Turk J Dermatol 2017;11:179-83 • DOI: 10.4274/tdd.3400 **179**

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Reliability and Validity of the Turkish Version of Patient and Observer Scar Assessment Scale in Patients with Burns

Hasta ve Gözlemci Skar Değerlendirme Ölçeği'nin Türk Toplumu için Yanık Hastalarında Geçerlik ve Güvenirliğinin Değerlendirilmesi

Abstract

Objective: To evaluation reliability and validity of the Turkish version of Patient and Observer Scar Assessment Scale (POSAS) in patients with burns.
Methods: This is a methodologically study. Data were collected using POSAS, survey form and plexiglas. Patient Scar Assessment Scale (PSAS) was completed by patients (n=53) and Observer Scar Assessment Scale (OSAS) was completed by two observers separately. The test-retest was measured applying the scales in 25 patients after two weeks. Data were analyzed by Kruskal-Wallis and Mann-Whitney U test. Content validity was determined using Kaiser-Meyer-Olkin, Barlett's test and structure validity was performed by explanatory factor analysis (EFA) and confirmatory factor analysis (CFA); reliability was evaluated using internal consistency, Cronbach's alpha and intraclass correlation coefficient (ICC).
Results: Factor weights were in appropriate range according to EFA, 6 items single factor structure of the original scale was valid and had high consistency index according to CFA, ICC between the 7th item and the total points was proportional, inner consistency was highly reliable (PSAS α=0.992, OSAS α=0.993), consistency between the observers was high (α=0.952, r=0.909). It was determined OSAS scores increased as the burn degree increased ($p<0.05$).
Conclusion: POSAS was determined to be a valid and reliable scale in patients with burns in the Turkish society.
Keywords: Burns, scar, scale, reliability and validity, patients, observer

Öz

Amaç: Hasta ve Gözlemci Skar Değerlendirme Ölçeği'nin (HGSDÖ) Türkçe formunun yanık hastalarında geçerlik ve güvenirliğini değerlendirmek amacıyla yapılmıştır.
Yöntemler: Metodolojik tipte bir çalışmadır. Çalışmanın verileri HGSDÖ, anket formu ve pleksiglas kullanılarak toplanmıştır. Hasta Skar Değerlendirme Ölçeği (HSDÖ) hastalar tarafından (n=53), Gözlemci Skar Değerlendirme Ölçeği (GSDÖ) birbirinden bağımsız iki gözlemci tarafından doldurulmuştur. İki hafta sonra ölçekler 25 hastaya tekrar uygulanmıştır. Veriler Kruskal-Wallis ve Mann-Whitney U testi ile analiz edilmiştir. Ölçeğin kapsam geçerliğinde Kaiser-Meyer-Olkin ve Barlett testi, yapı geçerliğinde Açıklayıcı Faktör Analizi (AFA) ve Doğrulayıcı Faktör Analizi (DFA), güvenirliğin değerlendirilmesinde iç tutarlılık, Cronbach's alpha ve intraclass correlation coefficient (ICC) ile bakılmıştır. HGSDÖ'de yer alan 7. madde, orijinal ölçekte olduğu gibi, ölçeğin puanı dışında tutularak değerlendirilmiştir.
Bulgular: AFA'ya göre ölçeğin faktör yüklerinin uygun aralıkta, DFA'ya göre orijinal ölçeğin 6 madde tek faktörlü yapısının geçerli ve uyum indekslerinin yüksek, ölçeğin toplam puanı ile 7. madde arasında ICC'nin doğru orantılı, iç tutarlılığın yüksek derecede güvenilir (HSDÖ α=0,992, GSDÖ α=0,993), gözlemciler arasında tutarlılığın yüksek (α=0,952, r=0,909) olduğu saptanmıştır. Hastaların yanıklarının derecesi arttığında, GSDÖ puanının anlamlı derecede arttığı belirlenmiştir ($p<0,05$).
Sonuç: HGSDÖ'nün Türk toplumu için yanık hastalarında geçerli ve güvenilir bir ölçek olduğu belirlenmiştir.
Anahtar kelimeler: Yanık, skar, ölçek, güvenirlik ve geçerlik, hasta, gözlemci

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Submitted/Geliş Tarihi: 23.06.2017
Accepted/Kabul Tarihi: 07.09.2017

25-27 Mayıs 2017, Bodrum/ Türkiye'de yapılan, 4. Temel Hemşirelik Bakımı Kongresi'nde "Yanık Hastalarında Skar Değerlendirmesi ve Etkileyen Faktörler" başlığı ile bu çalışmanın bazı bilgileri poster bildirisi olarak sunulmuştur.

Introduction

Burn is widely extensive trauma which affects all organism, can cause limb amputation and with formed physiopathology determines prognosis (1-3).

Collagen accumulation in the recovery process of burn injury forms scar tissue (4-6). The presence of scar can be worrying in terms of body image for patients with burns and it can cause poor psychological effect in social life. For this reason, patient's evaluation for own scar and knowing the recovery stage of the scar is quite important for nurses and other healthcare personnel who take part in treatment and care of patients with scar (7,8).

There are many scales which are used for scar evaluation (8-12). One of them is the Patient and Observer Scar Assessment Scale (POSAS) which is quite important, because it gives opportunity to patient and observer to evaluate the scar separately.

The validity and reliability of POSAS is made from Draaijers et al. (7) for the first time (1.0 version), afterwards, Van de Kar et al. (10), with adding one new item to observer scale and making some page edits, perform reliability and validity. In Turkey, there is no valid and reliable measurement tool using for scar evaluation. According to previous researches (2,7,8,10,13,14), it is indicated that apart from observers, POSAS reveals thoughts of patients about itching in scar area and scar thickness and condition of affecting from their scar. Based on these results, it is thought that POSAS can be advisor for health care personnel evaluating scar inclusively and planning treatment and care of patient and it can be used as reliable and valid measurement tool in clinical researches. For this reason, our research is made for evaluation of reliability and validity of POSAS for Turkish society.

Methods

For the implementation of POSAS in Turkey, written permission was obtained from Lieneke Draaijers firstly, after that written permission was obtained from Başkent University Ankara Hospital Clinical Researches Ethics Committee (Date: 17/7/2013; Decision number: 13/77; Project number: KA13/168), and hospital where research was made and patients who participate to study.

The sample of the study consist patients who fit sample selection criteria (between the ages of 18 and 65, literate, no mental and psychological illness, have second or third degree burn scar, all of burn scars are epithelized, at least three weeks at most 1 year after injury, scar with at least 3x3 cm, scar localization visible for patient and approve to participate study) from among 53 of 316 patients who apply burn treatment unit of a university hospital for a year. In these 53 patients, the most visible scar area is evaluated. About 62.3% of participants are women, mean age was X=39.75±1.76 years.

In this research, sociodemographic characteristics form (it includes 31 items) and POSAS are used. POSAS comprises of two different scales which are the Patient Scar Assessment Scale (PSAS) and the Observer Scar Assessment Scale (OSAS). PSAS is formed 6 items that patients fill questions by evaluating own scars (pain, pruritus, color, relief, thickness, pliability), OSAS is formed by 6 items that observers fill these items by evaluating scar (vascularization, pigmentation, thickness, surface roughness, pliability, and surface area). Each item has Likert-type scale from 1 point to 10 points. One indicates normal skin, 10 indicates the worst scar evaluation. The possible minimum score is 6 which indicates normal skin, the possible maximum score is 60 indicates the imaginable worst scar.

In the POSAS, there is 7th item which evaluates overall opinion about scar. This item is evaluated from 1 to 10 points and 10 points indicates the worst scar which can be thought.

In the research, to evaluate the vascularization and pigmentation of material used in the OSAS, the suitability proven by the conducted researches (10,15), 10x4 cm long and 3 mm thick plexiglas was used.

To provide the language validity of the scale was carried out three specialists who are expert in burn cases and good at English. This translation which was obtained back translated from Turkish to English by four English linguistic experts and it is not found difference between original version (Content Validity Index >0.99) (Appendix 1, Appendix 2).

The study was made between August 2013 and February 2014. Patients who were determined from patient files were called up for clinical check, asked for filling sociodemographic characteristics form and scoring PSAS from evaluating own scars.

The same scar tissue was evaluated from two observers (MSc nurse and physician who work in the burn unit) in turn with using same criteria but independently scoring OSAS. POSAS were retested after 2 weeks to 47.2% of patients (25 patients).

Data were obtained from research was evaluated with the Statistical Package for Social Science. In this study, the differences between groups were examined. According to this, Mann-Whitney U test was used for two groups and non-normally distrubuted variables (the degree of burn, total burnt surface area, period after injury, frequency of wound care, sex). Kruskal-Wallis was used for more than two groups and non-normally distributed variables (age).

Content validity was determined using Kaiser-Meyer-Olkin (KMO) and Barlett test. In the evaluation of POSAS's construct validity, explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) were applied. The seventh item of POSAS was evaluated apart from total point of scale like original version of scale. The 7th item was analyzed with Spearman's rho test for providing compares total point obtained from every participant (16). With using Cronbach's Alpha, POSAS's internal consistency was tested. Inter-observer agreement was evaluated with intraclass correlation coefficient (ICC) (17,18).

Results

The features of burn scars from patients are seen in Table 1. Total average scores which obtained to scale are calculated that PSAS X=27.25±14.31 (min. =7, max. =63), OSAS (1) (1st observer) X=15.02±8.60 (min. =7, max. =46), OSAS (2) (2nd observer) X=14.00±7.88 (min. =7, max. =50).

Table 1. The features of burn scars from patients (n=53)

	n	%
The degree of burn		
Second degree	35	66.0
Second and third degree together	15	28.3
Third degree	3	5.7
Total burnt surface (%)		
≤5	41	77.3
6-10	6	11.3
11-15	3	5.7
16-20	3	5.7
Period after injury (month)		
1-4	38	71.7
5-8	4	7.5
9-12	11	20.8
Frequency of wound care (n=51)		
One-two times/day	32	62.7
Three-four times/day	19	37.3

Table 2. Fit indices values of Patient and Observer Scar Assessment Scale and acceptance boundaries of fit indices

Fit indices	OSAS	PSAS	Relative fit indices	Absolute fit indices
χ^2/SD	2.60	1.69	4<X<5	X<3
NNFI	0.92	0.94	0.95≤X≤0.97	0.97≤X≤1
CFI	0.96	0.97	0.95≤X≤0.97	0.97≤X≤1
GFI	0.96	0.97	0.90≤X≤0.95	0.95≤X≤1
NFI	0.93	0.93	0.90≤X≤0.95	0.95≤X≤1

PSAS: Patient Scar Assessment Scale, OSAS: Observer Scar Assessment Scale, NNFI: Non-normed fit index, CFI: Comparative fit index, GFI: Goodness of fit index, NFI: Normed fit index

Construct Validity of Patient and Observer Scar Assessment Scale

According to EFA for determining the construct validity of scale, for PSAS, KMO =0.82, Barlett test x^2=221.03, p<0.05; for OSAS (1), KMO =0.82, Barlett test x^2=221.03, p<0.05 and for OSAS (2), KMO =0.78, Barlett test x^2=205.85, p<0.05 were found and it is significantly higher.

For PSAS and OSAS, the confirmation of single factor and 6 item structure was examined with CFA. POSAS measures single factor with 6 items. The path diagram obtained is shown in Figure 1 and Figure 2.

When taking into consideration statistics using CFA, there is significantly higher rapport between the scale's previous single factor structure and collected data (Table 2).

The study is determined that there is significant positive relationship between total score of POSAS and 7th item score of POSAS (p<0.05) (Table 3).

Table 3. Correlation values between Patient and Observer Scar Assessment Scale scores and 7th item

		PSAS score	OSAS (1) score	OSAS (2) score
PSAS Item 7	**ICC**	0.778		
	p	**0.000**		
	n	53		
OSAS (1) Item 7	**ICC**		0.859	
	p		**0.000**	
	n		53	
OSAS (2) Item 7	**ICC**			0.841
	p			**0.000**
	n			53

PSAS: Patient Scar Assessment Scale, OSAS (1): Scar Assessment Scale Observer 1, OSAS (2): Scar Assessment Scale Observer 2, ICC: Intraclass correlation coefficient, p<0.05

Table 4. The reliability of Patient and Observer Scar Assessment Scale

POSAS score		PSAS retest score	OSAS (1) score	OSAS (1) retest score	OSAS (2) score	OSAS (2) retest score
PSAS score	**r**	0.984	0.303			
	α	0.992				
OSAS (1) score	r			0.985	0.909	
	α			0.993	0.952	
OSAS (2) score	**r**					0.983
	α					0.991

POSAS: Patient and Observer Assessment Scale, PSAS: Patient Scar Assessment Scale, OSAS (1): Scar Assessment Scale Observer 1, OSAS (2): Scar Assessment Scale Observer 2

Reliability of Patient and Observer Scar Assessment Scale

It was found that the consistency between the observers was high (α=0.952, r=0.909) and intraclass correlation (r) was 0.909. It was found that there is high level of consistency between PSAS score and PSAS retest score (α=0.992, r=0.984), considering OSAS score and OSAS retest score is high level of consistency (r=0.985, α=0.993). On the contrary, there is low correlation between PSAS score and OSAS (r=0.303) (Table 4).

Patient and Observer Scar Assessment Scale Scores and Affecting Factors

As the burn degrees of the patients increased, the scale scores increased. This increase is significant (p<0.05) for both observers, but it is not significant for patients (p>0.05). Patients have higher POSAS score who do wound care 3-4 times a day than 1-2 times a day. This difference is significant (p<0.05) only for the first observer. There was no significant difference between the POSAS and total burnt surface area, period after injury, sex and age (p>0.05).

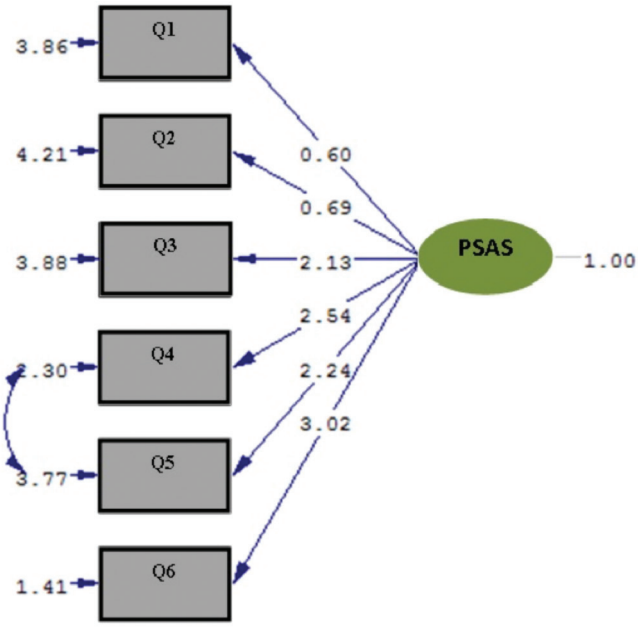

Figure 1. The path diagram of Patient Scar Assessment Scale (Q means to question)

PSAS: Patient Scar Assessment Scale

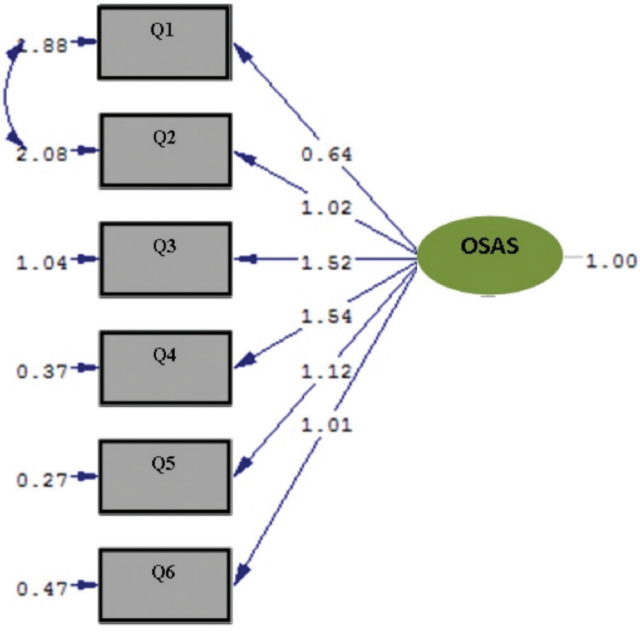

Figure 2. The path diagram of Observer Scar Assessment Scale (Q means to question)

OSAS: Observer Scar Assessment Scale

Discussion

In the studies related reliability and validity of POSAS in literature, for evaluation of construct validity of the scale, parallel scales were used mostly (7,10,12,14,19). In Turkey, it is not found a reliable and valid scar scale which can be used as parallel with POSAS. According to results of factor analysis, it is found that POSAS has validity for Turkish culture and society. Internal consistency for POSAS was found highly reliable (Table 2).

The literatures stated that the POSAS have high validity and reliability and the Cronbach's alpha coefficient have been found between PSAS =0.72-0.98, OSAS =0.69-0.86 (7,9,10,13,14). Our study shows similarity with these studies and it is found that our study's Cronbach's alpha coefficient of POSAS is higher than this studies (PSAS =0.992, OSAS =0.993) (Table 4).

According to test-retest result of POSAS, although Cronbach's alpha values are quite higher, it is found there is a low correlation between PSAS and OSAS (r=0.303). Eskes et al. (20) found that although POSAS is reliable measurement tool, healthcare professionals, caregivers and patients can evaluate scar differently (ICC =0.44, confidence intervals =0.27–0.58). The reason of this situation is patients and observers affect from different features of scar. On the contrary, in the study of Hoogewerf et al. (21) used POSAS and Rosenberg self-esteem scale and they were found that there is high correlation between evaluation of patients and observers about scar. In this study, the reason of this is patients' ability of evaluation of own scar is adequate level. In our study, the higher score of POSAS is, the higher score of 7th item. In the meta-analysis by Van de Kar et al. (10) study shows similarity with our study.

As the degree of the burn increases, the texture of the scar becomes more visible (5,22). In our study, it was determined that OSAS scores increased significantly as the burn grade increased ($p<0.05$). Roh et al. (23) determined that depressive findings increase as burn surface areas increase, patients who have more depressive findings evaluate their scars worse and their quality of life is affected negatively. Tuna and Çetin (24) indicated that the degree of burn increases, the quality of life scores of patients decreases. The results of these two studies support the findings of our study.

Study Limitations

Along with the strengths of this study, Turkish valid and reliable scar scale was not found in the Turkey, so parallel scale analysis could not have performed with the POSAS and than construct validity of the POSAS has been demonstrate with EFA and CFA.

Conclusion

POSAS is reliable and valid for patients with burns in Turkish society. Accordingly, this scale can be used as proper measurement tool for evaluation of scar and additional studies in patients with burns for both patients, nurses and other healthcare personnel.

Ethics

Ethics Committee Approval: For the implementation of POSAS in Turkey, written permission was obtained from Lieneke Draaijers firstly, after that written permission was obtained from Başkent University Ankara Hospital Clinical Researches Ethics Committee (Date: 17/7/2013; Decision number: 13/77; Project number: KA13/168).

Informed Consent: It was taken.

Peer-review: Internally peer-reviewed.

Authorship Contributions

Concept: A.K., E.E.K., Design: A.K., E.E.K., Data Collection or Processing: A.K., C.A., Analysis or Interpretation: A.K., E.E.K., Literature Search: A.K., E.E.K., Writing: A.K., E.E.K.

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

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

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