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ISTAP classification for skin tears: Validation for Brazilian Portuguese

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Abstract

The objective of this study was to evaluate interobserver reliability and the concurrent criterion validity of the adapted version of the International Skin Tear Advisory Panel (ISTAP) Skin Tear Classification System to Brazilian Portuguese. For the evaluation of interobserver reliability using the photograph database, 36 nurses classified 30 skin tears (STs) into three groups, according to its definitions (adapted version). For the evaluation through clinical application, 23 nurses classified 12 STs present in 8 thoracic and cardiovascular postoperative patients at a tertiary hospital in Sao Paulo, Brazil. For the data collection of patients, an enterostomal therapist nurse classified the ST found by simultaneously using the adapted ISTAP version and the Skin Tear Audit Research (STAR) Classification System to test the concurrent criterion validity. The average of 17.83 correct answers (SD = 5.03) resulted from 1080 photograph observations, with Fleiss $\kappa = 0.279$ (reasonable concordance level). The interobserver reliability in the clinical application resulted in a global correct answer percentage of 76.7% in 85 observations. The concurrent criterion validity was attested by the total correlation ($r = 1$) between ISTAP and STAR. The ISTAP classification for ST is a reliable instrument and also valid in Brazil, making it another option to be used in clinical practice.

KEYWORDS

advanced practice nursing, nursing methodology research, skin tears, validation studies, wounds and injuries

1 | INTRODUCTION

Skin tears (STs) are acute traumatic wounds caused by shear, friction, and/or brute force, including the removal of adhesives, resulting in the rupture of skin layers, dermis and epidermis, or even between them and the underlying tissues.[1-3] STs are associated with factors such as extremes of age (neonatal and elderly), dehydration, malnutrition (decrease in albumin serum level),[4] pharmacological therapy (corticoids and anticoagulants), mobility impairment, and mechanical factors associated with basic care[1,5] being, in many cases, underreported.

Patients with previous ST history in the last 12 months, the presence of purpura and elastosis, the history of falls in the last 3 months, and male individuals are also regarded as risk factors for their appearance.[6] Purpura and elastosis were found in 73.2% and 57.8% of patients with STs, respectively.[7]

The epidemiological studies concerning STs are primarily conducted with hospitalised patients and residents from long-term care facilities for the care of the elderly and individuals with chronic disease. In a multicentre study performed at nine tertiary hospitals in China, a prevalence of 1.07% was identified in a sample of 13.176 patients.[8] In Brazil, also at a tertiary hospital, the ST prevalence was of 3.3% among 157 oncologic patients.[9] A higher value was found in a study conducted in Denmark, with a prevalence of 11.4% in 202 patients admitted at a hospital of the same level.[10] Among studies performed in long-term care facilities for the elderly, the ST prevalence found was of 3% in Belgium,[11] 4.6% in Denmark,[12] 11.6% in Brazil,[13] and 14.7% in Canada.[14] Some studies have indicated associations between ST occurrence and low scores in the Braden scale.[8,14]

A systematic review identified that ST prevalence varied from 3.3% to 22% in hospitals and from 5.5% to 19.5% in the community. Besides, the main risk factors associated with ST were advanced age and dependency to perform basic daily activities.[15] The ST incidence, also in a systematic review, varied between 2.23% and 92% in long-term care facilities for the elderly and 2.1% in men and 4.6% in women in the community.[16]

Two ST-validated classification systems have been reported in the literature: the Skin Tear Audit Research (STAR)[3]and the International Skin Tear Advisory Panel (ISTAP).[1] There exists numerous articles pertaining to the epidemiology and ST best practices in recent years.

STAR was developed by an Australian group led by Professor Keryln Carville, and was based on a modified version of the system proposed by Payne and Martin[17] in the beginning of the 1990s. Interestingly, the Payne and Martin ST classification system is still found in practice today, despite the fact that it was never validated in the literature.[17] The STAR includes five types of STs associated with photographs, aside from a treatment guide and a glossary.[3] In the beginning of 2015, it was adapted and validated to be used in Brazil.[18]

ISTAP, originally created and coordinated by LeBlanc and Baranoski, officially initiated its activities after a survey that aimed to identify the ST knowledge of health professionals from 16 countries in North America, Europe, Asia, and Oceania.[1] After verifying that 69.6% of participants showed difficulties with documenting and managing these lesions, despite the existence of some classification systems,[3,17] ISTAP proposed the creation of a consensus, with the collaboration of 13 professionals from the United States, Canada, United Kingdom, and Australia. The panel then published a document containing 12 declarations about ST prediction, prevention, evaluation, and treatment.[1] The consensus included the creation of a new classification system, more practical and objective, according to the authors—the *ISTAP Skin Tear Classification*—composed of the description of three types of lesions also associated with photographs. The intrareliability (panel members) and interobservers (clinical nurses) were attested through the evaluation and grouping of 30 images from a validated photograph database and classified according to the similarities between the lesions.[19]

Key Messages

- The standardization of health terminology is an important aspect of professional work in the global and interdisciplinary context to strengthen evidence-based care.
- Using a non-adapted foreign classification system could negatively impact on its accuracy in clinical practice, because of an inherent process of language adequacy, hence the necessity of a cultural adaptation and validation into local languages.
- After cultural adaptation and content validity confirmation, the adapted Brazilian version of the International Skin Tear Advisory Panel (ISTAP) Classification System had also confirmed its interrater reliability, through photography and clinical application, besides concurrent validity.
- Brazilian study is the first one to include clinical application as a methodological strategy to assess reliability and validity measures for ISTAP Classification. Since now, Brazil joins Canada, Denmark, Italy, and Sweden as countries with the culturally adapted and validated instrument.

This study was motivated by the possibility of making another ST classification instrument available in Brazil, initiated by the process of cultural adaptation and validation of the content from the adapted version, from which the results have already been published.[18] Thus, the present study aimed to evaluate the interobserver reliability and the concurrent criterion validity from the ISTAP version adapted to Brazilian Portuguese.

2 | MATERIALS AND METHODS

2.1 | Study design and location

This is a methodological study using a quantitative approach concerning the validation of the adapted *ISTAP Skin Tear Classification* version to Portuguese in Brazil. The data collection was conducted at a high complexity

university hospital specialised in cardiology, pneumology, cardiac, and thoracic surgery located in Sao Paulo, Brazil.

2.2 | Instruments

2.2.1 | ISTAP classification system for skin tears

The *ISTAP Skin Tear Classification* was elaborated as a photograph association system with three types of lesions, characterised according to tissue loss. Its internal validity was established through simultaneous photograph evaluation made by specialists. Panel members grouped an original database containing 30 pre-selected ST photographs according to their similarities to test the instrument's internal validity, without its reference. The fact that it was performed blindly allowed the instrument's simplicity to be tested by grouping the lesions without the need of the scale.[19] Stability was originally tested 2 months later, repeating the previous process. For external validity, the study used a 327 individuals' sample, which went through the same photograph grouping process, again without reference to the classification system, that is, only through similarities between characteristics. From the 327 individuals, 259 were nurses, from which 44 had different professional levels (certified, licensed, and registered) and 24 were not nurses. For the interobserver reliability analysis, the professionals who were not nurses were excluded. From the 303 nurses included in the analysis, only 190 sent us answers that could be analysed, which resulted in a moderate concordance level (Fleiss $\kappa = 0.545$).[19]

The re-test showed a satisfactory concordance level (Cohen $k = 0.877$). The intraobserver reliability showed varied concordance levels, according to the expertise and category of the nurses involved, and was high for panel members (Fleiss $\kappa = 0.653$) and moderate among the others (Fleiss $\kappa = 0.555$ for the registered ones and 0.480 for the licensed and registered ones).[19]

In Brazil, the cultural adaptation of the instrument was attested systematically and its results have already been published.[18]

2.2.2 | STAR classification system: skin tears

The STAR project was created to remodel the Payne and Martin Classification System, with the intent of establishing a universal language based on evidence. With a photograph database of ST images, a group of Australian nurses specialised in wounds revised, tested, and redefined the Payne and Martin classification system,[17] applying it to nonspecialist nurses and other health professionals for the interobserver reliability test. The authors obtained a general concordance of 93% (Cohen's κ).[3]

The instrument is composed of two parts: a treatment guide, which contains six topics related to the care of ST and its surrounding skin; and a classification system with five ST photographs and their respective categories (1a, 1b, 2a, 2b, and 3) according to the presence or absence of skin patches and its viability. It also presents a glossary with ST definitions and some other related technical terms.[3]

In Brazil, the STAR Classification System—was adapted and validated in 2015, after translation, evaluation by a judge committee, and back-translation. The validation of the adapted version was carried out through interobserver reliability, evaluated by the concordance obtained for the association between each category's definition and their respective images in the classification system, by 107 nurses present at the Brazilian Stomatherapy Congress in 2009. The authors obtained a regular concordance level (weighted $\kappa = 0.286$). The clinical application of the Brazilian version of STAR was conducted with 20 nurses, who had no previous knowledge of the classification system. They classified nine STs present in five hospitalised cancer patients, obtaining a moderate concordance (weighted $\kappa = 0.596$).[20]

2.3 | Ethical considerations

This research project was approved by the School of Nursing of the University of São Paulo Ethics in Research Committee (Process No. 66513517.7.0000.5392/2017/CEPEEUSP), after approval of the institution where the data collection for the measure properties evaluation of the adapted version was conducted. The nurses and patients who participated were included in the study sample only after consent was given.

2.4 | Study process

After the content validity of the adapted *ISTAP Skin Tear Classification System* in Brazil was confirmed,[18] the evaluation of two other measure properties was carried out, and here described are interobserver reliability, through photographs and clinical application, and concurrent criterion validity.

2.4.1 | Interobserver reliability: photograph database stage

Reliability is the consistence with which an instrument measures an attribute. The instrument is reliable to the

proportion of which its measurements reflect true values. A reliable instrument maximises the true component and minimises the error component of the obtained score. The error level may be evaluated by the interobserver reliability, in which one or more trained observers make simultaneous and independent observations. The concordance level is calculated with the intent of evaluating the strength of the relation between the classifications. Thus, when two observers evaluate the same phenomenon and present congruent values in the score, the evaluated instrument is considered precise and reliable.[21]

A total of 36 nurses who were not specialised in wound care, acting in the clinical units and intensive care unit (ICU), participated in this stage without previous knowledge of the instrument.

The interobserver reliability was obtained through visual evaluation of 30 ST photographs, which were part of the ISTAP panel and already validated for the validation process of the original instrument, kindly provided by the original author for this study. It is composed of type 1 (7), type 2 (15), and type 3 (8) lesions. The participating nurses were asked to group the 30 ST photographs according to the definitions of three types of ST taken from the version that had already been adapted to Brazilian Portuguese.[18] Each photograph was numbered to facilitate the classification, and the types were distributed between two groups, A and C. Each of the nurses involved in this stage classified them according only to the critical evaluation of the photographs.

Sociodemographic data (age, sex, and marital status) and professional data (graduation year, time working, type of education—undergraduate, postgraduate, and participation in scientific activities—listeners, lecturers, and publications) of the participating nurses in this stage were also collected through an instrument specifically designed for this end.

2.4.2 | Interobserver reliability: clinical application

In this stage, 23 surgical ICU nonspecialist nurses took part in the wound care. Aside from these, eight adult patients who were hospitalised there and had ST also participated. The interobserver reliability through clinical application was obtained by comparing the evaluations carried out first by an *Enterostomal therapist nurse (*ETN) (nurse specialist in wound, ostomy, and continence care), followed by the assisting nurses.

Sociodemographic data (age, sex, and marital status) and professional data (graduation year, time working, type of education—undergraduate, postgraduate, participation in scientific activities—listeners, lecturers, or publications) of the participating assisting nurses and demographic data (age, sex, and race) and clinical data (diagnostic, surgery, vasoactive and sedative drugs, comorbidity, consciousness level, diet, hospitalisation time—in the hospital and in the ICU) from the patients were also collected.

2.4.3 | Concurrent criterion validity

The instrument validity indicates to what degree the instrument measures what it should supposedly measure. Three important aspects must be analysed to test it, among which the concurrent criterion validity. This considers the concordance in the instrument studied as a definitive measure, such as the one that is already considered the gold standard. This validity is typically tested when a new instrument is created as a simpler alternative to the usual one. The concurrent criterion validity relates the application of two equivalent instruments, at the same time and with the same sample, to analyse the correlation degree between two measurements of a same concept.[21]

For the study of this property, the ETN also classified the ST found with the STAR Classification System—skin tears simultaneously to the application of the ISTAP Skin Tear Classification System.

2.5 | Statistical analysis

The data obtained during all stages of the validation process were typed and stored using Microsoft Office Excel 2010 for Windows spreadsheets and later statistically analysed with the statistical package R. For the analyses of the sociodemographic and clinical data, measurements of central tendency (such as frequency, mean, and median), variability (SD, maximum, minimum) and the psychometric analyses were used. In the photograph stage, the result was analysed using Fleiss κ[22] with the following categorisation regarding concordance levels: <0 (poor), 0 to 0.20 (weak), 0.21 to 0.40 (reasonable), 0.41 to 0.60 (moderate), 0.61 to 0.80 (considerable), and 0.81 to 1.0 (almost perfect).[23] The percentage of correct answers was additionally employed in the photograph stage and was used exclusively for the analysis in the clinical application of the adapted instrument stage.

The concurrent criterion validity analysis was performed using Pearson's correlation. Correlation values below 0.30 were considered weak, between 0.30 and 0.50 were considered moderate, and above 0.05 was considered strong.[24] Regarding statistical significance, a P value of <.05 was used for all analyses.

TABLE 1 Right and wrong answers given by the nurses for each type of ST, using the photograph database

Types of skin tears	Right n	Right %	Wrong n	Wrong %	Total n	Total %
Type 1	206	81.7	46	18.3	252	100
Type 2	274	51.7	256	48.3	530	100
Type 3	162	56.2	126	43.8	288	100

TABLE 2 Right and wrong answers given by the nurses for each ST, in clinical practice

Skin tears	Right n	Right %	Wrong n	Wrong %	Total n	Total %
Lesion 1	0	0	3	100	3	100
Lesion 2	5	63	3	27	8	100
Lesion 3	10	83	2	17	12	100
Lesion 4	2	100	0	0	2	100
Lesion 5	7	88	1	12	8	100
Lesion 6	5	83	1	17	6	100
Lesion 7	5	83	1	17	6	100
Lesion 8	6	75	2	25	8	100
Lesion 9	7	88	1	12	8	100
Lesion 10	7	88	1	12	8	100
Lesion 11	5	63	3	37	8	100
Lesion 12	7	88	1	12	8	100
Total	66	76.7	19	23,3	85	100

3 | RESULTS

The results are presented according to the properties of the measures evaluated.

3.1 | Interobserver reliability: photograph database stage

From the 36 nurses who took part in this stage, 83.4% (30) were females, with an average age of 36 years old (SD = 9.54), 41.7% (15) with 10 or more years of education, and average work life of 9.55 years (SD = 7.56).

The 36 nurses generated 1080 observations by classifying 30 photographs, according to the ISTAP definitions. The mean of correct answers was 17.8 (SD = 5.03) and the median was 18.5. Table 1 shows the errors and correct answers according to the type of skin tears.

A reasonable concordance level (Fleiss $\kappa = 0.279$) was obtained among the nonspecialist nurses in wound care, when analysing 30 photographs from the standardised database, attesting the properties of measures evaluated here.

3.2 | Interobserver reliability: clinical application

From the 23 nurses participating in the stage of clinical application of the ISTAP version that had already been adapted to Brazilian Portuguese, 78.3% (18) were females, with an average age of 32.2 years old (SD = 6.21), 43.5% (10) between 6 and 10 years of education, and an average work life of 6.35 years (SD = 4.83). From the eight patients in the sample, five were Caucasian males, with an average of 54.6 years old, average hospitalisation time of 38.9 days, and average ICU time of 20.1 days; four of them had undergone cardiac surgery, four were diabetic, three were hypertensive and two were obese; seven were using vasoactive drugs, four were using sedative drugs; five were using enteral diet.

A total of 23 nurses classified 12 STs in eight patients, according to the ISTAP Skin Tear Classification System, in the already adapted version, generating 85 observations. Table 2 shows the distribution of wrong and correct answers of the nurses' clinical evaluation of skin tears.

The global percentage of correct answers was 76.7%. The 12 lesions were found in eight patients in the axillary region (2), inguinal (1), subclavian (1), upper limbs (2), lower limbs (2), hip (1), and thorax (2).

3.3 | Concurrent criterion validity

Table 3 shows a comparison between ISTAP and STAR classifications, conducted by an ETN. The correlation between evaluations using both instruments was excellent and of strong magnitude ($r = 1$).

4 | DISCUSSION

After the cultural adaptation of ISTAP Skin Tear Classification System,[18] it was validated to Brazilian Portuguese, attesting its interobserver reliability and concurrent criterion validity.

TABLE 3 ST classification given by the *enterostomal therapist nurse* using ISTAP and STAR

Skin tears classification	ISTAP	STAR
Lesions (1, 4–12)	3	3
Lesion 2	1	1B
Lesion 3	2	2B

In the photograph stage, for the interobserver reliability analysis, a reasonable concordance level ($k = 0.279$) was found, as well as an adequate global percentage of correct answers in the clinical stage (76.7%). For the concurrent criterion validity, the correlation between the classifications carried out through both systems (STAR and ISTAP) was excellent with strong magnitude.

With the adaptation of the ISTAP Skin Tear Classification, Brazil joins Denmark,[25] Sweden,[26] Italy,[27] and Canada, with cultural adaptations in French[28] and English.[19] The first country to adapt the classification system was Denmark,[25] which, like the original study,[19] used the 30 photograph database to validate the instrument. This study was performed with a sample of 270 professionals from the health area (241 nurses) and obtained a moderate concordance ($k = 0.46$),[25] similar to the original study.[19] The ISTAP Skin Tear Classification validation study in Sweden was conducted with 84 health professionals (59 nurses), showing moderate concordance ($k = 0.50$).[26] For the Italian validation, the sample of 209 health professionals (197 nurses and 12 who were not nurses) also showed moderate concordance ($k = 0.46$).[27] In the version adapted to Canadian French, the concordance was satisfactory ($k = 0.69$) in a sample of 92 nurses.[28]

Comparatively to these studies, the Brazilian version of ISTAP reached a much lower concordance level ($k = 0.279$). However, it is the first and only study that performed the clinical application of the ISTAP Skin Tear Classification with patients, entailing a much higher global correct answer percentage (76.7%), which confirms the findings of the original study in the construction and study of the ISTAP reliability.[19] These results also confirm the findings of another study designed by the Brazilian authors in the process of validating the adapted version of STAR, where they employed both methods to study interobserver reliability: photographs and clinical application. This way they showed the relevance of applying adapted instruments in the clinical practice, with real patients, generating more satisfactory results when compared with the evaluation with photographs.

The impact generated by the ST appearance affects the clinic, care cost, and life quality of the individual, mainly because the lesions are referred to as painful. To better understand the phenomenon, using as basis structures brought by consensus, such as the ISTAP, entails better care and especially better prevention. Having another instrument validated in Brazilian Portuguese will allow standardised records, comparable to the international ones, aside from the possibility of debating improvement practices directed to this type of lesion.

One of the limitations of this study concerns the clinical data collection location, since it is a high complexity scenario, which may contribute to difficulties both in assisting nurse's availability to participate in the study and in the recruitment of more clinically unstable patients.

It is recommended that the instrument is applied at other health institutions, hospitals and long-term care facilities, with heterogeneous samples of both patients and professional teams, so that the adapted version of the ISTAP Skin Tear Classification System may be tested after the teams have received the adequate specific training. It is also recommended to have more enterostomal therapists in the evaluation of the concurrent criterion validity, by applying STAR consecutively. Denmark was the first country to adapt and validate the ISTAP Classification System, followed by Sweden, Italy, and Canada, in French. Other countries adapted the ISTAP, such as the Czech Republic and Chile, and these countries are currently in the process of validating ISTAP.

5 | CONCLUSION

The study identified a reasonable concordance level in the photograph observations, correct answer rate of 76.7% concerning interobserver reliability, and correlation between ISTAP and STAR of 1. Thus, the ISTAP Skin Tear Classification System is a reliable instrument and also valid in Brazil, making it another option to be used in clinical practice.

CONFLICT OF INTEREST

The authors declare no potential conflict of interest.

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