ORIGINAL ARTICLE
ORİJİNAL ARAŞTIRMA

# Self-Efficacy Scale for Appropriate Medication Use: Turkish Adaptation, Validity and Reliability Study

## Uygun İlaç Kullanımı için Öz Yeterlilik Ölçeği: Türkçe Uyarlaması, Geçerlik ve Güvenirlik Çalışması

Emine Nur Bakır, Gökçe İşcan, Funda Yıldırım Baş

Suleyman Demirel University School of Medicine Department of Family Medicine Isparta, Turkey

## ABSTRACT

**Aim:** Drug use in chronic diseases is a severe problem noticed by physicians in our country. Chronic disorders are treatable with medicine however, ensuring drug compliance is difficult. The Turkish translation of the Self-Efficacy for Appropriate Medication Use Scale is forthcoming. Its reliability and validity will be examined among patients with at least a year of chronic illness.

**Material and Method:** Between July 2021 and December 2021, 414 individuals were interviewed face-to-face at Isparta Family Health Centers. The participants were administered the Turkish versions of the Self-Efficacy for Appropriate Medication Use Scale (T-SEAMS), the General Self-Proficiency Scale, and the Morisky Medication Adherence Scale (MMAS-8). There were evaluations of construct validity, convergent validity, internal consistency, and test-retest reliability.

**Results:** According to the item analysis, item-to-total correlations varied between 0.349 and 0.607. One exploratory factor with factor loadings ranging from 0.496-0.811 explained 51.48% of the total variance. Acceptable results were obtained from a confirmatory factor analysis (X2/df=3,031, RMESA=0.070, CFI= 0.965, GFI= 0.945, and TLI= 0.952). Positive correlations were found between the convergent validity of the T-SEAMS and the validated MMAS-8 and General-Self-Proficiency Scale (r=0.607, p=0.001, r=0.349, p=0.001, respectively). Excellent internal consistency (Cronbach's alpha = 0.916) and test-retest reliability (Pearson's correlation coefficient = 0.702, p=0.001) were observed.

**Conclusion:** The T-SEAMS is a quick and good psychometrically analyzing instrument for evaluating medication adherence self-efficacy in Turkish people with chronic diseases.

**Keywords:** Self-efficacy, medication therapy management, chronic disease, medication adherence, self-assessment

## ÖZ

**Amaç:** Kronik hastalıklarda ilaç kullanımı ülkemizde hekimler tarafından fark edilen ciddi bir sorundur. Kronik hastalıklar ilaçla tedavi edilebilir ancak ilaç uyumunu sağlamak zordur. Çalışmamızda, buna katkıda bulunacağına inandığımız Uygun İlaç Kullanımı için Öz Yeterlilik Ölçeği'nin en az bir yıllık kronik hastalığı olan hastalar arasında Türkçe uyarlamasını, geçerlik ve güvenirliğini yapmayı amaçladık.

**Gereç ve Yöntem:** 1 Temmuz 2021 ve 31 Aralık 2021 tarihleri arasında Isparta Aile Sağlığı Merkezlerinden rastgele seçilen bir tanesinde 414 kişiyle yüz yüze görüşüldü. Katılımcılara Uygun İlaç Kullanımı için Öz Yeterlilik Ölçeği, Genel Öz Yeterlilik Ölçeği ve Morisky İlaç Uyum Ölçeği'nin (MMAS-8) Türkçe versiyonları uygulandı. Yapı geçerliliği, iç tutarlılık ve test-tekrar test güvenilirliği değerlendirildi.

**Bulgular:** Madde analizine göre, madde-toplam korelasyonları 0.349 ile 0.607 arasında değişmekteydi. Faktör yükleri 0.496-0.811 arasında değişirken, tek bir faktör toplam varyansın %51.485'ini açıklamaktaydı. Doğrulayıcı faktör analizinden kabul edilebilir sonuçlar elde edilmiştir ( X2/df = 3.031, RMESA = 0.070, CFI = 0.965, GFI = 0.945 ve TLI = 0.952). T-SEAMS ile geçerliliği kanıtlanmış MMAS-8 ve Genel Öz-Yeterlilik Ölçeği arasında pozitif korelasyonlar bulundu (sırasıyla r=0,607, p=0.001; r=0,349, p=0.001).Ölçeğin mükemmel iç tutarlılık (Cronbach's alpha = 0.916) ve test-tekrar test güvenilirliği (Pearson korelasyon katsayısı = 0.702, p=0.001) olduğu saptandı.

**Sonuç:** T-SEAMS'in, kronik bir hastalığı olan Türk bireylerde ilaca bağlılık öz yeterliliğini değerlendirmek için hızlı ve psikometrik olarak sağlam bir araç olduğu tespit edildi.

**Anahtar Kelimeler:** Öz-yeterlilik, ilaç tedavisi yönetimi, kronik hastalık, ilaç uyumu, öz-değerlendirme

**Corresponding Author**: Gökçe İşcan
**Address**: Suleyman Demirel University School of Medicine Department of Family Medicine Isparta, Turkey
**E-mail**: dr_gokcedilek@yahoo.com

## INTRODUCTION

Chronic diseases are the major causes of death worldwide and are among the most critical health issues of the 21st century. The World Health Organization (WHO) revealed in 2018 that chronic diseases were responsible for 71% of the 57 million deaths globally in 2016, and 89% of the 455 thousand deaths in Turkey (1).

The management of chronic diseases frequently employs disease-specific protocols. While a condition-specific guideline is effective for a single disease, it may not be suitable for people with numerous disorders (2-6). The comprehensive, ongoing, and collaborative approach are one of the fundamental first-stage components of chronic disease care (7). These characteristics make primary health care services suitable for the management of chronic diseases. According to the Turkish Chronic Diseases and Risk Factors study, 61% of patients do not adapt to their medications, and 25% do not adapt to non-medical treatments (8).

This study aimed to increase drug adherence by assessing the validity and reliability of the Turkish version of the Self-Efficacy for Appropriate Medication Use Scale (SEAMS) and determining self-sufficiency in individuals with chronic conditions.

## MATERIAL AND METHOD

This study is a methodical evaluation of the validity and reliability of the Turkish version of the Self-Efficacy for Appropriate Medication Use Scale (SEAMS). From 01 July to 31 December 2021, in-person surveys were conducted at the randomly selected Yedişehitler Family Health Center of Isparta. The study comprised patients between the ages of 40 and 70 who were mentally and physically capable of self-administering their medications, who had been diagnosed with chronic conditions for at least a year, and who had not used neurological and psychiatric drugs.

For general psychometric techniques, it is recommended to have at least 10 participants for each item of the instrument (9,10) given that at least 130 participants are scheduled for this scale of 13 items and 300-500 participants are necessary for various research (11). Therefore, at least 300 persons have been attempted to contact. People who applied to the family health center between the specified dates, completed the questionnaire, and met the inclusion requirements were examples of the study. No power analysis was performed.

### Instruments

- **Socio-Demographic Data Form:** In this form, created by the researcher by studying the relevant literature, age, gender, marital status, education status, occupation, income level, social security, other diseases, duration of chronic illness, the frequency of doctor control, the number of medications taken per day, the presence of the person who helped with the medication, the preferred drug usage form, the time of day when the drug was being forced, whether the use of the drugs given was sufficiently explained.

- **The Morisky Medication Adherence Scale (MMAS-8):** The Morisky-8 medication adherence scale, developed by Donald E. Morisky (12) is commonly used to evaluate patient harmony. In numerous nations, it has been validated and found to be valid and reliable for use with various patient populations (13,14) and so reliable for various diseases, including diabetes, hypertension, asthma, and chronic obstructive pulmonary disease (15, 16). The first seven items on the scale are yes-no, and the eighth item is a 5-point Likert scale: 'never,' 'almost never,' 'occasionally,' 'frequently,' and 'always.' Every 'yes' response for the first seven questions - the answers are reversed except for question 5 - receives 0 points, while every 'no' response receives 1 point. Question 8 awards 1 point for the response "never" and 0 for all other responses. The scale's minimum value is 0, and its maximum value is 8. Below a score of six on the Morisky scale, compliance is considered low, whereas a score between seven and eight indicates complete compliance (17,18).

- **Self-Efficacy for appropriate Medication use Scale (SEAMS):** Risser and Arc developed the original SEAMS. Reduced from the original 21 items to 13 for patients with chronic disease. The final scale consists of thirteen questions regarding patients' medication perspectives. The 3-point Likert scale is encoded with the responses 'i'm not sure I can get my medicine right' (1 point), 'i'm somewhat certain I can get my medicine right' (2 points), and 'i'm very certain I can get my medicine right' (3 points). The scale has a minimum of 13 points and a maximum of 39 points. Higher scores indicate greater drug compliance and self-sufficiency (19). Numerous countries have evaluated the validity and reliability of the scale, which is valid and reliable (19-23).

- **General Self-Proficiency Scale:** Schwarzer and Jerusalem in Germany first developed in 1979. The scale, developed initially with 20 items, was reduced to 10 items in 1981 and brought to its final state in 1995 with corrections made by the same researchers. The 4-point Likert scale is encoded with a 1-point response to 'completely incorrect' and a 4-point response to 'fully correct' (24). The Turkish version of the scale is valid and reliable and has 0.80 Cronbach's alpha coefficient for the total scale (25).

### Translation and Adaptation of the Scale

Following Risser's approval for the adaptation and usage of the SEAMS, we translated it as the following global standards (26):

**Translation and back translation:** First of all, two translators, one of them was the mother tongue of English, and the other was fluent in both languages. Then another translator made the reverse translation, related to family metdicine and chronic illnesses. Both were compared, and necessary adjustments were made. Both translations were observed, and some words/sentences were corrected.

**Content Validity (Expert Committee):** Using a content validity index (CVI) with a four-point rating scale, specialists evaluated the relevance and repetition of the material in each item of the original SEAMS in the Turkish culture. According to the experts' evaluation, the SEAMS CVI was 0.87, indicating that its content was sufficient and valid.

**Pilot Study:** Using the Test-Retest method, researchers administered the scale to 18 individuals after a 2-week delay to demonstrate the scale's independence from time and assess the items' readability. It was decided that T-SEAMS was acceptable and understandable (**Figure 1**).
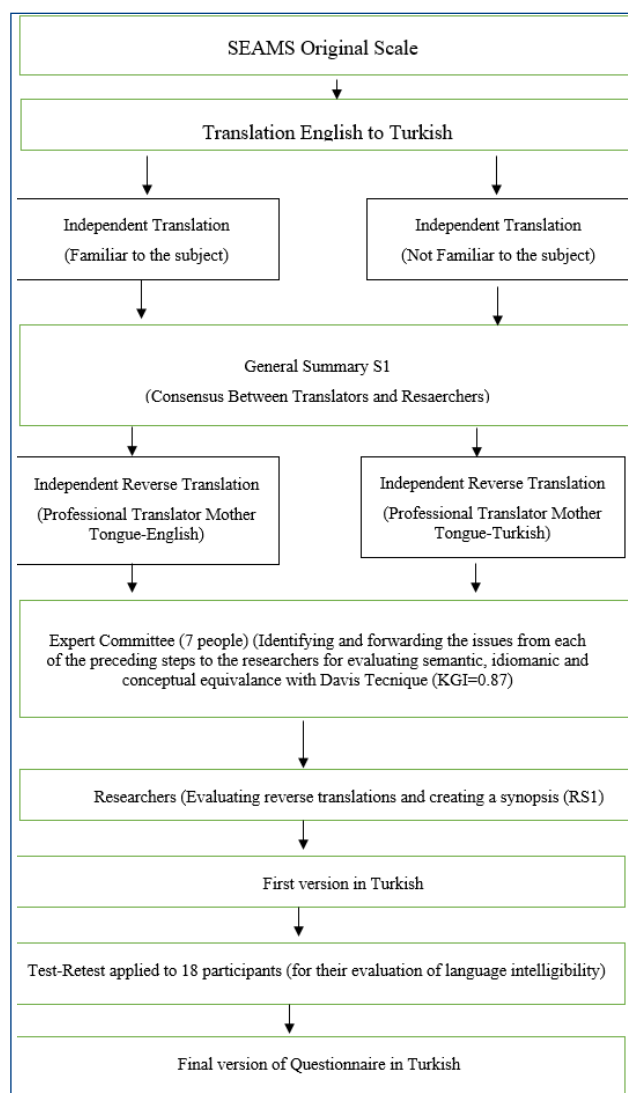


**Figure 1.** Steps followed during adaptation

**Data Collection**

Researchers approached participants with an information sheet; after obtaining informed consent, questionnaires were distributed. If there were unanswered questions on a questionnaire, it was excluded from the study. Participants completed the surveys independently, with assistance provided if they displayed signs of fatigue or had difficulty writing their responses.

**Statistical Analysis**

It was finished in five phases. These were item analysis, structure and content validity, internal consistency, and test-retest reliability.

AMOS 20.0 (IBM Corporation) was used for confirmatory factor analysis (CFA), and SPSS 26 (SPSS Inc., Chicago, IL, USA) was used for all other analyses. The sample was described using mean values, standard deviations, frequencies, and percentages.

An EFA was conducted to evaluate the scale's structural validity and the relationship between variables. CFA was performed to validate the factor analysis results. After performing explanatory factor analysis, the KMO-Barlett test is conducted. When two measurements that are believed to measure the same underlying processes yield comparable results or a strong correlation, convergent validity is present (27). Using Pearson's correlation coefficients, convergent validity was established between T-SEAMS and MMAS-8 scale scores. It was anticipated that participants with higher T-SEAMS scores would have higher MMAS-8 scores. The correlation between scale point values was computed using the Pearson moments multiplication formula, with the MMAS-8 scale and the SEAMS used concurrently to evaluate the validity of the criteria.

To determine scale reliability, internal consistency and test-retest reliability methods were utilized. The Cronbach's alpha coefficient was calculated to determine the reliability of the internal consistency. A Cronbach's alpha of 0.70 or greater indicates good internal consistency (9) in most cases. To determine the test-retest reliability of the scale, the time-versus-time invariability of the scale was calculated using the "Test-Retest Method" and a sample of 18 individuals. The correlation coefficient can range between -1 and 1, with values between 0.40 and 0.60 denoting moderate to substantial agreement and values above 0.60 denoting substantial agreement.

**Ethical Considerations**

The dates 04.01.2021 and 72867572-050.01.04-677 have been approved by the Ethics Board of Clinical Studies at the Süleyman Demirel University Faculty of Medicine.

The dates 13.04.2021 and E-16657963-799 were obtained from the Isparta Provincial Health Directorate to survey Family Medicine units.

This study utilized the "Self-Efficacy for appropriate Medication Use Scale" (SEAMS). This scale was obtained via email on 13.02.2022 from Jessica Risser Corwin, the principal author of the development team.

## RESULTS

A total of 414 people were included in the study. The average age of the participants was 55.38±10.04. 57.5% of respondents (n=238) were women, 42.5% (n=176) were men. 83.6% (n=346) of respondents were married, 16.4% (n=68) were single. The other socio-demographical features are listed in **Table 1**.

**Table 1. Demographics of the participants**

| Features | Mean±SS | Median (Min-Max) |
|---|---|---|
| Age | 55.38±10.04 | 56 (40-70) |
| | **n** | **%** |
| Gender | | |
| Woman | 238 | 57.5 |
| Male | 176 | 42.5 |
| Marital Status | | |
| Married | 346 | 83.6 |
| Single | 68 | 16.4 |
| Education | | |
| No reading. no writing | 26 | 6.3 |
| It's just reading and writing | 13 | 3.1 |
| Elementary school | 152 | 36.7 |
| Secondary school | 41 | 9.9 |
| High school | 94 | 22.7 |
| University/College | 88 | 21.3 |
| Working Status | | |
| Not working | 171 | 41.3 |
| Retired | 88 | 21.3 |
| Officer | 116 | 28.0 |
| Free trade | 39 | 9.4 |
| Income Level | | |
| Less than minimum wage | 70 | 16.9 |
| Minimum wage level | 114 | 27.5 |
| Above minimum wage | 230 | 55.6 |
| Social security | | |
| None | 13 | 3.1 |
| SII | 234 | 56.5 |
| Retired | 145 | 35.0 |
| Green card | 21 | 5.2 |
| Special Insurance | 1 | 0.2 |
| Sd: Standart Deviation SII: Social Insurance Institution | | |

### Analysis Results of Validity and Reliability

In item analysis, SEAMS average points of items vary between 1.76 and 2.70, while Cronbach's alpha values vary between 0.905 and 0.912. Cronbach's alpha would not have improved if any scale items were eliminated (**Table 2**).

**Table 2. Mean, Standard Deviation, and Cronbach α values of SEAMS Items**

| Number | Mean±SD | Cronbach α |
|---|---|---|
| 1 | 2.55±0.63 | 0.908 |
| 2 | 2.52±0.62 | 0.907 |
| 3 | 2.47±0.68 | 0.906 |
| 4 | 2.36±0.69 | 0.906 |
| 5 | 1.76±0.84 | 0.919 |
| 6 | 2.63±0.62 | 0.909 |
| 7 | 2.49±0.61 | 0.906 |
| 8 | 2.40±0.67 | 0.905 |
| 9 | 2.15±0.77 | 0.909 |
| 10 | 2.32±0.71 | 0.909 |
| 11 | 2.70±0.56 | 0.910 |
| 12 | 2.47±0.75 | 0.912 |
| 13 | 2.61±0.66 | 0.912 |

### EFA and CFA results

Exploratory factor analysis was performed to assess the scale's structural validity. The KMO value and Bartlett test were looked at to determine the factorability of the sample. The scale has a KMO value of 0.887 (very good). The results of the Barlett Test, which were made to test the homogeneity of the prevalence of the dispersions, were determined as x2=3316.15, p<0.001, and this result was evaluated as an advanced significance. Basic components analysis and the varimax rotation method were used to explain the factor structure that formed the scale. When the scale's factor structure was examined, the scale was evaluated in the initial variance analysis and scree plot values in accordance with the 2-factor structure. Still, since there is a moderate correlation between the factors of the scale, it was decided that they could not be able to examine as entirely separate topics. It was found that the single factor explained 51.48% of the total variation. As the variant value described on the scale is > 0.40, it has been decided that it is sufficient for a single factor (**Table 3**) (28). This was also preferred because the scale was originally single-factor.

**Table 3. Patterns Coefficients of Factor Analysis with Varimax Rotation loaded into a Single Factor**

| Items | Factor 1 |
|---|---|
| 8. If your order is compromised | 0.811 |
| 7.If you didn't get the medicine at the right time | 0.784 |
| 3. If you're not home | 0.783 |
| 2.If you use the same drug more than once a day | 0.779 |
| 4. If your day is a little busy | 0.779 |
| 1.If you take a few different medications every day | 0.755 |
| 6. If no one reminds you to take the medicine | 0.733 |
| 11.If you feel ill (such as cold or flu) | 0.701 |
| 10.If you are not sure what time of day you will take the medicine | 0.689 |
| 9.If you're not sure how to use the drug | 0.684 |
| 12.If you have taken the drugs you are using and some of these drugs appear to be different from normal | 0.640 |
| 13. If the doctor changes your medication | 0.630 |
| 5. If the drugs have side effects | 0.496 |

**Table 4. The total variance of substances and Factors in Factor Analysis with Load of substances to a Single Factor**

| Items | Total | Variance (%) | Total | Variance (%) | Cumulative (%) |
|---|---|---|---|---|---|
| 1 | 6.693 | 51.485 | 6.693 | 51.485 | 51.485 |
| 2 | 1.232 | 9.478 | | | |
| 3 | 1.026 | 7.889 | | | |
| 4 | .782 | 6.018 | | | |
| 5 | .617 | 4.746 | | | |
| 6 | .551 | 4.240 | | | |
| 7 | .471 | 3.620 | | | |
| 8 | .441 | 3.389 | | | |
| 9 | .317 | 2.438 | | | |
| 10 | .277 | 2.127 | | | |
| 11 | .232 | 1.785 | | | |
| 12 | .223 | 1.713 | | | |
| 13 | .139 | 1.071 | | | |

Confirmatory Factor Analysis (CFA) was made to verify the factor analysis results with the Amos package program. And one-factor model was tested with CFA (**Figure 2**). Chi-square/degree-of freedom ratio (X2/df), root-mean-square error of approximation (RMSEA), goodness-fit index (GFI), adjusted goodness-of-fit index (AGFI), and comparative fit index (CFI) were used to measure the overall fitness of the data model (**Table 5**).
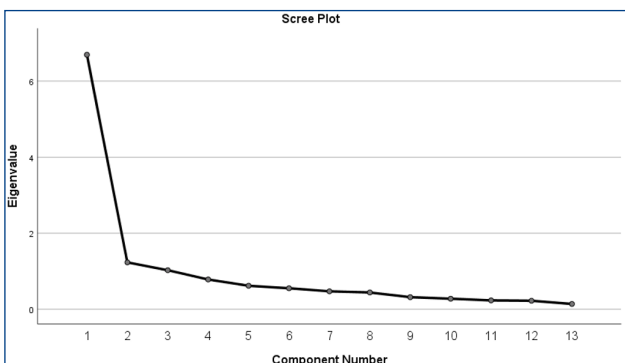


**Figure 2.** Scree plot graph of SEAMs factor analysis results

**Table 5. SEAMS CFA Model Compliance Criteria**

| Acceptable Compliance Indexes | Calculated Compliance Indexes |
|---|---|
| χ2/df<5 | 3.031 |
| RMSEA<0,08 | 0.070 |
| CFI>0,90 | 0.965 |
| GFI>0,90 | 0.947 |
| IFI>0,90 | 0.966 |
| TLI>0,90 | 0.952 |
| SRMR<0,05 | 0.017 |

CFA: Confirmatory Factor Analysis, χ2/sd: Chi-Square / Degrees of Freedom, RMSEA: Root Mean Square Error of Approximation, CFI: Comparative Fit Index, GFI: Goodness of Fit Index, IFI: Incremental Fit Index, TLI: Tucker-Lewis Index, SRMR: Standardized Root Mean Square Residual

When the correlation analysis between the total scores of the scale was examined, the MMAS-8 was a statistically significant positive correlation with each other, with a high correlation with SEAMS (r=0.607; p<0.001), with

General Self-Proficiency Scale (r=0.349; p<0.001), and weak positive correlation. The General Self-Proficiency Scale and SEAMS had a statistically significant medium-positive correlation with each other (r=0.422; p<0.001) (**Table 6**).

**Table 6. Correlation Table between Scale Total scores**

| | MMAS-8 total score (r) | SEAMS total score (r) | General- self-proficiency scale total score (r) |
|---|---|---|---|
| MMAS-8 total score | | | |
| SEAMS total score | 0.607** | | |
| General- self-proficiency scale total score | 0.349** | 0.422** | |

MMAS-8: Morisky-8 medication adherence scale, **Pearson Correlation Analysis, **p<0.001

The validity analysis method with similar simultaneous scales as the criteria-dependent validity method is used, and Morisky-8 medication adherence scale has been used for this method. In addition, the overall General Self-Proficiency scale and individual self-sufficiency were tested, and the treatment harmonization was evaluated together.

A high level and statistically significant correlation were found in the Pearson correlation analysis between MMAS-8 and SEAMS (r=0.607; p<0.001) (**Table 6**).

The critical test of the difference between the two measurements evaluated whether there is a meaningful difference between the two score means. There was no significant difference between the two measurements (p=0.235). And also a Statistically significant high-positive correlation between SEAMS applied twice at different times (r= 0.702; p<0.001)
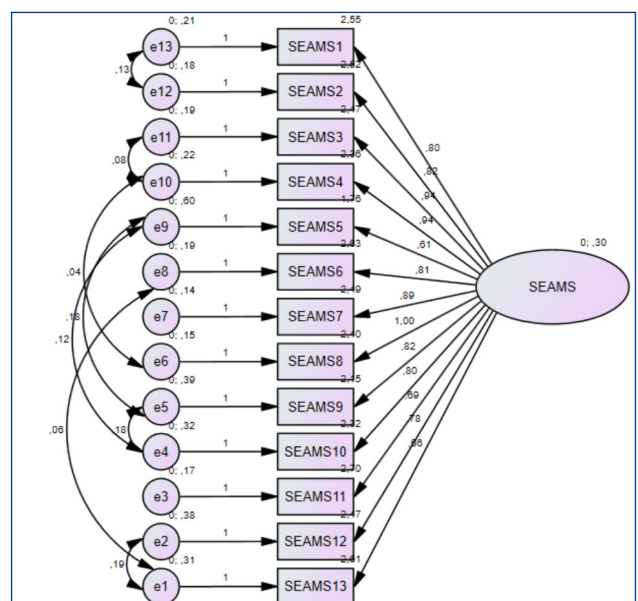


**Figure 3.** CFA results of T-SEAMS.

## DISCUSSION

In our study, explanatory factor analysis was performed to assess the structural validity of the SEAMS scale. The Turkish version of the scale has a value of 0.887 (very good). The results of the Barlett Test, which were made to test the homogeneity of the prevalence of the dispersions, were determined as $x2=3316.15$, $p<0.001$, and this result was evaluated as an advanced significance. In the validity reliability study of the SEAMS Thai version, the scale was found to have a KMO value of 0.67, and Barlett Test results were $x2=273,016$, $p \leq 0.001$ (96), and in the SEAMS Chinese version, the KMO value was 0.828, Barlett Test $x2=2.055.683$, $p<0.001$ (21). In the SEAMS study performed on elderly Chinese patients, the value of KMO was 0.787, the Barlett Test $p <0.01$ (29).

The validity analysis method with similar simultaneous scales as the criteria-dependent validity method is used, and Morisky-8 medication adherence scale has been used for this method. The Pearson moments multiplication correlation between MMAS-8 and T-SEAMS found a high and statistically significant correlation in the correlation analysis ($r=0.607$; $p<0.001$). Original SEAMS was tested by Risser and others in patients with chronic disease and reduced from 21-item initial to 13-item. In the same study, the Morisky medication adherence scale was used the same way as our work, and a strong relationship with the T-SEAMS was detected ($r=0.51$; $p=0.001$) (19).

In our study, T-SEAMS average points of matter range from 1.76 to 2.70, while the average total score was 31.42 and the standard deviation was 6.31. In the original SEAMS validity reliability study by Risser and others, the average points of the article were between 1.91 and 2.91 (19). In the Arabic version of SEAMS, the average score of the article was between 2.24 and 2.74, while the average total score was 32.36 and the standard deviation was 5.31 (22). In the Chinese version of SEAMS, the average article scores range from 1.55 to 2.34 (21), while the average score for each article was between 2.14 and 2.97 (23) in the study of older Chinese patients.

In our study, when the substance of the T-SEAMS scale was removed, the Cronbach's alpha coefficient and corrected material total correlation of the questions were looked at, the Cronbach's alpha was found to be 0.916, and the scale was considered very reliable. Our study found that the total correlation of corrected material varies between 0.446 and 0.747. In the original SEAMS, the Cronbach's alpha internal consistency test of 0.89 was detected, the scale was found to be valid and reliable, and the total correlation of the substance was determined to vary between 0.36 and 0.67 (19). In the study where the validity and reliability of the SEAMS Taiwan version were performed, the Cronbach's alpha internal consistency test was 0.931, and the Cronbach's alpha values calculated if each item on the scale was removed changed between 0.922 and 0.929, and the total correlation coefficient of the substance changed between 0.584 and 0.781 (20). In the Arabic version of SEAMS, the substance-total correlation coefficient varies between 0.48 and 0.82, while the overall scale has a Cronbach's alpha value of 0.88, pointing to good internal consistency (22). In the validity reliability study of the SEAMS Chinese version, the Cronbach alpha value is 0.915 and the corrected material total correlation varies between 0.362 and 0.672, 12. It was determined that Cronbach's alpha value would not increase by erasing any material on the scale, where all materials except the article showed a medium-strong correlation with the total scale (21). Another study on Chinese patients found that the Cronbach's alpha value of 0.768 for the whole scale was found to vary between 0.715 and 0.799 of the Cronbach's alpha values calculated if each substance on the scale was removed (29), and the Cronbach's alpha value was 0.90 in the validity reliability study of the SEAMS Thai version (30).

In our study, when the results of the test and retest of the SEAMS scale were compared to the descriptive statistics and the significant test of the difference between the two cones, there was no significant difference between the two measures ($p=0,235$). According to the answers from the 18 participants, the test-retest reliability of the original SEAMS scale of 21 points was found moderately ($r=0.62$; $p<0.001$) (19). In the Chinese version of SEAMS, test-retest reliability is slightly higher than the original scale ($r=0.642$; $p<0.001$) and (21), test-retest reliability is $r=0.784$; $p<0.001$ (29) for another study on Chinese patients.

The limitation of our study was that some people had left some parts of the scale and question form blank due to the application of surveys within a limited period has caused these surveys not to be evaluated.

The number of patients collected due to the decrease in the number of patients in the pandemic process has remained limited.

## CONCLUSION

The Turkish Self-Efficacy for appropriate Medication use Scale (T-SEAMS) has been adapted in Turkish as the Self-Competency Scale to match the Pharmaceutical Treatment. The adapted scale has been determined to be valid and reliable. In our study, the method of validity analysis with similar simultaneous scales and the Morisky-medication adherence scale were used. In addition, the General Self-Proficiency Scale and the individual's self-sufficiency were tested, and the treatment harmonization was evaluated. It was found that the single factor explained 51.48% of the total variance. The internal consistency analysis determined that the Cronbach's alpha values calculated if each item on the scale was removed changed between 0.905 and 0.912 and that total internal consistency was high (Cronbach alpha=0.916).

As s result, this scale, validated in Turkish, can be used to determine the medication compliance status of people with chronic diseases. The medications to be taken by people can be decided according to the determined situation.

## ETHICAL DECLARATIONS

**Ethics Committee Approval:** The dates 04.01.2021 and 72867572-050.01.04-677 have been approved by the Ethics Board of Clinical Studies at the Süleyman Demirel University Faculty of Medicine.

**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.

## REFERENCES

1. World Health Organisation (WHO). Noncommunicable Diseases Country Profiles 2018. Accessed: July 18, 2022:https://www.who.int/publications/i/item/9789241514620.

2. Reuben DB. Better care for older people with chronic diseases: an emerging vision. Jama 2007;298 (22):2673-4.

3. Fried TR, Tinetti ME, Iannone L. Primary care clinicians' experiences with treatment decision making for older persons with multiple conditions. Arch Intern Med 2011;171 (1):75-80.

4. Reuben DB, Tinetti ME. Goal-oriented patient care--an alternative health outcomes paradigm. N Engl J Med 2012;366 (9):777-9.

5. Robben SH, Perry M, Olde Rikkert MG, Heinen MM, Melis RJ. Care-related goals of community-dwelling frail older adults. J Am Geriatr Soc 2011;59 (8):1552-4.

6. Ferris R, Blaum C, Kiwak E, et al. Perspectives of Patients, Clinicians, and Health System Leaders on Changes Needed to Improve the Health Care and Outcomes of Older Adults With Multiple Chronic Conditions. J Aging Health 2018;30 (5):778-99.

7. Rothman AA, Wagner EH. Chronic illness management:what is the role of primary care? Ann Intern Med 2003;138 (3):256-61.

8. Türkiye Halk Sağlığı Kurumu. Türkiye Kronik Hastaliklar Ve Risk Faktörleri Sıklığı Çalışması (2013) Accessed:July 18, 2022:https://hsgm.saglik.gov.tr/depo/birimler/kronik-hastaliklar-engelli-db/hastaliklar/kronik_havayolu/raporlar/KRONIK_ARASTIRMA_2011_TR.pdf.

9. Nunnally JCBI. Psychometric Theory, 3rd edn. McGraw-Hill NY, editor1994.

10. Hair JFJ, Anderson RE, Tatham RL, Black WC. Englewood Cliffs. Multivariate Data Analysis, . edn. t, editor. Prentice-Hall, Inc.1998.

11. Gonzalez R, Griffin D. Testing parameters in structural equation modeling:every "one" matters. Psychol Methods 2001;6(3):258-69.

12. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. Med Care 1986;24 (1):67-74.

13. Plakas S, Mastrogiannis D, Mantzorou M, et al. Validation of the 8-item Morisky Medication Adherence Scale in chronically ill ambulatory patients in rural Greece. Open J Nurs 2016;6 (03):158.

14. de Oliveira-Filho AD, Morisky DE, Neves SJ, Costa FA, de Lyra DP, Jr. The 8-item Morisky Medication Adherence Scale: validation of a Brazilian-Portuguese version in hypertensive adults. Res Social Adm Pharm 2014;10 (3):554-61.

15. Oğuzülgen İK, Köktürk N, Işıkdoğan Z, . Astım ve Kronik Obstrüktif Akciğer Hastalarında Morisky 8-Maddeli İlaca Uyum Anketinin (MMAS-8) Türkçe Geçerliliğinin Kanıtlanması Çalışması.. Tuberküloz Toraks dergisi 2014;62 (2):101-7.

16. Hacıhasanoğlu Aşılar R, Gözüm S, Çapık C, Morisky DE. Reliability and validity of the Turkish form of the eight-item Morisky medication adherence scale in hypertensive patients. Anadolu Kardiyol Derg 2014;14 (8):692-700.

17. Küçük E, Yapar K. Tip II diyabetli hastalarda sağlık algısı, sağlıkla ilgili davranışlar ve ilaç tedavisine uyum:Türkiye'nin Karadeniz Bölgesi'nde bir çalışma. TAF Prevent Med Bull 2016;15 (4).

18. Lee WY, Ahn J, Kim JH, Hong YP, Hong SK, Kim YT, et al. Reliability and validity of a self-reported measure of medication adherence in patients with type 2 diabetes mellitus in Korea. J Int Med Res 2013;41 (4):1098-110.

19. Risser J, Jacobson TA, Kripalani S. Development and psychometric evaluation of the Self-efficacy for Appropriate Medication Use Scale (SEAMS) in low-literacy patients with chronic disease. J Nurs Meas 2007;15 (3):203-19.

20. Chen PT, Wang TJ. Translation and Validation of the Taiwanese Version of the Self-Efficacy for Appropriate Medication Use Scale 2017 (7):28-38.

21. Dong XF, Liu YJ, Wang AX, Lv PH. Psychometric properties of the Chinese version of the Self-Efficacy for Appropriate Medication Use Scale in patients with stroke. Patient Prefer Adherence 2016;10:321-7.

22. Alhazzani H, AlAmmari G, AlRajhi N, et al. Validation of an Arabic Version of the Self-Efficacy for Appropriate Medication Use Scale. Int J Environ Res Public Health 2021;18 (22):1232-9.

23. Pedrosa RB, Rodrigues RC. Adaptation and evaluation of the measurement properties of the Brazilian version of the Self-efficacy for Appropriate Medication Adherence Scale. Rev Lat Am Enfermagem 2016;24:e2692.

24. Scholz U, Doña BG, Sud S, Schwarzer R. Is general self-efficacy a universal construct? Psychometric findings from 25 countries. European journal of psychological assessment 2002;18 (3):242.

25. Aypay A. Genel öz yeterlik ölçeği'nin (GÖYÖ) Türkçe'ye uyarlama çalışması. İnönü Üniversitesi Eğitim Fakültesi Derg 2010;11 (2):113-32.

26. Guillemin F, Bombardier C, Beaton D. Cross-cultural adaptation of health-related quality of life measures:literature review and proposed guidelines. J Clin Epidemiol 1993;46 (12):1417-32.

27. Portney LG, Watkins MP. Foundations of clinical research:applications to practice:Pearson/Prentice Hall Upper Saddle River, NJ;2009.

28. Alpar C. Spor Sağlık Ve Eğitim Bilimlerinden Örneklerle uygulamali istatistik ve geçerlik güvenirlik 2016.

29. Wu J, Tao Z, Song Z, et al. Validation and psychometric properties of the self-efficacy for Appropriate Medication Use Scale in elderly Chinese patients. Int J Clin Pharm 2021;43 (3):586-94.

30. Polsook R, Aungsuroch Y, Thanasilp S, Duffy JR. Validity and Reliability of Thai Version of Questionnaire Measuring Self-efficacy for Appropriate Medication Use Scale among Thai with post-myocardial infarction. Songklanakarin Journal of Science & Technology 2014;36 (4).