ranged between .785 and .842. At the same time, the break point was examined on the scree plot, and the scale showed a single factor structure from the break point (Figure 1). CCS-TR explained 66.675% of the variance of the single-factor structure. Orçun (24) stated the requirements of the variance explained in the measuring scale at 52% and over.

Cronbach Alpha has been frequently used to determine internal consistency in scale development studies. Cronbach Alpha level varies between 0 and 1. The lowest score should be .70 and over in scale studies (25). Cronbach Alpha was found .83 and sufficient in the present study. The Cronbach Alpha level in the original scale was .74; Henriksson et al. (12) found the Cronbach Alpha level .86; Cheng et al. (13) detected the Cronbach Alpha level .81. Reliability values of the scale were found close to each other. The Cronbach Alpha value of the present study was determined as higher than the original value. The reason of higher values was the performance of the study in 1990. Improvement of the healthcare system within years; increase of the options associated with the care and educational levels of the individuals may be related to the increased knowledge on competence concept by the caregivers.

In our study, the fact that the caregivers were having previous experience of care and to be moderate disability of stroke patients increased the competency of the caregiver (Table 4). On the other hand, the fact that the patient was moderately dependent increased the competency of the caregiver. In another study conducted with caregivers of stroke patients, the ability of caregivers to deal with problems affected the competency of caregivers (15). In the study of Llanque et.al. (14), it was noted that stress and fun affected the competency of care giving. In the literature, it was found that efforts made for caregivers of patient groups such as stroke, alzheimer, dementia increased the competency of caregivers (14-16) whereas it was found that there was not any increase in terms of competency of caregivers in a randomized controlled study where psychoeducation was applied to caregivers of palliative care patients with cancer (17). This result could be due to the high number of mortality cancer patients, the duration and the content of these efforts.



## Conclusion

The validity and reliability values of the Turkish version of Caregiving Competence Scale were found to be similar compared to English, Swedish, and Chinese versions. Validity and reliability values of the CCS-TR were found to be high and it has revealed it may be used safely. The presence of CCS in different languages provided an advantage for conducting comparative studies whereas the fact that the scale was a short and easy tool provided an advantage for its use in the field by the healthcare professionals.

**Ethics Committee Approval:** Association Declaration of Helsinki “Ethical Principles for Medical Research Involving Human Subjects”, (Protocol no:10/07, Date:01.06.2017).

**Informed Consent:** The caregivers were informed about the study and their written consents were obtained.

**Peer-review:** Externally peer-reviewed.

**Author contributions:** Concept: Y.D.A., S.G.; Design: Y.D.A., S.G.; Data Collection or Processing: Y.D.A., Analysis or Interpretation: Y.D.A., S.G.; Literature Search: Y.D.A., Writing: Y.D.A., S.G.

**Conflict of Interest:** The authors declare that they have no conflicts of interest.

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<b>Table 1. Demographic characteristics of family caregivers and stroke patients (N=337)</b>		
<b>Characteristic</b>	<b>Mean±SD or n (%)</b>	
	<b>Caregivers</b>	<b>Stroke patients</b>
<b>Age (<math>\bar{X} \pm SD</math>)</b>	47.48±14.52	70.34±12.04
<b>Gender</b> Caregiver –Female Stroke patient-Male	255 (75.7)	205 (60.8)
<b>Maritus status</b>		
Married	280 (83.1)	
Single	57 (16.9)	
<b>Educational level</b>		
Primary or less	168 (49.8)	
Secondary	57 (16.9)	
Tertiary or above	112 (33.3)	
<b>Employment status</b>		
(being employed)	85 (25.2)	
<b>Type of stroke</b>		
Ischemic		308 (91.4)
Hemorrhagic		29 (8.6)
<b>Relatives of the family</b>		
Father-Mother		161 (47.8)
Spouse		89 (26.4)
Children		17 (5.0)
Sibling		15 (4.5)
Others		55 (16.3)
<b>Most prevalent health problems</b>		
Hypertension		136 (40.4)
Diabetes		24 (7.0)
Hypertension and diabetes		101 (30.0)
Others		76 (22.6)
<b>Modified Rankin Scale (0-5)</b>		
2(Slight disability)		62 (18.4)
3(Moderate disability)		119 (35.3)
4(Moderately severe		156 (46.3)

disability)		
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**Table 2.** Confirmatory Factor Analysis of CCS-TR

Index of Compliance	Abbreviation	Caregiving Competence Scale	Excellent Compliance Limit*
Degrees of Freedom	Df	2	-
P value	P	0.54	$0.05 \leq p \leq 1$
Chi Square/ Degrees of Freedom	$\chi^2/df$	1.22/2=0.61	should be smaller than $\chi^2/df=3$ or lower
Root Mean Square Error of Approximation	RMSEA	.00	=.000 and <.050
Normed Fit Index	NFI	.00	.95 and over
Comparative Fit Index	CFI	.00	.97 and over
Inceremental Fit Index	IFI	.00	.95 and over
Relative Fit Index	RFI	.99	.95 and over
Goodness of Fit Index	GFI	.00	=.90 and over
Adjusted Goodness of Fit Index	AGFI	.99	=.90 and over

\*Excellent compliance limits were determined according to (25)

**Table 3.** Factor loading, item analysis and item-total correlations for four items in the CCS-TR (N=337)

Caregiving Competence scale item	Factor loading	Item mean (SD)	Corrected item-total correlation	Cronbach's alpha if item deleted
1. How much do you believe that you have learned if you come up with a difficult situation about the caring of your patient?	.842	2.76±0.58	.620	.807
2. How much do you feel that all in all, you're a good caregiver?	.822	2.90±0.50	.698	.769
3. How competent do you feel?	.816	2.84±0.54	.666	.782
4. How self-confident do you feel?	.785	3.04±0.49	.659	.787
Caregiving Competence Scale (X± SD) (min-max, 4-16)		11.5±1.74		

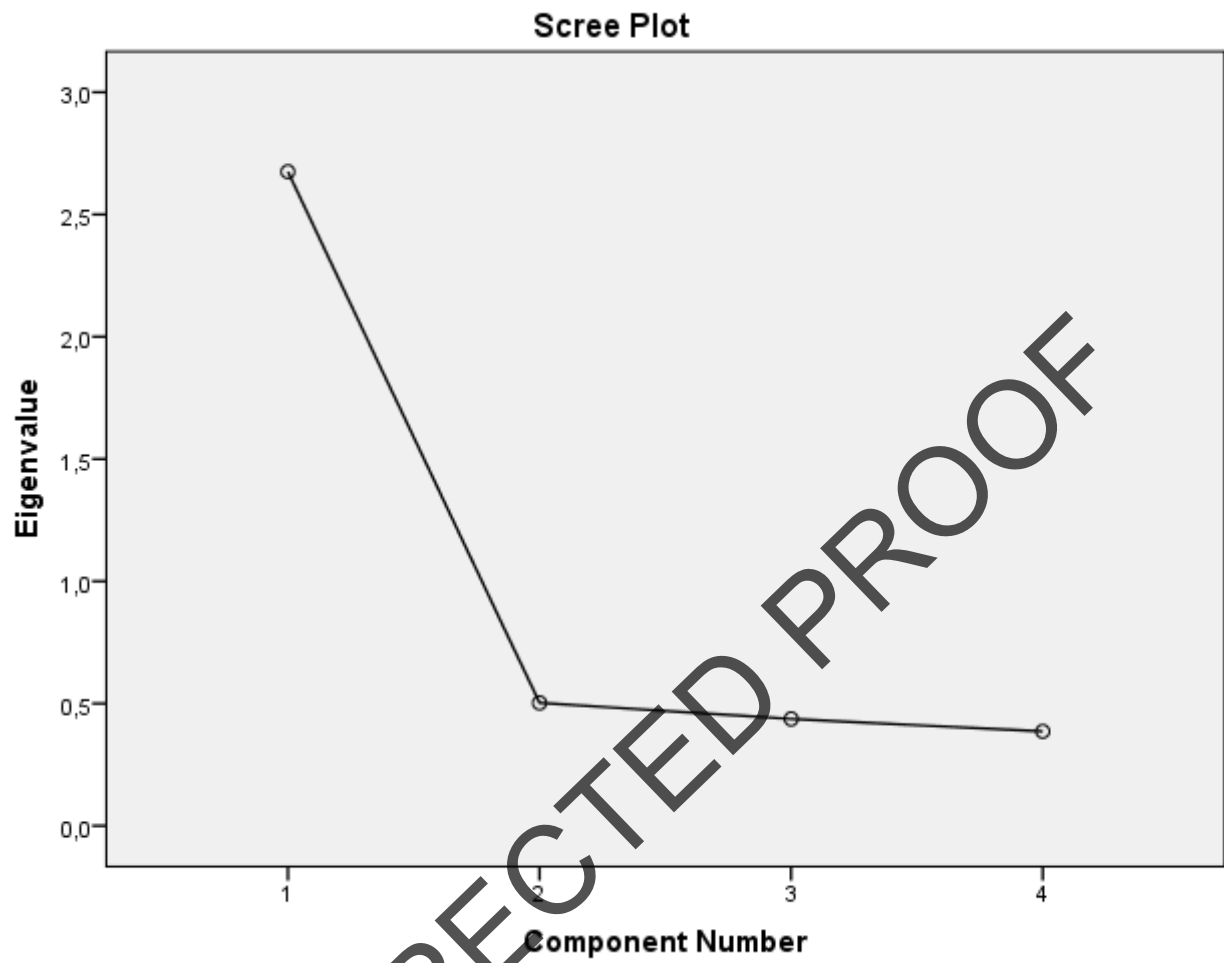
\*Independent Samples t Test  
\*\*One Way ANOVA/ Tukey have used for post hoc analysis

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**Table 4.** The Evaluation of the definitive characteristics of caregivers according to the average score of the CCS-TR

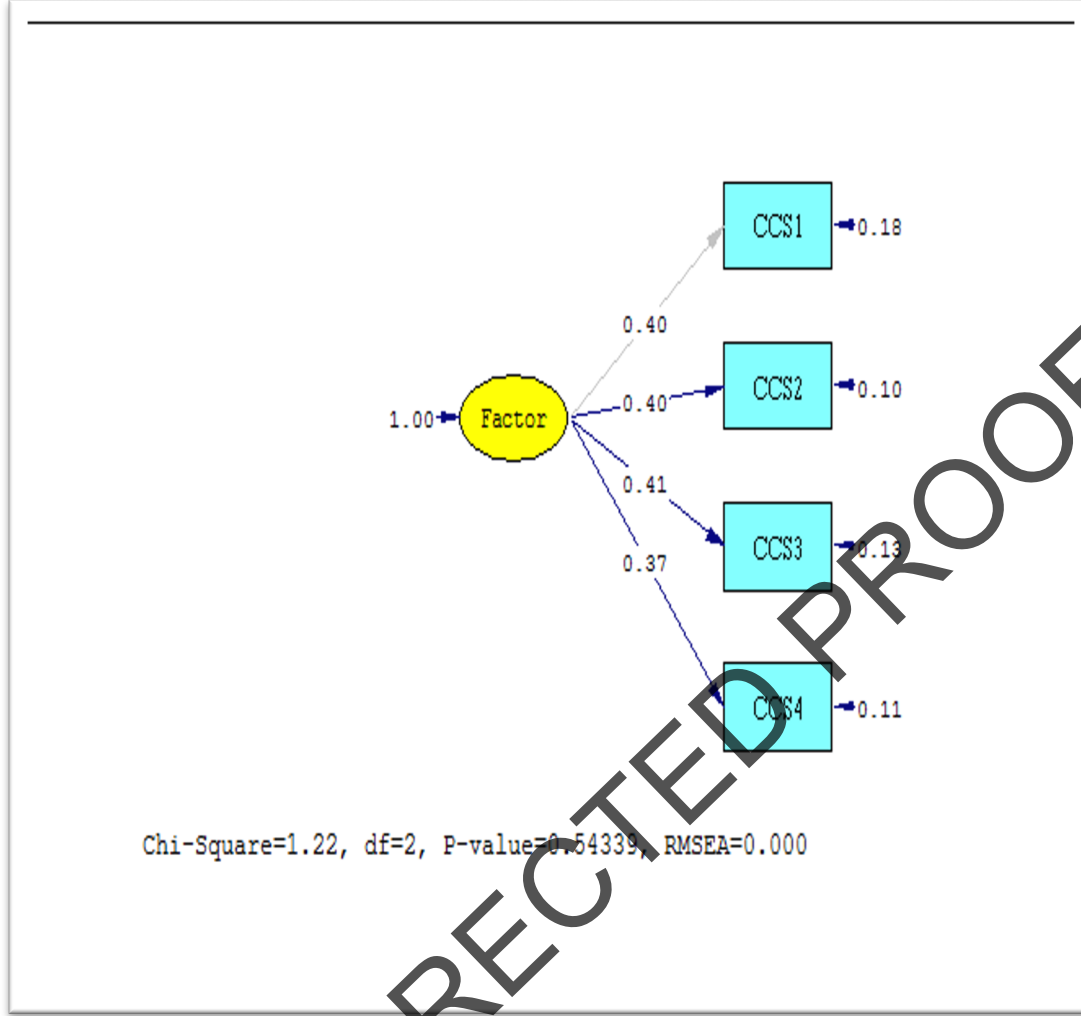
		<b>n</b>	<b>%</b>	<b>Mean</b>	<b>P</b>
<b>Gender</b>	Female	255	75.7	7.65±1.72	>.05
	Male	82	24.3	7.51±1.55	
<b>Type of stroke</b>	Ischemic	308	91.4	7.62±1.62	>.05
	Hemorrhagic	29	8.6	7.58±2.30	
<b>Maritus status</b>	Married	280	83.1	7.52±1.56	>.05
	Single	57	16.9	8.07±2.16	
<b>Previous experience of caregiving for the patients</b>	Yes	80	23.7	<b>8.03±1.70</b>	<.05*
	No	257	76.3	<b>7.48±1.66</b>	
<b>Person providing support in terms of patient care</b>	Available	236	70	7.61±1.69	>.05
	None	101	30	7.63±1.67	
<b>Person receiving care except for the patient</b>	Available	46	13.6	7.78±1.54	>.05
	None	291	86.4	7.59±1.71	
<b>Patients dependence level Modified Rankin Scale (0-5)</b>	Slight disability	62	18.4	<b>7.77±1.45</b>	<.05**
	Moderate disability	119	35.3	<b>7.92±1.70</b>	
	Moderately severe disability	156	46.3	<b>7.32±1.72</b>	
<b>Employment status</b>	Being employed	85	25.2	7.51±1.62	>.05
	No	244	72.4	7.65±1.72	
	Retired	8	2.4	7.37±1.06	
<b>Educational level</b>	Primary or less	28	5.9	7.25±1.97	>.05
	Primary	140	43.9	7.43±1.42	
	Secondary	57	16.9	7.54±1.47	
	Tertiary	66	19.6	8.12±1.96	
	Graduate and over	46	13.6	7.71±2.04	

**Figure 1.** Scree plot for CCS-TR (N=337)





**Figure 2.** Factor loading for CCS-TR (N=337)



### Appendix Bakım Verme Yeterliliği Ölçeği

Değerli bakım verenler,

Aşağıda hastaya bakarken algıladığınız bakım verme yeterliliğiniz ile ilgili ifadeler yer almaktadır. Sizden istenen hastaya bakarken aşağıdaki ifadeler ile ilgili kendinizi yeterli hissedip hissetmediğinizi belirtmenizdir. Sizin için en uygun olan seçeneği cevaplayın.

	Hiç Yeterli Değil	Biraz Yeterli	Yeterli	Çok Yeterli
Hastanızın bakımı ile ilgili zor bir durumla karşılaşırsanız bu durumla				

başa çıkmayı öğrendiđinize ne kadar inanıyorsunuz?				
Tüm kořulları göz önünde bulundurarak ne kadar iyi bir bakım veren olduđunuzu düşünöyorsunuz?				
Hastanıza bakım verme konusunda kendinizi ne kadar yeterli hissediyorsunuz?				
Hastanıza bakım verme konusunda kendinize ne kadar güveniyorsunuz?				

UNCORRECTED PROOF