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The Validation and Reliability Study of Turkish Version of Revised Urinary Incontinence Scale

Revised Urinary Incontinence Scale'in Türkçe Geçerlilik ve Güvenilirlik Çalışması

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ABSTRACT

Aim: This study aims to verify the validity and reliability of Turkish Version of Revised Urinary Incontinence Scale (RUIS).

Materials and Methods: The scale was translated from English into Turkish by three academicians. The first Turkish version of the scale was created by combining the translated texts. This version was translated back into English, and the authors examined language compatibility. The content validity of the scale was examined through the Davis method. The item content validity indices were in the range of 0.78-1, and the scale content validity indices was determined as 0.89. Fifty-six volunteers (83.9% female, 16.1% male) with a mean age of 59.2±14 years were applied the Turkish versions of RUIS, International Consultation on Incontinence Questionnaire Short Form and Urogenital Distress Inventory.

Results: The Cronbach alpha coefficient was calculated as 0.810. There was no floor and ceiling effect on the scale. The Kaiser-Meyer-Olkin value of the scale was 0.762, the Bartlett sphericity test chi-square value was 94.583, the p value was 0.0001, and the 'anti-image' correlation values were in the range of 0.709-0.884. The explained variance rate of the scale which preserved its single sub-dimensional structure was calculated as 57.943%, and the eigenvalue was 2.897. We determined that the Scale-Turkish version had an excellent ($r>0.80$, $p<0.05$) agreement with the other two measurement tools. We determined that the scale met the model goodness of fit values in confirmatory factor analyses.

Conclusion: RUIS was adapted to the Turkish language, its validity and reliability were ensured, and it was presented to researchers.

Keywords: Urinary incontinence, scale, Turkish language, validity, reliability

ÖZ

Amaç: Bu çalışmanın amacı, Revised Urinary Incontinence Scale'in (RUIS) Türkçe geçerliliğini ve güvenilirliğini sağlamaktır.

Gereç ve Yöntem: Ölçek, İngilizceden Türkçeye üç akademisyen tarafından çevrildi. Çeviri metinleri, birleştirilerek ölçeğin ilk Türkçe versiyonu oluşturuldu. Bu versiyon, ölçeğin orijinal dili olan İngilizceye tekrar çevrilerek dil uyumu incelendi. Ölçeğin kapsam geçerliliği, Davis yöntemi ile irdelendi. Madde kapsam geçerlilik indeksleri (KGİ) 0,78-1 aralığında, ölçek KGİ ise 0,89 olarak belirlendi. Yaş ortalaması 59,2±14 yıl olan 56 gönüllüye (%83,9 kadın, %16,1 erkek) RUIS, International Consultation on Incontinence Questionnaire Short Form ve Urogenital Distress Inventory'nin Türkçe versiyonları uygulandı.

Bulgular: Cronbach alfa katsayısı 0,810 olarak hesaplandı. Ölçekte taban ve tavan etkisi oluşmadı. Ölçeğin Kaiser-Meyer-Olkin değeri 0,762, Bartlett küresellik testi ki-kare değeri 94,583, p değeri 0,0001 ve 'anti-image' korelasyon değerleri 0,709-0,884 aralığındaydı. Tek alt boyutlu yapısını koruyan ölçeğin açıklanan varyans oranı %57,943 ve öz değeri 2,897 olarak hesaplandı. Ölçeğin Türkçe versiyonunun, diğer iki ölçüm aracı ile mükemmel düzeyde ($r>0,80$; $p<0,05$) uyum gösterdiği tespit edildi. Ölçeğin doğrulayıcı faktör analizlerinde de model uyum iyiliği değerlerini karşıladığı görüldü.

Sonuç: RUIS'in Türkçeye uyarlandığı, geçerliliğinin, güvenilirliğinin sağlandığı görüldü ve araştırmacıların kullanımına sunuldu.

Anahtar Kelimeler: İdrar kaçırma, ölçek, Türkçe, geçerlilik, güvenilirlik

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INTRODUCTION

Urinary incontinence (UI) is a health problem that can be seen in all age groups worldwide. UI was defined as 'the complaint of any involuntary leakage of urine' by the International Continence Society (ICS) in 2002, and this terminology was adopted in the joint statement of ICS and the International Urogynecology Association (IUGA) in 2010[1,2]. Current terminology studies on UI continue increasingly[3]. While the general prevalence of UI, which has many subtypes, mainly stress, urgency, and mixed type, varies between 25% and 45% in women and between 1% and 39% in men, its incidence increases with age[4].

Rates such as 37.3% in the Middle East and North Africa, 32.2% in Europe and Central Asia, 14.2% in South Asia and 28.8% in Latin America show that UI varies according to the ethnicity, geography, and development level of the countries[5]. In our country, the prevalence is between 14.6% and 49.5%[6-9]. The fact that the prevalence rates were quite different among studies was attributed to the diversity in the questionnaires used by the authors[5].

When evaluating UI, it is necessary to compare before/after treatment or analyze patient complaints in a standard way in clinical studies. During these evaluations, inquiry forms are used to quantify the data. The questionnaire should be easily understandable and short and contain essential questions about the disease.

We conducted the validity and reliability study of the Turkish version (RUIS-TR), considering that the Revised Urinary Incontinence Scale (RUIS) is adequately equipped for UI.

MATERIALS AND METHODS

After obtaining permission via e-mail from Sansoni et al.[10], who developed the RUIS, and approval of the Süleyman Demirel University Local Ethics Committee (decision dated: 05.05.2021 and number: 11/203), the research began. An informed consent form was obtained from each volunteer participating in the study.

RUIS was translated from its original language, English, into Turkish by three academicians (two field experts and one non-field expert). During the translation, attention was paid to the use of the daily Turkish language structure that our society could easily understand without moving away from the meaning expressed in the original language.

The three translated texts of the scale, which were translated independently of each other, were created as the first Turkish version of the scale after the consensus meeting held by the three academicians who did the translations. This version was translated back into its original language by a native English translator, and language compatibility was examined and evaluated in terms of semantic shift. It was agreed that the content and validity of the last version of the scale were suitable for evaluation.

CONTENT VALIDITY

The clarity of the first Turkish version of the scale was evaluated using the Davis method on ten patients (eight women, two men) who applied to our hospital with the complaint of UI. The clarity of the first Turkish version of the scale was examined with a four-point Likert-type form. The scores given to the form were used to calculate the item content validity indices and the scale content validity index. While the critical value of the item content validity index was 0.78, the critical value of the scale content validity index was accepted as 0.80[11,12].

Item content validity indices were calculated as 0.89 for item 1, 1.00 for items 2 and 4, and 0.78 for items 3 and 5. The content validity index of the scale was determined as 0.89. These values indicated that the scale provided content validity by exceeding the recommended critical values. With the qualitative feedback given to the form, the Turkish version of the scale to be used in the pilot scheme was made ready.

PILOT SCHEME

To evaluate the Turkish validity and reliability of the scale, it was aimed to reach individuals with UI complaints at least ten times higher than the number of items[13].

Patients over the age of 18 years, who applied to the urology outpatient clinic with the complaint of UI, were included in the study on a voluntary basis. Exclusion criteria of the study were; pregnancy, urinary tract infection, symptomatic urinary stone disease, previous history of urethra/prostate/bladder/uterus/vagina or lumbar hernia operation, diabetes mellitus, diuretic drugs, and receiving medical treatment for UI. In addition, patients with physical or mental disabilities who could not fill in the questionnaire on their own were not included in the study.

A total of 56 volunteers, whose 83.9% (n=47) were female and 16.1% (n=9) were male, the mean age was 59.2±14 years, and the body mass index was 26.8±4.9 kg/m^2, who met the inclusion criteria of the study were applied International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF) Turkish version, Urogenital Distress Inventory (UDI-6) Turkish version and RUIS-TR, which is tried to be adapted into Turkish with this study, by using face-to-face interview techniques (Table 1).

Statistical Analysis

The data obtained at the end of the pilot scheme were analyzed with Statistical Package for the Social Sciences v.23 and AMOS v.24 package program. Descriptive statistical analyses, explanatory and confirmatory factor analysis, Cronbach's alpha analysis, quarterly difference analysis, and correlation analysis of fit were performed on the data. Results are presented as frequency, percentage, and mean ± standard deviation.

RESULTS

In our study, the mean score from RUIS-TR was 8.71±4.11, and the median and mode values were 8 points. The 25% percentile score of the sample was 6, the 50% percentile score was 8, and the 75% percentile score was 12.

In the Turkish version of the scale, the Cronbach alpha coefficient was calculated as 0.810, and when it was removed from the scale, the item that caused an increase in the Cronbach alpha coefficient was not detected. Thus, the scale was found to have high reliability (Cronbach's alpha coefficient=0.80-1.00) (Table 2).

It was observed that the item-total correlation coefficients in the scale were greater than 0.25, the index of distinctiviness values were positive, and the p value obtained in the difference test between the lower and upper 27% groups was determined as 0.0001. It was determined that the rate of those who got 0 points, which is the lowest score that can be obtained from RUIS-TR, was 5.4% (n=3) and there was no floor effect. The rate of those who got 16 points, which is the highest score that can be obtained, was 1.8% (n=1) and there was no ceiling effect.

The Kaiser-Meyer-Olkin value of the scale was 0.762, the Bartlett Sphericity test chi-square value was 94.583, and the p value was 0.0001, the 'anti-image' correlation values were in the range of 0.709-0.884. In the light of these results, the analyses were continued using the principal components method. The explained variance rate of RUIS-TR, which preserves its single sub-dimensional structure, was calculated as 57.943% and its eigenvalue as 2.897.

Within the scope of convergent validity of RUIS-TR, its correlation with Turkish versions of ICIQ-SF and UDI-6

Table 1. 'Revised Urinary Incontinence Scale' adapted into Turkish

Revised Urinary Incontinence Scale-Türkçe versiyon

İdrar kaçırma şikayetinizle ilgili olarak son 4 haftayı düşündüğünüzde aşağıdaki kutucuklardan kendiniz için en uygun olanı işaretleyiniz.

Aşağıdaki durum başınıza geldi mi, öyle ise bu durum sizi ne kadar rahatsız etti?:

1. Ani sıkışma hissi ile ilişkili olan idrar kaçırma
   - Asla (0)
   - Nadiren (1)
   - Ara sıra (2)
   - Çoğu zaman (3)
2. Fiziksel aktivite, öksürme veya hapşırma ile ilişkili olan idrar kaçırma
   - Asla (0)
   - Nadiren (1)
   - Ara sıra (2)
   - Çoğu zaman (3)
3. Az miktarda idrar kaçırma (damlama)
   - Asla (0)
   - Nadiren (1)
   - Ara sıra (2)
   - Çoğu zaman (3)
4. İdrar kaçırma hangi sıklıkta başınıza gelmektedir?
   - Hiçbir zaman (0)
   - Ayda bir kereden az (1)
   - Ayda birkaç kez (2)
   - Haftada birkaç kez (3)
   - Her gün ve/veya her gece (4)
5. Her seferinde ne kadar miktarda idrar kaçırmaktasınız?
   - Hiç (0)
   - Birkaç damla (1)
   - Hafif sızıntı (2)
   - Çok fazla (3)

was examined. Accordingly, a high level of positive linear relationship was determined between the total score of the RUIS-TR and the other two measurement tools, in which the convergent validity was evaluated, and it was found that it had an excellent concordance (r=0.80-1.00) (Table 3).

It was observed that the scale, whose reliability, structure and fit validity was ensured, also met the model goodness of fit values in confirmatory factor analyses (Figure 1, Table 4).

DISCUSSION

According to the data obtained from the study, it was seen that RUIS-TR was adapted to Turkish, and its validity and reliability was ensured. During the clinical application of the Turkish scale; It is recommended that patients with 0-6 points be classified as 'mild', patients with 7-11 points as 'moderate', and patients with 12-16 points as 'severe' UI.

In the development study of RUIS by Sansoni et al.[10], the total score obtained from the scale was calculated as 10.92±3.33, based on the answers given by patients (86% female and 14% male). Although the gender distribution of the patients participating in the original study was slightly higher (10.92±3.33 points vs. 8.71±4.11), the mean values obtained from the scale were compatible with our study, which is the Turkish version of the scale. During the clinical application of the original scale, the recommended cut-off values were 0-3 points (extremely mild), 4-8 points (mild), 9-12 points (moderate), and 13-16 points (severe)[10]. In the Turkish version of the scale, 0-6 points were considered as mild, 7-11 points as moderate, and 12-16 points as severe. We thought this variation occurred due to the difference in the mean, median, and mode values of the scores given to the scale by the samples in the studies.

The most important indicator of the reliability of the scales is the value of the Cronbach alpha coefficient. In this context, the Cronbach alpha coefficient obtained from the pre-treatment sample group of the original study was 0.73 and the Cronbach alpha coefficient obtained from the post-treatment sample

Table 2. Validity and reliability results of Revised Urinary Incontinence Scale-Turkish version

	RUIS-TR Item 1	RUIS-TR Item 2	RUIS-TR Item 3	RUIS-TR Item 4	RUIS-TR Item 5	RUIS-TR
Mean	1.18	1.73	1.55	2.66	1.59	8.71
Standard deviation	1.15	1.19	0.97	1.24	0.85	4.11
Item-total correlation	0.538	0.584	0.509	0.729	0.675	-
Item discrimination strength index	7.977	10.057	5.675	8.721	6.693	14.165
Factor load	0.705	0.742	0.663	0.864	0.814	-
Cronbach alpha	0.792	0.779	0.798	0.729	0.761	0.810

RUIS-TR: Revised Urinary Incontinence Scale-Turkish version

Table 3. Convergent validity results of Revised Urinary Incontinence Scale-Turkish version

		ICIQ-SF total score	UDI-6 total score
		8.9±5.9	6.8±4.3
RUIS-TR Item 1	r	0.534**	0.793**
	p	0.0001	0.0001
RUIS-TR Item 2	r	0.656**	0.799**
	p	0.0001	0.0001
RUIS-TR Item 3	r	0.511**	0.777**
	p	0.0001	0.0001
RUIS-TR Item 4	r	0.788**	0.680**
	p	0.0001	0.0001
RUIS-TR Item 5	r	0.753**	0.573**
	p	0.0001	0.001
RUIS-TR total score	r	0.854**	0.866**
	p	0.0001	0.0001

**: p value is significant at the level of 0.01.

RUIS-TR: Revised Urinary Incontinence Scale-Turkish version, ICIQ-SF: International Consultation on Incontinence Questionnaire Short Form-Turkish version, UDI-6: Urogenital Distress Inventory-Turkish version

group was 0.90, and the scale was found reliable[10]. In the Turkish version of the scale, this value was calculated as 0.810, and it was observed that RUIS-TR provided high reliability.

The condition for the applicability of factor analysis during the analyses performed in scale development and adaptation studies was Kaiser-Meyer-Olkin value above 0.60 and the Bartlett Sphericity test chi-square test p value less than 0.05[13]. The applicability condition for factor analysis was met in the original study and in this study, which is an adaptation study into Turkish. In this context, while the factor load explained in the original study was 49%, the eigenvalue was 2.43, and the factor loads of the items were in the range of 0.64-0.80, these values were found to be 57.943, 2.897 and the range of 0.663-0.864, respectively, in the Turkish version of the scale, which showed the validity of RUIS-TR.

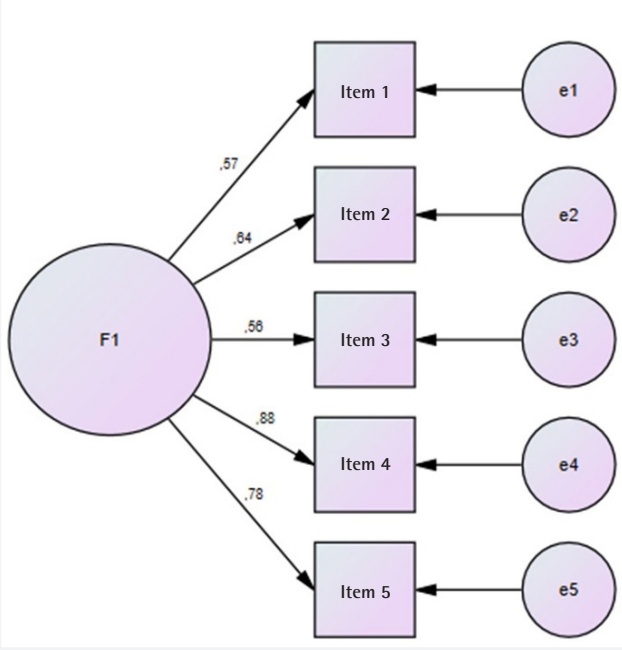

Figure 1. Confirmatory factor analysis diagram of the Revised Urinary Incontinence Scale-Turkish version

Table 4. Confirmatory factor analysis results of the Revised Urinary Incontinence Scale-Turkish version

Model fit indices	Value in RUIS-TR
χ^2/df	1.364[i]
RMSEA	0.081[k]
SRMR	0.043[i]
CFI	0.980[i]
GFI	0.958[i]
AGFI	0.875[k]
IFI	0.981[i]
TLI	0.959[i]

[i]: good fit, [k]: Acceptable fit.

RUIS-TR: Revised Urinary Incontinence Scale-Turkish version, RMSEA: Root Mean Square Error of Approximation, SRMR: Standardized Root Mean Squared Residual, CFI: Comparative Fit Index, GFI: Goodness-of-Fit Index, AGFI: Adjusted Goodness-of-Fit Index, IFI: Incremental Fit Index, TLI: Tucker-Lewis Index

In the original study, its correlation coefficient with the UDI-6, in which the concordance validity was evaluated, was 0.76 ($p<0.01$), and its correlation coefficient with the ICIQ-SF was 0.74 ($p<0.01$)[10]. In our study, both correlation coefficients remained above 0.80 with the Turkish version of UDI-6 and ICIQ-SF, and RUIS-TR showed excellent concordance with other scales.

In scale development and adaptation studies, it is desired that the floor and ceiling effects in the sample be below 15%[14]. In this context, while the rate of those who got a base score was 0.5% in the original study, the rate of those who got a ceiling score was 5.6%[10]. In our study, these rates were 5.4% and 1.8%, respectively, below the 15% limit value desired to be applied in the literature.

When adapting the original scales to a different culture and language, confirmatory factor analysis is recommended as well as explanatory factor analysis and reliability analysis[15]. In this study, confirmatory factor analysis was applied after the explanatory factor analysis, and it was observed that the scale met the model goodness of fit values.

Study Limitations

The main limitation of our study is its single-center conducted nature. However, it was observed that RUIS-TR was adapted to Turkish, and its validity and reliability were ensured.

CONCLUSION

The use of the internationally standardized RUIS-TR scale form in the evaluation of patients who apply with UI complaints will strengthen the clinicians' armamentarium both in practice and in future studies. At the same time, we believe that analyzing the obtained data in a common ground will prevent conceptual confusion in diagnosis and treatment.

Ethics

Ethics Committee Approval: The study were approved by the Süleyman Demirel University of Local Ethics Committee (decision dated: 05.05.2021 and numbered: 11/203).

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: S.A.Ö., O.E., Concept: S.A.Ö., O.E., Design: O.E., S.E., Data Collection or Processing: S.A.Ö., Analysis or Interpretation: S.A.Ö., S.E., Literature Search: S.A.Ö., S.E., Writing: S.A.Ö., O.E., S.E.

Conflict of Interest: No conflict of interest was declared by the authors.

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