Validity of the Turkish version of the medication adherence self-efficacy scale-short form in hypertensive patients

Hipertansif hastalarda ilaca uyum öz-etkililik ölçeği kısa formunun Türkçe'sinin geçerliliği

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ABSTRACT

Objective: Study purpose was to examine the validity of a 13-item short form of the Medication Adherence Self-Efficacy Scale-Short Form (MASES-SF) in an independent sample of 150 hypertensive Turkish patients.
Methods: This is a methodological study and 150 adult patients, who are receiving medication for hypertension in the last one year, were included as the study sample. The sample of the study was chosen with the method of simple random sampling. The study was conducted between October 25, 2010 and December 31, 2010 at Family Health Center (FHC). In this study, exploratory and confirmatory factor analyses were used for psychometric evaluation. Cronbach's alpha coefficient was used to evaluate the reliability of the scale.
Results: Confirmatory factor analysis showed that all goodness indexes were at acceptable quality: χ^2=61.72, df=65, p>0.05, GFI=0.99, CFI=1.00, RMSA=0.00. Reliability coefficient of the Turkish adaptation of MASES-SF was found as 0.94 and item-total correlations ranged between 0.13 - 0.52. Patients with uncontrolled hypertension had lower self-efficacy scores compared to those with normal blood pressure.
Conclusion: This result indicated that the preliminary criterion validity is adequate. Psychometric testing demonstrated satisfactory internal consistency and validity of the instrument for patients in the study group. It can be used confidently in determining and testing interventions to improve medication adherence self-efficacy perceptions and behaviors in hypertensive Turkish patients. The MASES-SF is brief, quick to administer, and capture useful data on medication adherence self-efficacy in hypertensive patients.
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Key words: Medication adherence, self-efficacy, hypertension, scale validation

ÖZET

Amaç: Bu çalışmanın amacı 150 hipertansif Türk hastada ilaca uyum öz-etkililik ölçeği 13 maddelik kısa formunun geçerliliğini incelemektir.
Yöntemler: Metodolojik türde olan bu çalışmanın örneklemini en az bir yıldır hipertansif tedavi alan 150 yetişkin hasta oluşturmuştur. Örnekleme alınan kişiler basit rastgele örnekleme yöntemiyle seçilmişlerdir. Çalışma 25 Ekim 2010-31 Aralık 2010 tarihleri arasında aile sağlığı merkezinde yürütülmüştür. Bu çalışmada psikometrik değerlendirme için açıklayıcı ve doğrulayıcı faktör analizleri kullanılmıştır. Ölçek güvenirliliğini belirlemek için Cronbach's alfa katsayısı kullanıldı.
Bulgular: Doğrulayıcı faktör analizinin tüm indekslerinde kabul edilebilir düzeyde olduğu belirlendi. χ^2=65 (n=150)=61.72, p>0.05, GFI=0.99, AGFI=0.98, RMSA=0.00, CFI=1.00. Türkçe'ye uyarlanan ilaca uyum öz-etkililik ölçeği kısa formunun güvenirlik katsayısının 0.94 ve madde toplam korelasyonunun 0.13-52 arasında olduğu belirlenmiştir. Kan basınçları kontrol altında olmayan hastaların öz-etkililik puanlarının, kan basınçları normal olan hastalara göre daha düşük olduğu belirlenmiştir.
Sonuç: Bu sonuç ölçek geçerliliğinin yeterli olduğunu göstermektedir. Yapılan psikometrik ölçüm, çalışılan gruptaki hastalar için kullanılan ölçeğin geçerliliğinin ve iç güvenirliliğinin yeterli olduğunu göstermektedir. Ölçek Türk hipertansif hastalarda ilaca uyum öz-etkililik algılarını ve davranışlarını geliştirmek için yapılan müdahalelerin belirlenmesinde güvenle kullanılabilir. İlaca uyum öz-etkilik ölçeği uygulaması kolay, hipertansif bireylerde ilaca uyum öz-etkililiği hakkında faydalı ve kapsamlı bilgi sağlayan bir ölçektir.
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Anahtar kelimeler: İlaca uyum, öz-etkililik, hipertansiyon, ölçek geçerliliği

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Introduction

Hypertension is a significant and often a symptomatic chronic medical condition, which calls for persistent adherence to medication regimens to reduce the risks of stroke, cardiovascular disease, and renal disease (1).

Despite the availability of effective medical therapy for hypertension, only 31% of persons with hypertension have controlled blood pressure (1). According to Paten T study, there were nearly 15 million people with hypertension in the adult population in Turkey, only thirty-one percent of hypertensive adults were taking antihypertensive medicine and among those people, only 8.1% had their blood pressure (BP) under control (2). It has been reported that unless extensive and efficacious precautions are taken, hypertension prevalence will increase more as global population ages (3). For those who are taking antihypertensive medications, good medication adherence is important to ensure optimal control of hypertension (4). Therefore, promoting medication adherence in patients with poor control of their BP is an important role for nurses and healthcare providers (5). A major contributor to poor BP control may be patient non-adherence to prescribed antihypertensive medication (6). Several other factors affect medication adherence in hypertensive patients; patient demographics, side effects of medication, convenience of drug dosing, cost and number of medications, patients' knowledge, beliefs and attitudes about hypertension and its treatment, patients' involvement with their care, and health care system issues (1).

Self-efficacy refers to an individual's judgment of his or her confidence to perform a specific task in order to reach a desired outcome. The stronger one 's self-efficacy beliefs, the more likely a person will start and maintain recommended health behaviors (7, 8). In the past years, self-efficacy theory has been used in a study to explain medication adherence behavior in hypertensive patients (9). Self-efficacy theory is a framework to understanding and achieving behavior change. Individuals believe that being healthy is a determinant of their own behavior (10). The role of self-efficacy in the maintenance of antihypertensive medication adherence was examined in a few researches (9, 11, 12). These studies demonstrated that increases in self-efficacy correlated with compliance to prescribed activities. The recent studies have shown positive correlations between controlled blood pressure and medication adherence self-efficacy in hypertensive patients (5, 12).

Measurement of medication adherence in hypertensive patients is important for the assessment of treatment efficacy. Hypertension and medication non-adherence is a global problem that is independent from culture. Adherence to appropriate medical therapy for hypertension can result in controlled blood pressure and reduction in adverse outcomes. With increasing need for long-term adherence to treatment, a reliable and valid measure of patient adherence that can be easily administered is needed (13). The Medication Adherence Self-Efficacy Scale (MASES) developed by Ogedegbe and colleagues in 2003 in order to measure medication adherence in hypertensive patients (9) was revised in 2008 and a 13-item MASES form was published (MASES-R). In this short form, number of items was decreased and answer choices were multiplied. Validity and reliability analyses were performed to obtain the short form of the scale; classical test theory and item response theory were used to reduce the number of items. As a result, a 13-item short form was prepared, whose validity will be examined in this study (11). Therefore, MASES-R can be defined as a short form of MASES (MASES-SF). It was considered that the short form would be more advantageous than the long form in terms of time efficiency for patients and health professionals in the field of practice.

The aim of this study was to assess the validity and reliability of the Turkish version of the 13 item short form of the MASES for the evaluation of adherence antihypertensive medication in Family Healthcare Centers (FHC).

Methods

Participants

This methodological study was conducted at FHC in Erzincan, Turkey. To accomplish the aim of the study, researchers recruited a total of 150 hypertensive participants were chosen with the method of simple random sampling and who visited FHC for prescription antihypertensive medications between October 25, 2010 and December 31, 2010 met the following inclusion criteria: they were (1) at least 18 years of age; (2) to have used antihypertensive medication at least one year and (3) to agree verbally to participate.

Ethical considerations

Permission to use the MASES-SF in this study was obtained from the developer [Gbenga Ogedegbe (Olugbenga.Ogedegbe@nyumc.org) on September 23, 2010] before start. The study was also approved by the FHC administration. The fact that almost all of the patients included in the study had low education levels and one-fourth were illiterate, created concerns about requesting written consent; therefore, verbal approval was received instead. Patients were invited to participate in the study and were informed before verbal consent was obtained and told to be free to leave the study at any time. The researchers also guaranteed patients that their identities and answers would be kept confidential. Completed questionnaires were stored securely.

Data collection

Data were collected through the administration of a demographic and socioeconomic question form, medication adherence self-efficacy scale (MASES-SF), face-to-face interviews with the method. In addition, patients' blood pressure measurement. Filling of the forms on average, took 10 minutes.

Instrument

The demographic and socioeconomic question form

This consisted of 10 items for the patients' questions regarding socio-demographic measures which include the participants' age, gender, education level, employment status, current marital status and health insurance coverage, Patient medications, duration of hypertension and number of medication used daily. Participants were asked to describe their economic status in the form of: income <expenditure; income=expenditure or income >expenditure.

Short-Form of Medication Adherence Self-Efficacy Scale (MASES-SF) was revised and validated by Fernandez et al. (11) in 2008, to measure situations with specific efficacy beliefs regarding adherence to prescribed antihypertensive medications in a population at high risk for hypertension-related morbidity and mortality. The MASES-SF is a 13-item, patient-derived, self-administered instrument. Items of MASES were asked to rate their degree of confidence in taking their blood pressure medications under variety of situations. The response to each item was formatted on a four-point Likert scale with 1=not at all sure, 2=a little sure, 3=fairly sure and 4=extremely sure. All responses were added to obtain a summary score with higher scores indicating greater self-efficacy (11) (See appendix 1). The MASES-R has a Cronbach's alpha coefficient were .92 and .90 at baseline and 3 months respectively. Results of the Cronbach's alpha and test-retest reliability demonstrate that this MASES is internally consistent and yields stable scores over time (11). The MASES-SF is brief, quick to administer and can capture useful data on adherence self-efficacy. In this study, the internal reliability coefficient for the MASES was 0.94 and item-total correlations ranged between 0.13 - 0.52.

Blood pressure measurement

Blood pressure readings were measured twice by researchers at the FHC. The mean reading of the two measurements were categorized according to the Joint National Committee-7 (3). Blood pressures were measured at the beginning of interview. After 10-15 minutes of resting period, systolic and diastolic blood pressures were obtained from the right arm of the subjects in a seated position. Two successive measurements were performed at intervals of 5 minutes and the average of the two recordings was calculated. The subjects were mandated to avoid caffeine (coffee, colas) intake and not to smoke 30 minutes prior to blood pressure measurement. Control of hypertension was defined as systolic BP<140mmHg and diastolic BP<90 mmHg (3). A sphygmomanometer (ERKA) was used for the measurements. Systolic (SBP) and diastolic blood pressures (DBP) were recorded based on Korotkoff sounds.

Variables

Medication adherence self-efficacy scale score, blood pressure results, demographic variables of patient; age, education status, gender, economical level, marital status, and clinical variables; duration of hypertension, number of medications used daily and duration of treatment.

Methodology

The 13-item short form of MASES has been excerpted from its 26-item form (11). In 2009, the MASES was adapted for the Turkish language and it was found that Turkish form of the MASES was reliable and validity (12). As with the original one, the items of the short form in this study were excerpted from the 26 item Turkish form. Therefore, the language validity was not re-tested, but only item number 3 was reworded for clarification. In order to increase the pellucidity of the 3rd question, only the phrase "When you worry about taking them for the rest of your life" was replaced as "When you worry about taking them during your life". Detailed information on the study design and methods of the study are outlined elsewhere (12).

Statistical analysis

All data were performed using the Statistical Package for the Social Sciences (SPSS v11.5, SPSS Inc. Chicago) and Linear Structural Relationships (Lisrel v8.5, Scientific Software International Inc. Lincoln). There were no missing values in the data. Descriptive statistics were computed for demographic features, for frequency of hypertensive patient who were classified according to JNC-VII and for each item of the translated MASES. Basic summary statistics (e.g. mean, standard deviation, minimum, and maximum, missing values) were calculated for each variable. Exploratory and confirmatory factor analyses were used to determine the psychometric properties of the instrument. Principal component analysis was used for exploratory factor analysis. All factors with values greater than or equal to 1.0 (unity root criterion) were retained (14). A first-order confirmatory factor analysis of data from MASES-R (Tr) was conducted. Various fit indices were used to determine if the proposed model's covariance structure differed from the observed relationships. Goodness of the calculated fit indices included the Pearson Chi-square (χ^2) statistic with degrees of freedom, the goodness of fit index (GFI), the comparative fit index (CFI) and the root mean error of approximation (RMSEA). Internal consistency of scale was tested using Cronbach's alpha reliability coefficients. Reliability was also assessed by interpreting the item-total scale correlations. To provide known group validity for the scale, the mean self-efficacy scores of patients with controlled blood pressure were compared with that of patients with uncontrolled blood pressure using JNC-7 blood pressure classification (3). We hypothesized that patients with controlled blood pressure would report higher mean self-efficacy scores than those with uncontrolled blood pressure. The mean self-efficacy scores of patients with controlled blood pressure were computed with t-test for diastolic and systolic blood pressure. For all analysis, $p<0.05$ was considered significant.

Results

General characteristics of the participants

General characteristics of the sample are given in Table 1. The mean age of participants was 61.6±9.52 years. Majority of participants are housewife, retired or unemployed (98.0%), had high school or less education level (96.7%), married (75.3%) and described their income as "income=expenditure" (53.3%) according to self-report of participants. The mean duration of hypertension diagnosis was 8.88±7.08 years and number of medications used daily was 1.40±0.71. At the time of the study, the mean duration of medication for them was 8.57±6.87 years (Table 1). All of the participants had health insurance.

Construct validity

Exploratory factor analysis

The Kaiser-Meyer-Olkin and Barlett tests were applied before evaluating the results of exploratory factor analysis. The Kaiser-Meyer-Olkin measurement of sampling adequacy was 0.91 and Barlett test results were quite significant (χ^2=1393. 61, SD 78, p=0.000). Later, we used exploratory factor analysis to guide the factor structure. Principal components factoring was performed on all 11 items. A minimal factor-item correlation of 0.40 was set for inclusion of an item in a factor (15).

The initial analysis extracted only one factor. The variance reported 59.03%. The loadings ranged from 0.69 and 0.84 in the rotated pattern matrix in present study (Table 2).

Table 1. General characteristics of the sample (n=150)

Descriptive characteristics			
Age, years		61.60±9.52	
Sex, n (%)			
	Female	87	(58.0)
	Male	63	(42.0)
Education level, n (%)			
	Illiterate	40	(26.7)
	Literate	25	(16.7)
	Primary school (5 years)	68	(45.3)
	Secondary school (8 years)	10	(6.7)
	High school (11 years)	2	(1.3)
	University	5	(3.3)
Employment status, n (%)			
	Employed	3	(2.0)
	Housewife	84	(56.0)
	Retired	56	(37.3)
	Unemployed	7	(4.7)
Marital status, n (%)			
	Married	113	(75.3)
	Widowed	33	(22.0)
	Divorced	4	(2.7)
Economic status			
	Income<expenditure	67	(44.7)
	Income=expenditure	80	(53.3)
	Income>expenditure	3	(2.2)
Duration of hypertension, years		8.88±7.08	
Number of medications used daily, number		1.40±0.71	
Duration of treatment, years		8.57±6.87	

Data are presented as mean±SD and number (percentage)

Confirmatory factor analysis

Confirmatory factor analysis was subsequently applied to data in order to examine the construct validity of the five factor models extracted from the EFA. Initially, 13 predictors (items) were used to test the model.

Factors loading of items were found to be between 0.55 and 0.76 after the application of confirmatory factor analysis (Fig. 1). All factor loadings were found to have a critical ratio (CR) that was greater than 1.96, indicating statistical significance. The fit indices for the 13 items-model (final model) were χ^2=61.72, df=65, p>0.05, GFI=0.99, CFI=1.00 and RMSEA=0.00, indicating that this alternative model has a better fit with the data.

Modification indices for the regression weights were examined next to identify the parameters that were indicative of cross-loadings and misspecifications. However, modifications were not performed, because a remarkable improvement on fit indexes was not observed. The model was accepted in its current form considering its complexity.

Instrument reliability

Cronbach's alpha is an index of the degree to which a measuring instrument is internally reliable (16). A reliability coefficient of 0.70 or above is accepted as evidence of internal consistency for new instruments (17).

Table 2. Factor loadings* for MASES-SF

Item	Factor loading
Item1	0.81
Item2	0.75
Item3	0.76
Item4	0.80
Item5	0.80
Item6	0.77
Item7	0.72
Item8	0.84
Item9	0.71
Item10	0.78
Item11	0.77
Item12	0.69
Item13	0.78
Exp. Variance: 59.03%	

*Exploratory Factor Analysis

Table 3. Item analysis of the MASES-SF* (n=150)

	Mean	SD**	ITC***	Croncbach's alpha if item deleted
How confident are you can take your blood pressure medications				
1. When you are busy at home	2.73	.95	.769	.935
2. When there is no one to remind you	2.77	.86	.698	.937
3. When you worry about taking them during your life	2.92	.76	.712	.937
4. When you do not have symptoms	2.88	.90	.759	.936
5. When you are with family members	2.85	.84	.758	.936
6. When you are in a public area	2.81	.83	.721	.937
7. When the time to take them is between your meals	2.90	.84	.675	.938
8. When you are traveling	2.91	.86	.800	.934
9. When you take them more than once a day	2.83	.85	.661	.939
10. When you have other medications to take	2.96	.78	.733	.937
11. When you feel well	2.87	.93	.725	.937
12. If they make you want to urinate while away from home	2.84	.89	.634	.940
Please rate how sure you are you that you can carry out the following task				
13. Make taking your medications part of your routine	3.11	.77	.731	.937

*MASES-SF indicates Medication Adherence Self - Efficacy Scale, Turkish version
**SD=Standard Deviation
***Item - Total Correlation

Table 4. Patients' perceive self-efficacy for medication adherence related to controlled and uncontrolled blood pressure

		MASES-SF*		
Variables	**n**		**t#**	**p#**
Systolic blood pressure**				
Controlled (≤139 mmHg)	67	39.59±8.49	2.948	0.004
Uncontrolled (140 and upper, mmHg)	83	35.59±8.09		
Diastolic blood pressure**				
Controlled (≤89 mmHg)	86	39.76±7.35	4.189	<0.0001
Uncontrolled (90 and upper, mmHg)	64	34.19±8.90		

#-t test for independent samples
*The range of item possible scores was 1-4, where 4 points represented good medication adherence
The range of total scores was 13-52
**It was classified according to JNC-7.2003

Descriptive statistics of the MASES-SF scores are presented in Table 3. Mean item scores ranged from 2.73 to 2.96. Item total correlations for almost all items were acceptable except two items. Chronbach's alpha for the including item were .94 and they were .93 when these items were deleted (Table 3).

As seen Table 4, it was found that patients with controlled blood pressure has higher mean self-efficacy scores than those with uncontrolled blood pressure (diastolic blood pressure $p<0.001$, systolic blood pressure $p<0.01$) (Table 4).

Discussion

This study reports the development and evaluation of a medication adherence scale that is easy to administer. In this study, we validated the Turkish translation of the MASES-SF in a convenient sample of 150 patients with hypertension in FHC in Turkey. The validation study of the Turkish version of the MASES-SF demonstrates that this scale presents excellent psychometric properties for the detection of medication adherence of patients with hypertension in primary care settings. It would appear that the psychometric properties of the Turkish adaptation of the MASES-SF are good and similar to those of the English (American) version (11). The results of this study show that the MASES-SF in its original version developed in the USA had satisfactory acceptability, internal consistency and content validity when used in Turkey.

The evaluation and revision of the MASES was described in this paper. The MASES-SF consists of 13 items that accesses an individual's judgment of their ability to adhere to prescribed antihypertensive medications under a variety of challenging situations. Twelve of the items ask about confidence in specific situation (e.g. busy at home, no symptoms, travelling) and one item asks about confidence in ability to make medication adherence a part of daily routine. There are no subscales on the measure but rather the total score ranges from 1 to 4 and it is the average score of all 13 items. Pellucidness of scaled items, appropriateness to targeted users and learned opinions are used as prediction factors for scope and structure validation (15). We used the Kaiser-Meyer-Olkin (KMO) measurement of sampling adequacy

and Bartlett's test of sphericity to determine whether the data were appropriate for factor analysis. The value of KMO measurement of sampling adequacy obtained from the analysis was 0.91, indicating that the sample size is adequate for principal component analysis. Similarly, the results obtained from Bartlett's test of sphericity (χ^2=1393. 61, SD 78, p=0.000) indicated that the variables are correlated and therefore suitable for factor analysis (18).

The initial analysis extracted only one factor. The loading ranged from 0.69 to 0.84 in a pattern matrix in present study. Factor load of all test items are above 0.40 (Table 2). In principal, the component analysis results indicate that the structure validity of the scale is at an acceptable level (15). Confirmatory factor analysis is a method based on the evaluation of fit indexes demonstrating the coherence between the data and structure. In this study, all fit indexes were almost perfect. When fit index values in the literature were reviewed, it was observed that coherence was considered perfect when χ^2/DF ratio was below 2, CFI, GFI and AGFI values were higher than 0.95 and RMSA values were lower than 0.05 (19). Results of this study indicate that the data comply with the theoretical structure perfectly for the χ^2/DF, CFI, RMSA results and reasonably for the GFI result.

Cronbach alpha coefficient of MASES-SF was determined as 0.94 and the scale were found to be highly safe (17, 18). Item analysis is another method that shows the internal consistency of a scale. In this study, item-total score correlations and values of alpha coefficient if item deleted were calculated. Item-total score correlation was found to be 0.40. Items with higher values

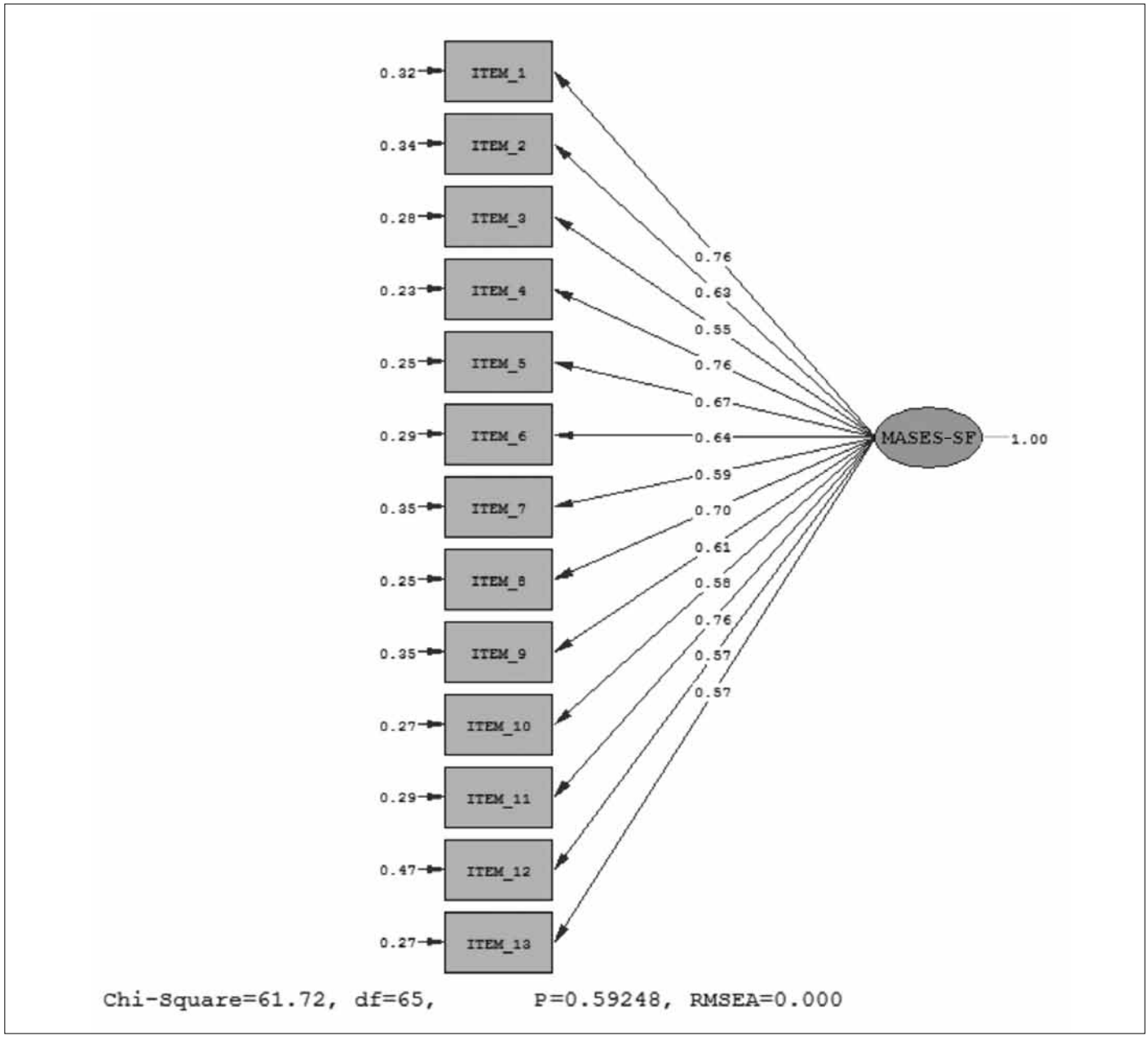

Figure 1. Factor loadings for MASES-SF

are considered to be better distinguishers. Items with coefficient value less than 0.30 are recommended to be excluded from the scale regardless of their statistical significance (20). Item-total correlation in this study is statistically significant for all items; item 3 has the lowest item-total correlation with a value of 0.76, and all items have values above 0.40 (Table 3).

Although patients taking medication who have uncontrolled hypertension are often considered to have refractory hypertension, a significant factor contributing to poor blood pressure control is patient non-adherence to prescribed therapy. It is estimated that adherence rates are approximately 50% for medications (1). Poor adherence with antihypertensive therapy sufficient to result in loss of antihypertensive control may cause reversal of beneficial effects on stroke, cardiovascular disease, hypertensive neuropathy and retinopathy (21, 22). Consistent control of blood pressure requires that patients with hypertension follow medication (23).

As expected, blood pressure was significantly related to medication adherence self-efficacy, such that patients with controlled blood pressure had higher mean self-efficacy scores than those with uncontrolled blood pressure (Table 4). As seen in this table, a 4-point difference was found between the MASES-SF scores of patients whose systolic blood pressure was controlled and those uncontrolled. Similarly, an almost 5-point difference was observed in diastolic blood pressure. This finding suggests that the scale is clinically significant, as it has a high prediction power and can distinguish controlled and uncontrolled patients.

This result indicates that the preliminary criterion validity of MASES-SF is adequate. In a study conducted by using the Turkish form of the original MASES, it was determined that medication adherence education given to hypertensive patients resulted in a decrease in patients' medication adherence self-efficacy perceptions and a decrease in blood pressures (5). Furthermore, it was also reported in other studies that blood pressure control rate was better in adherent patients compared to non-adherent patients (24, 25) and having knowledge about the disease increased adherence (26). A statistically significant difference in self-efficacy scores between the adherent and non-adherent patients with adherent patients obtaining higher scores on the self-efficacy scale was revealed (27). In another study with hypertensive patients, good self-efficacy was statistically significantly associated with increased prevalence of adherence to medication (28).

Therefore, health professionals, who work with hypertensive patients should ensure the regular dosage of their patients' medication, increasing the medication adherence/self-efficacy perceive through trainings and consequently keep their blood pressure under control. Therefore, we conclude that public health nurses should try to increase self-efficacy perception related to antihypertensive medication adherence in patients who come to primary health care units or FHC for blood pressure measure.

Appendix 1. Turkish version of MASES-SF questionnaire (adopted with permission from reference 11)

İlaç tedavisine uyum öz-etkililik ölçeği kısa formu

İnsanların doktorları tarafından yazılan ilaçları almasını zorlaştıran bazı durumlar ortaya çıkar. Böyle durumların bir listesi aşağıdadır. Biz sizin bu durumların her biri ile ilgili olarak tansiyon ilaçlarınızı almanız hakkındaki düşüncenizi bilmek isteriz. Lütfen kutuları kontrol ederek görüşünüze en yakın cümleleri işaretleyiniz. **Doğru ve yanlış cevap yoktur.**

Aşağıda sıralanan her bir durum karşısında tansiyon ilaçlarınızı **HER ZAMAN** alabileceğinizden ne kadar emin olduğunuzu lütfen işaretleyiniz.

Tansiyon ilaçlarınızı her zaman alabileceğinizden ne kadar emin olabilirsiniz	**Hiç Emin Değilim**	**Biraz Eminim**	**Eminim**	**Çok Eminim**
1. Evde meşgul olduğunuzda	( )	( )	( )	( )
2. Size hatırlatacak birisi olmadığında	( )	( )	( )	( )
3. Yaşamınız boyunca ilaç kullanmanız gerektiği konusunda endişelendiğinizde	( )	( )	( )	( )
4. Tansiyonunuzun yükseldiğine dair belirtiler görülmediğinde	( )	( )	( )	( )
5. Ailenizle beraber olduğunuzda	( )	( )	( )	( )
6. Ev dışı sosyal ortamlarda bulunduğunuzda	( )	( )	( )	( )
7. Öğünler arasında almanız gerektiğinde	( )	( )	( )	( )
8. Seyahatlerde	( )	( )	( )	( )
9. Günde birden fazla almanız gerektiğinde	( )	( )	( )	( )
10. Başka ilaçları kullanmanız gerektiğinde	( )	( )	( )	( )
11. Kendinizi iyi hissettiğinizde	( )	( )	( )	( )
12. Evden uzakta iken idrara çıkmaya neden olduğunda	( )	( )	( )	( )
Aşağıdaki işlemi her zaman yapabileceğinizden ne kadar emin olabilirsiniz?				
13. İlaçlarınızı almayı günlük yaşamınızın bir parçası yapacağınızdan	( )	( )	( )	( )

Study limitations

First limitation of the study is the low educational level of the majority of the individuals included in the study, although it has no impact on the reliability of the scale.

The second limitation is the fact that randomization method was used in selection of the study sample. Hence, the results obtained are limited to those of patients who referred to any FHC in Erzincan province, and these results do not represent hypertensive patients in the general population. Another limitation is failure to make a re-test due to the difficulty to re-contact with the same patients after a while.

Conclusion

The results obtained from both exploratory and confirmatory factor analyses indicate that the factor structure of MASES-SF may provide an applicable scale. In summary, the data presented in this study provide initial data supporting the reliability and validity of the MASES-SF, a shortened version of the MASES, for use in samples of hypertensive Turkish. As constructive validity is an ongoing process, validity and reliability of MASES-SF should be reassessed with each new population.

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