



Psychometric Properties of the Persian Version of the Staff Observation Aggression Scale-Revised (SOAS-R) in Psychiatric Patients

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ABSTRACT

Introduction: In psychiatric settings, aggressive events frequently occur during therapy. The use of a proper standard scale to register aggression can facilitate the assessment and control of aggression and help reduce its frequency and severity. The aim of this study is to evaluate the validity and reliability of the Staff Observation Aggression Scale—Revised (SOAS-R).

Methods: This psychometric study of the scale was conducted to determine the validity and reliability of the SOAS-R. The validation of the scale was assessed on the basis of 319 aggressive events in the psychiatric wards of the Baqiyatallah and Roozbeh hospitals. Convenience sampling was used for subject selection. Psychometric properties of SOAS-R were studied in two stages. First, the standard scale was translated according to the International Quality of Life Assessment (IQOLA) translation methodology. The face validity, content, and construct validity of the translated version were then determined. The construct validity of the scale was assessed by comparing the known groups.

Results: The internal consistency of the whole scale was 0.99. The intra-class correlation coefficients (ICC) were 0.85–0.99 while kappa coefficient was 0.43 to 0.65 for different aspects of the SOAS-R. The validity of the scale was concurrently assessed by using the Visual Analogue Scale (VAS), with a Spearman-Brown correlation coefficient of 0.90.

Conclusion: These results showed a favourable validity and reliability for the Persian version of the SOAS-R for the assessment of aggressive behaviour in psychiatric patients.

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Introduction

Aggression events in inpatient psychiatry have long been documented.¹ These events include any verbally or physically threatening behaviour related to mental disorders,^{2,3} which occur frequently during therapy. These tend to threaten the safety of the patient and workers, and can lead to the enforcement of compulsory measures such as physical restraining of the patients.³⁻⁶

Previous studies report that 3.0% to 13.6% of inpatients display aggressive behaviour episodes in psychiatric wards.⁷ In one study, 6% of the nurses reported to have been the

victims of patients' aggression over the previous year; 10% of these events involved physical traumas that needed treatment.⁸ In a study conducted in China, 375 cases of aggression were registered among a total of 538 hospitalized people over a period of six months, 96.8% of which were reported to be moderate to severe aggressive behaviour.⁹ The use of self-report questionnaires and observation scales to measure aggressive behaviour in psychiatric settings is recommended. The term aggressive behaviour includes any type of behaviour that is considered physically or psychologically harmful. A literature review shows that most

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observation scales for aggressive behaviour have been used for psychotic inpatients. One type of scale—including the Overt Aggression Scale and the Modified Overt Aggression Scale (OAS, MOAS)—categorizes acts of aggression according to type, such as verbal aggression, physical aggression towards objects, physical aggression towards oneself, and physical aggression towards others. Another type—including Staff Observation of Aggression Scale-Revised (SOAS-R)—views aggressive behaviour as part of a behavioural chain.¹⁰ The SOAS-R is a measure to describe aggressive event incidence and characteristics.¹¹ Due to its simplicity of use, it can monitor a wide range of dangerous behaviours.¹²

The nurses' assessment and registration of patients' behaviours is meant to prevent the increase in aggressive behaviours and create a safer environment with a lower incidence of stressful events.³ Exposure to aggression can lead to severe stress and adverse psychological consequences.¹³ A standard scale to register aggression can facilitate the assessment and control of aggression and help reduce its frequency and severity. The SOAS-R tool is used in different countries.^{3,4,7,9,14-17} Also the Visual Analogue Scale is a suitable and useful scale for the prediction of physical and verbal aggression. It has been established as a valid and reliable scale to help staff detect a level of aggression.¹⁴ There is no specific observation scale in Iranian psychiatric wards to measure aggressive behaviour. Therefore, the aim of the present study is to create the first Persian translation of the SOAS-R and carry out psychometric testing of the validity and reliability of the Persian version, associated with aggressive incidents among adult psychiatric patients, especially in hospital wards.

Materials and methods

This psychometric study of the scale was conducted in the acute psychiatric wards of Baqiyatallah and Roozbeh hospitals in Tehran, Iran. All the psychiatric inpatients were observed by nurses. Out of 981 patients hospitalized in psychiatric wards, 162 showed aggressive behaviours; 319 aggression events

were registered during a period of seven months from June 2014 to January 2015 in the two hospitals. In this study, the data were collected through the demographic information form, SOAS-R, and VAS.

Demographic information form comprises seven questions regarding the demographic characteristics of psychiatric patients, such as age, gender, marital status, education, history of hospitalization and aggression, history of psychiatric medications use and drug abuse, and history of mental disorder. Palmstierna and Wistedt first proposed SOAS in 1987 as a tool for assessing the frequency, nature, and severity of inpatient aggression. They established the scoring system which is now used for measuring the severity of aggressive events. Nijman *et al.*, then redefined the scale's items and introduced the SOAS-R,¹⁸ which includes checklist items about specific aspects of aggressive behaviour such as provocation, means used by patients, target of aggression, consequences for victims, and measures to stop aggression. That occurred—staff members mark the items that they have observed. It was devised to assess verbal and physical aggression against objects, other patients, and staff.¹⁹ Each aspect has an ordinal scaled structure, whereby higher values correspond to the defined types of increasing aggressive behaviour. The sum score represents the intensity of aggressive incidents.²⁰ Aggression severity can be properly measured using the naturalized revised version of this scale, and its level in various settings can be studied and compared.

In the revised version, each event is given a score between 0 and 22. The higher scores indicate a greater severity of aggression.⁵ According to the studies conducted so far, this scale has generated more acceptable results compared to the other available tools.^{14,16,17,21,22} For instance, with respect to correlation calculated with the other methods for assessing the severity of aggressive behaviour, the scores obtained have varied from 0.38 to 0.81.⁹

The results of the studies have shown a favourable inter-rater reliability score for the SOAS-R. First, an internal correlation coefficient of 0.96 was obtained by

independent raters. The studies were then aligned with the clinical results. The inter-rater reliability was determined with Cohen scores of 0.61 to 0.74 and a Pearson correlation coefficient of 0.87.¹⁴ The completion of this tool takes two or three minutes and the findings can be easily used for evaluation processes at the personal and organizational levels.

The VAS is a measurement tool for measuring a characteristic that is found across a range of values. This has been established as a valid and reliable scale in a range of clinical applications. It is a suitable tool to assess stress, anxiety, pain, moods, and aggression, making it appropriate for measuring subjective experience.^{14,23}

The VAS is a suitable scale for the prediction of physical and verbal aggression. It can mark the severity of the aggression on a continuous mm scale ranging from 'not severe at all' (at the 0- end of the VAS) to 'extremely severe' (at the 100-end of the VAS). The VAS still requires external validation for considering outcomes. However, the use of a VAS for aggression assessment is still considered to be a suitable and useful tool to help nurses detect a level of aggression in psychiatric patients.

The present study was conducted to translate the SOAS-R into Persian and determine the psychometric properties of psychiatric inpatients hospitalized in psychiatric wards.

After obtaining the required permission from the original author of the SOAS-R (Nijman), a standard translation of the SOAS-R into Persian was done by two Persian native translators, following the WHO guidelines. The second step was to combine and integrate the initial translations into one unified entity. At this stage, the first translated versions were carefully revised by another translator who was an expert in both Persian and English. Then the two initial translated versions were compared with each other and the existing differences and contradictions were ironed out. Ultimately, the final version of the scale in Persian was obtained by integrating the initial ones. The third step was to translate the final version from Persian into English. In the fourth step, the English version was eventually matched with the original SOAS-R and the backward translated English version was

checked by Nijman. Finally, the Persian version of the scale was grammatically revised by expert translators and presented for the evaluation of psychometric properties (Figure 1). To determine the face validity of the tool, after the scale was translated from the original to the target language and the translated SOAS-R was developed, two separate teams – the experts and the target group – were formed. The items of the scale that were difficult to understand were revised by the translators. The information obtained from the two groups was then analysed, evaluated, and finally implemented in the translated version.

The concurrent criterion validity was determined through the comparison of the scores obtained for this SOAS-R and the VAS.

After each aggressive incident, the nurses completed the SOAS-R and the VAS. The reliability of the scale was determined, using the inter-rater reliability method, in which 10 aggressive events (verbally or physically) were concurrently and separately analysed by two staff nurses who had witnessed and recorded them in every morning and afternoon shifts during a week in an adult psychiatric ward. In other words, the results obtained with regard to the verbal and physical aggression were compared. The construct validity of the scale was assessed by comparing the known groups. Generally, the known-groups technique is a typical method to determine the construct validity and is provided when two or more groups expect differences in the measure. A known group's analysis presupposes that definite groups of respondents will score greater on a scale than others. If the test is able to differentiate between the groups using statistically significant data, this provides evidence for the validity of the measure.²⁴

The statistical analysis requires five to 10 samples for each item in the scale. The present study took more than seven samples for each item. After the data were gathered, the descriptive analysis, validity, and reliability were analysed using SPSS software. In this study, out of the 981 patients hospitalized in acute psychiatric wards, 162 patients showed aggressive behaviour and 319 aggression events were sampled during seven months. The data obtained from the scale were shown

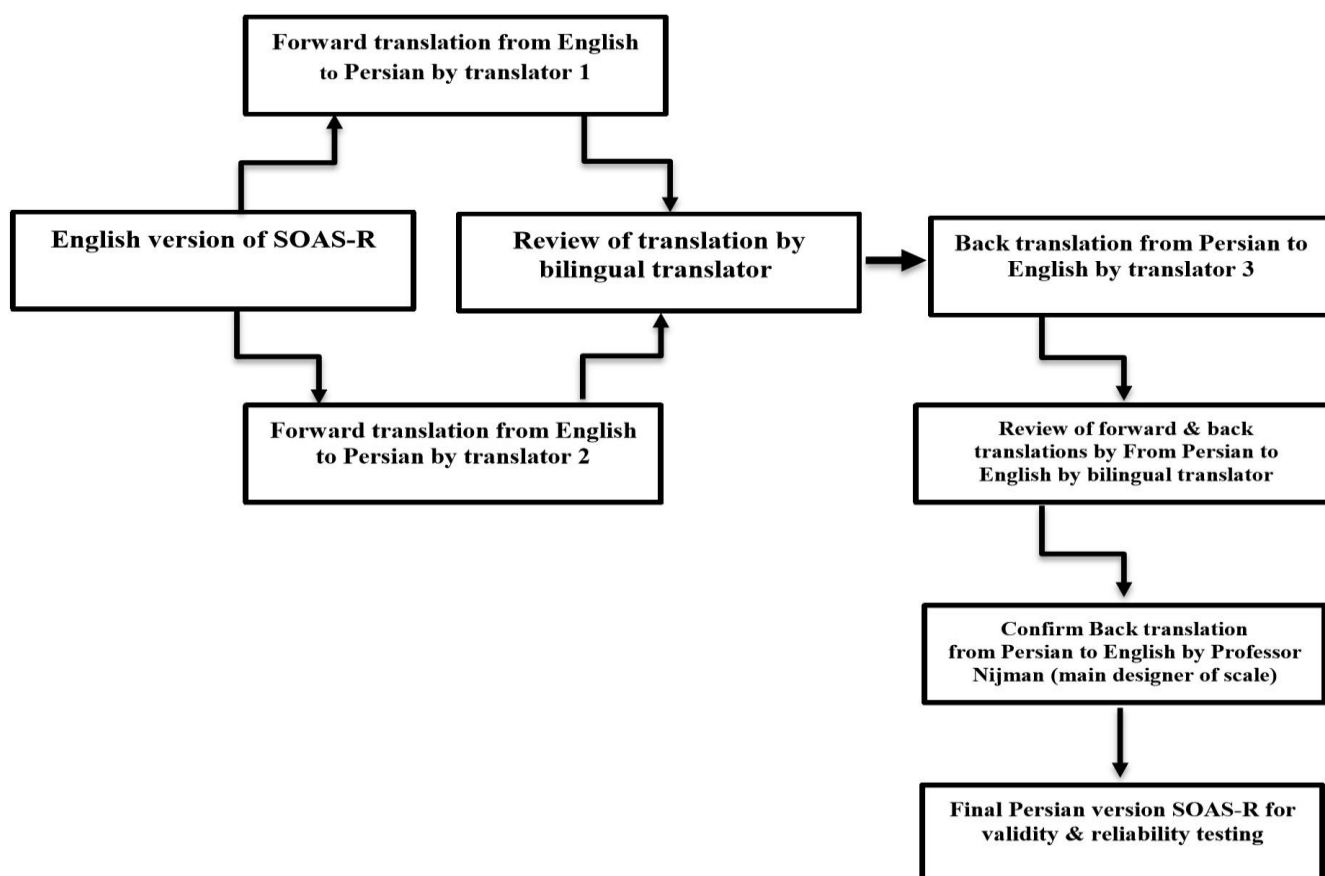


Figure 1. Forward and back translations of the SOAS-R

in the form of frequency distribution, mean, and standard deviation. The ICC and kappa test were used to measure the raters' agreement on the SOAS-R. The relationship between the SOAS-R and VAS was assessed by the Spearman-Brown test. The ethics committee of Baqiyatallah University of Medical Sciences has approved the proposal (IR.BMSU.REC.1395.375). It has reviewed the study and raised no objections from an ethical point of view. Permission to carry out the study was first obtained from Nijman—the principle designer of the SOAS-R. The nurses were briefed about the study and gave their consent for participation. The patients' basic rights were emphasized, including individual information, treatment benefit, and care quality by hospital management.

Results

During the period of this study, out of 981 psychiatric patients hospitalized in the wards,

162 patients (105 men and 57 women) at the age range of 17–73 years and a mean age of 31.34 (10.94) showed aggressive behaviours; 319 aggression events were witnessed and registered by the nurses. Some of the patient's committed aggressive behaviours more than once (from one to eight times). The mean aggression score for the registered events was 8.28 (4.63) (Tables 1,2).

To confirm the validity of the scale, known groups were compared. Since aggression is mostly verbal, the results of the present study were compared to the results for the verbal and physical aggression groups. In the group of patients prone to physical aggression, significant differences were observed between the severity of aggression in the VAS and the overall score in the SOAS-R (Table 3).

The concurrent criterion validity was assessed by examining the correlation between the severity of the patients' aggression (using the SOAS-R) and the VAS. In fact, the VAS

scores were considered as the index, while the results showed Pearson correlation coefficients of 0.128–0.901 for the aspects of the scale (Table 4). Using the Pearson correlation coefficient, a higher ratio of the scores obtained for the two scales would lead to a higher validity coefficient of the SOAS-R.²⁵

The inter-rater reliability measure is used to determine the reliability of tools that employ a direct observation of behaviour. The correlation between the both the ratter scores is considered to be the reliability index. The greater is the agreement between the

scores.^{25,26} The present study found an ICC of 0.852–0.995 and a kappa coefficient of 0.43–0.65 for different aspects of the SOAS-R (Table 5).

Discussion

The results of the current study deal with the psychometric properties of the SOAS-R in Tehran, Iran. Aggressive Behaviour is necessary for considering contextual factors when investigating inpatient violence and aggression.²⁷ The SOAS-R has been

Table 1. The demographic data

Variables	N (%)
Gender	
Male	213 (66.8)
Female	106 (33.2)
Marital Status	
Single	148 (46.4)
Married	146 (45.8)
Separated	25 (7.8)
Education	
Primary education & below	25 (7.8)
Junior high & high school diploma	217 (68)
Academic degree	77 (24.2)

Table 2. Descriptive statistics including scale scores, age and frequency in the patients

Variables	Maximum	Minimum	Mean (SD)
Age (years)	73	17	31.34 (10.94)
Frequency of aggression	8	1	3.23 (2.22)
Severity of aggression	22	0	8.28 (4.63)
Severity of aggression in the VAS	100	8	54.44 (22.55)

SD: Standard Deviation

Table 3. Comparison of aggression severity in the VAS and the SOAS-R aspects

Type of Aggression	Verbal (n=273)		Physical (n=46)	
	Mean (SD)	Mean(SD)	Mean(SD)	t-test
SOAS-R aspects				
Provocation	0.549 (0.71)	0.56 (0.18)		-0.13
Means used by patient	0.00 (0.00)	1.63 (0.55)		-39.03**
Target of aggression	2.74 (1.25)	2.81(0.82)		-0.31*
Consequence(s)for victims	1.27 (1.07)	2.56 (1.95)		-5.37*
Measure(s) to stop aggression	0.87 (0.78)	1.81(1.95)		-4.64*
Overall SOAS-R Score	1.33 (0.55)	2.22 (0.65)		-8.12*
VAS Score	40.77 (16.7)	57.92 (18.66)		-4.6*

*P< 0.05, **P< 0.01, SD = Standard Deviation

Table 4. The correlation between the SOAS-R and the VAS scores

Variable / Coefficient	VAS	P- Value
SOAS-R aspects		
Provocation	r = 0.12	0.04
Means used by patient	r = 0.71	P<0.001
Target of aggression	r = 0.44	P<0.001
Consequence(s)for victims	r = 0.74	P<0.001
Measure(s) to stop aggression	r = 0.72	P<0.001
Overall scale score	r = 0.90	P<0.001

Table 5. Inter-rater reliability with the ICC and Kappa coefficient

Variable / Coefficient	ICC	Kappa
SOAS-R aspects		
Provocation	0.98	0.63
Means used by patient	0.96	0.46
Target of aggression	0.85	0.49
Consequence(s)for victims	0.99	0.63
Measure(s) to stop aggression	0.97	0.43
Overall Scale Score	0.99	0.65

developed to assess inpatient aggression.

This is an incident-based scale which is supposed to be completed every time a staff member witness's aggressive behaviour by a client.¹⁴ This is the first study in which SOAS-R has been translated into Persian and deal with the psychometric properties of this scale in Tehran. The Persian version of the SOAS-R—just like the original and the other translated version—has a good validity and reliability for the assessment of aggression in psychiatric patients. Thus, the SOAS-R is widely used to document aggressive events and has adequate validity and reliability. Many studies have been conducted so far for the validation of this scale in countries such as the Netherlands, Japan, China and the US. These studies have obtained an acceptable validity for the scale; this scale has consequently been used in many European countries.^{3,4,7,9,14-17} In our study, using the known group's technique, the SOAS-R was found to have acceptable criterion and construct validity. Therefore, the construct validity for the scale is fair to good. While some studies have also attributed it with high coefficients (ICC= 0.72-0.96)²⁰ and good inter-rater reliability (Cohen's kappa = 0.74-0.81), the original SOAS ranged from kappa = 0.61-0.74.¹⁴ In

yet another study by Nijman *et al.*, with a sample size of 556 registered cases, the Pearson correlation for SOAS-R was 0.6 compared to the VAS.¹⁵ In a study by Noda *et al.*, on 290 events, the inter-rater reliability was 0.7 with the Pearson correlation being 0.38 compared to the VAS.³ The Japanese version of the SOAS-R studied the validity and reliability of this scale. The study revealed that the inter-rater reliability of the severity scores, assessed by Cronbach's alpha, was 0.70.⁷ In our study, the ICC was 0.85-0.99, while the kappa coefficient was 0.43-0.65 for different aspects of this scale. Also, the concurrent validity of the SOAS-R estimates on VAS correlations ranged from 0.49 to 0.62.¹⁴ The strengths of the present study include gold standard translation approach and an excellent sample size.

The present study has certain limitations, in that the sample comprised psychiatric patients from adult psychiatric inpatients in two hospitals of Tehran. Further psychometric testing replicating other settings of the country are recommended, as comparative investigations between acute and chronic psychiatric patients. Generalization of the results may be affected by the sample (restricted to adult

psychiatric inpatients); this can be perceived as a limitation. An additional limitation is that patients were not selected by random sampling method, and thus are perhaps not representative of Iranian adults with psychiatric disorders. Further psychometric studies are needed in diverse populations.

Conclusion

In conclusion, the present study provides evidence of scale validity and the test-retest reliability of the Persian translation of the SOAS-R in Iranian psychiatric inpatients aged 17–73 years. The SOAS-R is a specific measurement tool for assessing inpatient aggression. The Persian version can be said to match the original scale. The use of this scale is recommended as a valid and reliable tool for the investigation of the frequency and severity of aggression in hospitalized emergency patients, and it will have applications in aggression research.

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Ethical issues

None to be declared.

Conflict of interest

The authors declare no conflict of interest in this study.

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