

Validation and Responsiveness of the Rosacea Area and Severity Index in a Chinese Cohort: A Comparative Study with the Investigator's Global Assessment

Yukun WANG^{1,2†}, Hongjie LUO^{1,2†}, Deyu SONG^{1,2}, Xinjin LIU^{1,2}, Yuanting WANG^{1,2}, Yingying DAI^{1,2}, Xucheng ZHOU^{1,2}, Hui LI^{1,2} and Xian JIANG^{1,2*}

¹Department of Dermatology & Venerology, West China Hospital, Sichuan University, Chengdu, China, and ²Laboratory of Dermatology, Clinical Institute of Inflammation and Immunology, Frontiers Science Center for Disease-related Molecular Network, West China Hospital, Sichuan University, Chengdu, China

†These authors contributed equally to this work.

The Rosacea Area and Severity Index (RASI) is a recently developed tool for assessing rosacea severity, but its validation has so far been limited, requiring further independent evaluation. This study aimed to comprehensively assess the reliability, validity and responsiveness of the RASI in a Chinese cohort. Six trained observers independently evaluated standardized photographs of 230 Chinese patients with rosacea using both the RASI and the Investigator's Global Assessment (IGA). Round 1 assessment was used to determine interobserver reliability and convergent validity, while a subgroup of 60 patients was reassessed to evaluate intraobserver reliability and responsiveness (Round 2). In this subgroup, baseline and 1-month follow-up photographs were rescored after 3 months by the same observers. Results showed moderate-to-strong correlations between RASI and IGA at baseline, supporting validity. Interobserver reliability was high for both RASI and IGA overall scores, with intraclass correlation coefficients of 0.923 and 0.935. Intraobserver reliability showed no significant deviation ($p>0.05$). For responsiveness, RASI demonstrated a higher standardized response mean than IGA (0.43 vs 0.37) with a similar effect size. Additionally, RASI detected statistically significant changes ($p<0.001$) in patients classified as "stable" by IGA. Overall, RASI showed robust reliability, validity and superior responsiveness.

Key words: rosacea; severity assessment; Rosacea Area and Severity Index; Investigator's Global Assessment.

Submitted Apr 9, 2026. Accepted after revision May 21, 2026

Published Jun 29, 2026.

DOI: 10.2340/actadv.v106.adv-2026-0599

Acta Derm Venereol 2026; 106: adv-2026-0599.

Corr: Xian Jiang, No.37 Guoxue Alley, Wuhou District, Chengdu, 610041, China. Email: jiangxian@scu.edu.cn

Rosacea is a common inflammatory disorder primarily affecting the central face, characterized by a spectrum of clinical features including persistent erythema, episodic flushing, telangiectasia, papules and

SIGNIFICANCE

This study shows that a new way of assessing rosacea, called the Rosacea Area and Severity Index (RASI), is more consistent and sensitive than an existing method. In simple terms, it helps doctors measure how severe a person's skin condition is in a clearer and more reliable way. This is important because rosacea can vary over time, and having a better tool means changes in the condition can be noticed earlier and more accurately. As a result, doctors and researchers can better track treatment progress and make more informed decisions. Ultimately, this may lead to improved care and better quality of life for people living with rosacea.

pustules, phymatous changes and ocular involvement (1–3). With an estimated global prevalence of 5.5%, rosacea exerts a profound psychosocial burden, impairing patients' quality of life through disfigurement, discomfort and social stigma (4, 5). The chronic, relapsing-remitting and often treatment-refractory nature of rosacea underscores the critical need for valid, reliable and responsive assessment tools. Precise quantification of disease severity is indispensable for evaluating therapeutic efficacy in clinical trials, guiding treatment decisions in daily practice and facilitating cross-study comparisons.

Despite this significance, objective and reproducible tools for quantifying rosacea severity remain underdeveloped (6). The most widely used instrument, Investigator's Global Assessment (IGA), while practical, suffers from inherent limitations: it conflates distinct lesion types into a single global judgment, ignores anatomical distribution and lacks sensitivity to subtle but clinically meaningful changes over time. These shortcomings are particularly problematic in mild-to-moderate rosacea, where incremental improvements may not cross categorical thresholds yet still represent meaningful patient benefit.

To address these gaps, the Rosacea Area and Severity Index (RASI) was recently developed as a novel, composite scoring system (7). Inspired by well-validated dermatological indices like the Psoriasis

Area and Severity Index (PASI) (8) and Eczema Area and Severity Index (EASI) (9), the RASI incorporates the core principles of assessing both the intensity of key clinical signs (erythema, papules/pustules, telangiectasia, phyma) and the extent of involvement across 4 distinct facial areas (cheeks, forehead, nose and chin), weighted according to their relative surface area, and generates a total score ranging from 0 to 72. This design promises a more nuanced, quantitative and comprehensive evaluation of rosacea severity. The initial validation of RASI was conducted in a single, relatively limited cohort. However, the difficulty of discerning erythema and telangiectasia in skin of colour underscores the necessity to validate RASI across diverse populations (10). Furthermore, its longitudinal responsiveness to clinical change has not been assessed and therefore also requires further independent evaluation.

The primary objective of this study was to conduct a comprehensive validation of the RASI in a larger Chinese cohort of rosacea patients with Fitzpatrick skin types III–IV. We aimed to assess its reliability, validity and, most importantly, its responsiveness – the ability to detect clinically relevant changes in disease severity over time, a property crucial for its utility in both clinical trials and practice.

MATERIALS AND METHODS

This retrospective cross-sectional study was approved by the Institutional Review Board of West China Hospital, Sichuan University, and written informed consent was obtained from all participants. The study was conducted between January 2025 and September 2025.

Participants

Six observers from West China Hospital were recruited, including 2 board-certified dermatologists and 4 dermatology residents. Prior to scoring, all observers received a standardized 30 min training session, consisting of the detailed RASI methodology and representative examples illustrating different lesion types, severity grades and involved areas. A brief calibration exercise using pilot cases was conducted to harmonize thresholds; these pilot ratings were excluded from the final analyses. Observers were masked to clinical information and to another's scores to minimize expectation and conformity biases. Data entry used a structured electronic form that enforced complete item responses.

Adult Chinese patients with rosacea aged 20–60 years were enrolled, with no other dermatologic diseases or clinically significant comorbidities, as verified by medical history and physical examination. The

diagnosis of rosacea was established by board-certified dermatologists according to accepted clinical criteria (1, 2). Baseline demographic characteristics and disease features were recorded to describe the study population.

Study design

Detailed scoring criteria for the RASI and IGA are presented in Table SI and Fig. S1. Both instruments assess rosacea severity at a single time point but differ in structure. The IGA rates overall disease severity on a 5-point ordinal scale (0–4). By contrast, the RASI is a composite index that integrates the intensity of individual features with the extent of involvement within each facial region. For the RASI, erythema (E), papules/pustules (P) and telangiectasia (T) are scored from 0 to 4 in each region. Rhinophyma (R) and other nasal findings are scored from 0 to 3, reflecting their typically lower intensity and the greater visibility of mild nasal changes. The extent of involvement in each region (cheeks, forehead, nose and chin) is captured by an extent factor from 0 to 6 according to the percentage affected: 0=none; 1=<10%; 2=10–29%; 3=30–49%; 4=50–69%; 5=70–89%; 6=>90%. The regional RASI score is calculated as (E+P + T+R)×extent factor. To reflect relative surface area, region-specific scores were weighted 0.4 (cheeks), 0.3 (forehead), 0.2 (nose) and 0.1 (chin). The total RASI is the weighted sum of regional scores across the 4 regions. In addition to the overall IGA, lesion-specific IGA variants were implemented for erythema, papules/pustules, telangiectasia and rhinophyma.

All ratings were based on standardized high-resolution digital photographs captured using the VISIA system (Canfield Scientific, Parsippany, NJ, USA) in outpatient settings. All patients maintained a fixed photographic posture using the device's chin rest, and a black drape was applied during imaging to ensure consistent illumination and prevent overexposure. For each patient, a comprehensive set of images was captured, including frontal, left lateral and right lateral views to ensure complete documentation of facial involvement. At each assessment, every observer independently assigned RASI and IGA scores based on the 3-view photographs described above (frontal, left lateral and right lateral), thereby ensuring a complete representation of the patient's skin lesions.

The study protocol comprised 2 separate evaluation rounds (**Fig. 1**). In the first round, all 6 observers independently performed RASI and IGA scoring on baseline data from 230 patients. The primary objective of this round was to assess the correlation between RASI and IGA and to evaluate interobserver reliability. In the second round, 60 patients were randomly selected from the original cohort to evaluate intraobserver reliability over time. The same observers conducted

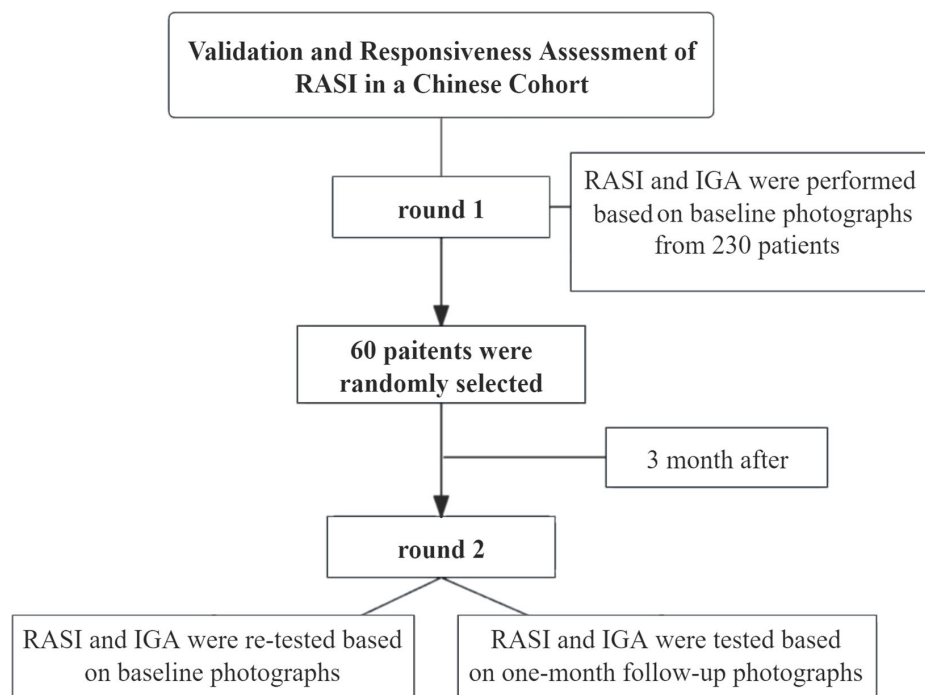


Fig. 1. Flowchart of this study.

RASI and IGA scoring for both baseline and one-month follow-up data from these selected patients 3 months after the first round of evaluation. RASI has also been assessed for responsiveness, reflecting the ability of an instrument to measure change over time. All the enrolled patients received standardized treatment in accordance with the ROSacea CONsensus (ROSCO) recommendations both during the entire study period (2).

Statistical analysis

The agreement between RASI and IGA ratings was assessed using Kendall tau and Spearman correlation coefficient (SCC). For Kendall tau, values exceeding 0.5 indicate moderate-to-strong agreement. SCC values range from -1 to $+1$, with correlations categorized as very weak (0–0.19), weak (0.2–0.39), moderate (0.40–0.59), strong (0.6–0.79) and very strong (0.8–1.0). Interobserver reliabilities for both IGA and RASI were assessed using intraclass correlation coefficients (ICC). This analysis included overall scores and individual key signs (erythema, papules/pustules, telangiectasia, rhinophyma) based on ratings from both evaluation rounds. The ICC results in a value between 0 and 1 with higher values indicating better agreement; values <0.5 indicate poor agreement, values between 0.50 and 0.74 indicate moderate agreement, values between 0.75 and 0.89 indicate good agreement and values between 0.90 and 1.00 indicate excellent agreement. Responsiveness was evaluated using both the standardized response mean (SRM) and effect size (ES). To account for

repeated assessments by multiple raters, all analyses were conducted at the patient level by averaging scores across observers at each time point (round 2: baseline or 1-month follow-up data). Normally distributed data were tested using the independent-samples *t*-test, whereas non-normally distributed data were evaluated with the Mann–Whitney *U* test to assess between-group differences.

Data were analysed from September 2025 to October 2025. In all analyses, 2-sided *p*-values less than 0.05 were considered statistically significant. Data were analysed using software SPSS 29.0, SPSS (Inc, Chicago, IL).

RESULTS

A total of 230 patients with rosacea were enrolled in this study. Item analysis indicated that the full range of RASI scores was used across the cohort, demonstrating coverage of rosacea severity from mild to severe (Fig. 2). Six observers performed 2 rounds of evaluation separated by a 3-month interval.

Convergent validity

Data from the first round of evaluation supported construct validity: RASI scores – overall and by domain (erythema, papules/pustules, telangiectasia, rhinophyma) – increased significantly with higher IGA categories across observers (Fig. 2). Results showed a significantly positive correlation between RASI-overall and IGA-overall scores (Kendall tau=0.593, 95% CI [0.566–0.618], SCC=0.726, 95% CI [0.695–0.754]),

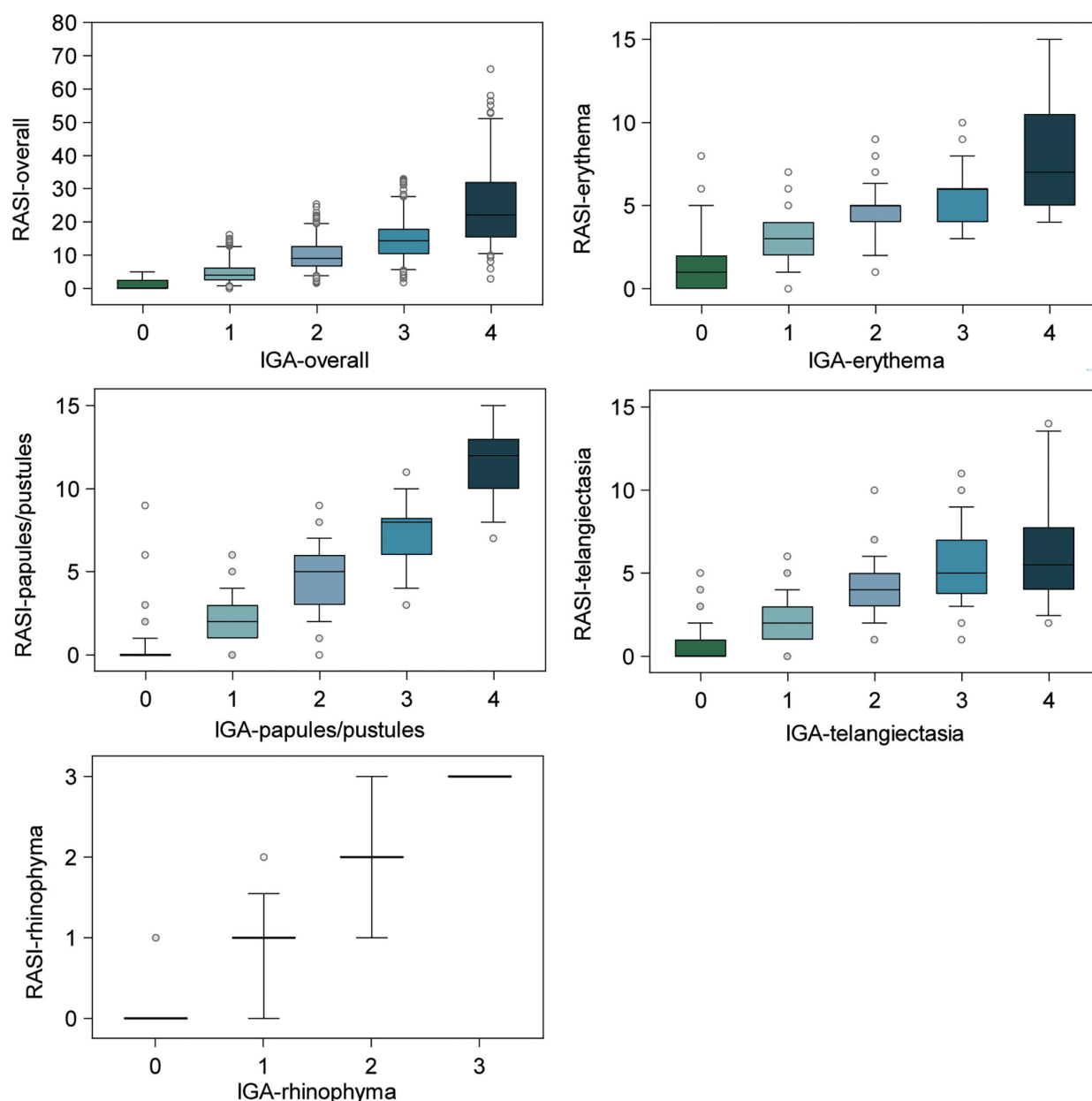


Fig. 2. Box plots depicting the relationship between RASI scores and the corresponding IGA severity grades.

with similar associations observed for their subscales (Fig. 2 and Fig. S2). When categorized by lesion type, rhinophyma showed the strongest correlation (Kendall tau=0.963, 95% CI [0.930–0.991], SCC=0.965, 95% CI [0.932–0.993]), followed by papules/pustules (Kendall tau=0.812, 95% CI [0.792–0.829], SCC=0.881, 95% CI [0.863–0.897]) (Fig. S2).

Inter- and intraobserver reliability

Comprehensive reliability analysis encompassed both inter-observer and intraobserver assessments, with results summarized in **Table I**. In the first round ($n=230$), interobserver agreement was excellent for RASI-overall and IGA-overall (ICC=0.923, 95%

CI [0.851–0.954]; 0.935, 95% CI [0.920–0.948], respectively). In the second round, at the baseline evaluation ($n=60$), interobserver agreement remained excellent for both indices (ICC=0.971, 95% CI [0.955–0.982] for RASI-overall; 0.943, 95% CI [0.908–0.965] for IGA-overall). At the 1-month follow-up assessment in the same round, interobserver agreement was strong for RASI-overall (ICC=0.953, 95% CI [0.919–0.973]) and good for IGA-overall (ICC=0.885, 95% CI [0.806–0.932]).

Subscale analyses for RASI and IGA showed moderate-to-strong agreement, supporting consistent scoring across observers. For RASI-area scores, interobserver agreement (ICC) was good to excellent in all rounds of evaluation. For RASI-severity

Table I. Interobserver reliability of RASI and IGA among 6 observers on 2 rounds

	Round 1	Round 2	
	Baseline	Baseline	One-month follow-up
RASI, ICC (95% CI)			
RASI overall	0.923 (0.851, 0.954)	0.971 (0.955, 0.982)	0.953 (0.919, 0.973)
RASI-severity score			
RASI erythema	0.928 (0.902, 0.946)	0.955 (0.927, 0.973)	0.924 (0.863, 0.956)
RASI papules/pustules	0.962 (0.952, 0.970)	0.975 (0.962, 0.984)	0.958 (0.935, 0.974)
RASI telangiectasia	0.660 (0.495, 0.764)	0.762 (0.673, 0.849)	0.776 (0.623, 0.867)
RASI rhinophyma	0.934 (0.919, 0.946)	0.917 (0.880, 0.946)	0.827 (0.750, 0.887)
RASI-area score			
RASI area-cheek	0.825 (0.727, 0.882)	0.891 (0.832, 0.931)	0.838 (0.755, 0.897)
RASI area-forehead	0.813 (0.701, 0.876)	0.917 (0.880, 0.946)	0.894 (0.840, 0.932)
RASI area-nose	0.848 (0.753, 0.900)	0.926 (0.887, 0.953)	0.889 (0.823, 0.932)
RASI area-chin	0.803 (0.668, 0.874)	0.838 (0.751, 0.898)	0.855 (0.766, 0.911)
IGA, ICC (95% CI)			
IGA-overall	0.935 (0.920, 0.948)	0.943 (0.908, 0.965)	0.885 (0.806, 0.932)
IGA-erythema	0.926 (0.909, 0.940)	0.941 (0.912, 0.962)	0.890 (0.818, 0.933)
IGA-papules/pustules	0.936 (0.920, 0.949)	0.946 (0.918, 0.966)	0.913 (0.852, 0.948)
IGA-telangiectasia	0.765 (0.682, 0.824)	0.720 (0.511, 0.828)	0.733 (0.538, 0.844)
IGA-rhinophyma	0.682 (0.633, 0.730)	0.864 (0.803, 0.911)	0.522 (0.351, 0.707)

ICC: Intraclass Correlation Coefficient; IGA:investigator’s Global Assessment; RASI:Rosacea area and severity index.

scores, erythema and papules/pustules demonstrated excellent agreement across all evaluations, particularly at the baseline evaluation of the second round (ICC=0.955, 95% CI [0.927–0.973] for erythema; 0.975, 95% CI [0.962–0.984] for papules/pustules). IGA exhibited moderate to strong agreement. However, IGA-rhinophyma showed a relatively low ICC at the 1-month follow-up assessment in the second round (ICC=0.522, 95% CI [0.351–0.707]).

To assess intraobserver reliability, the same 6 observers rescored the identical set of baseline images from a randomly selected subgroup of 60 patients in the second round, showing no significant deviation from their first-round RASI scores ($p>0.05$) (Fig. 3).

Responsiveness analysis

To evaluate the responsiveness of the RASI to clinical severity change, patient’s level-based analysis was

applied to SRM and ES. RASI showed an SRM of 0.43 with a mean change of –2.19 and an ES of 0.21. In comparison, IGA showed an SRM of 0.37 with a mean change of –0.22 and an ES of 0.23.

In the second round of evaluation, the 60 patients were further categorized based on the directional change of RASI and IGA from baseline to 1-month follow-up, classified as increased, unchanged or decreased (Fig. 4a). A patient was considered “stable” if the IGA scores remained unchanged across at least 4 observers; otherwise, they were classified as “fluctuating”. Based on this definition, 35 of the 60 patients were identified as having “stable” disease (Fig. 4b). Within the “stable” subgroup, patients were further categorized into “RASI-increased” and “RASI-decreased” for each observer. Significant differences in RASI scores of “stable” subgroups at baseline and 1-month follow-up were observed ($p<0.001$) for all observers (Fig. S3). Further analysis of the RASI severity (erythema,

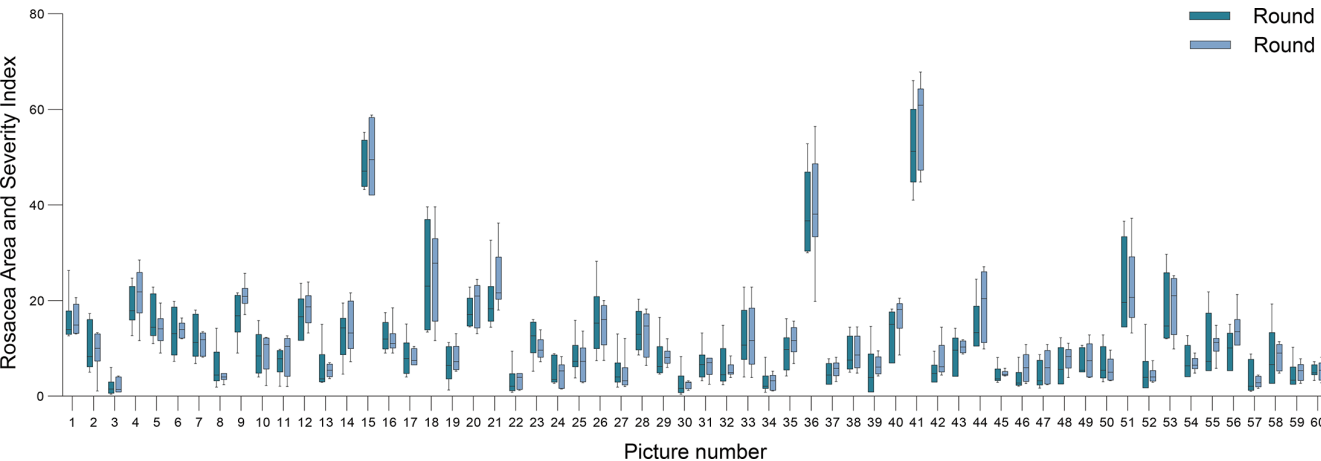


Fig. 3. Interobserver variability of RASI overall scores. Boxplots show the distribution of scores assigned by 6 observers to the same set of 60 patient baseline images on round 1 and round 2. The x-axis identifies each patient image (1–60), and the y-axis shows the RASI overall score (0–72). The median (thick line), interquartile range (boxplot) and 5th/95th percentiles (lines at the end) are displayed.

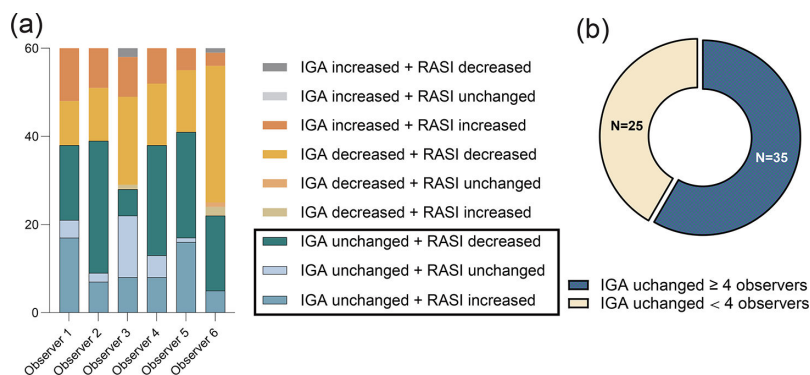


Fig. 4. Stacked bar charts categorizing patients based on the directional change in their IGA and RASI scores between baseline and 1-month follow-up on round 2, as recorded by each observer. The y-axis shows the number of patients. Categories are defined by whether the IGA and RASI scores increased, decreased or remained unchanged. Patients with unchanged IGA scores are highlighted with a bold black border in the chart and legend. (B) Pie chart categorizing patients based on the consistency of IGA ratings across observers. Patients were classified as having “stable” disease (IGA unchanged by ≥ 4 observers, $n=35$) or “fluctuating” disease (IGA unchanged by < 4 observers, $n=25$).

papules/pustules, telangiectasia and rhinophyma) and affected area scores (cheek, forehead, chin and nose) for each observer revealed significant differences in most subscales from baseline to 1-month follow-up (Fig. S4).

DISCUSSION

Ethnic differences in skin structure, baseline pigmentation and cutaneous vascular reactivity are well documented and may substantially influence both the clinical manifestation and visual assessment of rosacea (11–13). As a result, the performance of clinician-reported outcome measures developed in European populations cannot be assumed to be directly transferable to East Asian patients. In addition, differences in phenotype distribution, environmental exposures and clinical practice patterns further underscore the need for population-specific validation (4, 14). Establishing the reliability and validity of the RASI in non-Caucasian populations is therefore critical to ensure its robustness, reproducibility and clinical relevance, and to support its use as a standardized outcome measure in both clinical practice and interventional studies across diverse ethnic populations.

To our knowledge, this study represents the first independent validation of the RASI in a non-Caucasian population. Unlike the original RASI study, our study evaluates its performance in a substantially larger and demographically distinct population using standardized photographic acquisition. Furthermore, we employed a rigorously standardized image acquisition protocol, which differs from prior studies and provides important insights into the reproducibility and scalability of RASI in clinical and screening settings.

Additionally, this study leverages longitudinal follow-up data to provide further evidence for the reliability, validity and particularly the responsiveness of the assessment. These methodological and population

differences may partly explain the higher reliability observed ($ICC=0.66$ vs 0.923). In contrast, the slightly lower validity for erythema ($SCC=0.699$ vs 0.78) and telangiectasia ($SCC=0.76$ vs 0.81) in our study may be attributed to the greater assessment difficulty in individuals with darker skin tones.

We further confirmed strong convergent validity between RASI and IGA, with an overall Spearman correlation coefficient of 0.726 , comparable to the original Danish validation. Notably, correlations were exceptionally high for rhinophyma ($SCC=0.965$) and papules/pustules ($SCC=0.881$). Even in a population where rhinophyma is rare, the near-perfect correlation reflects the clarity of RASI’s operational definitions and the low ambiguity in scoring such structural changes. In contrast, the moderate correlation for erythema ($SCC=0.699$) and telangiectasia ($SCC=0.757$) aligns with known challenges in assessing redness in Fitzpatrick skin types III–IV, where background pigmentation may mask subtle vascular changes.

Interobserver reliability for RASI overall ($ICC=0.923$) markedly exceeds that reported in the initial validation ($ICC=0.53 \sim 0.66$). This discrepancy likely stems from the standardized capturing of facial images using the VISIA Complexion Analysis System to minimize variability due to photographic technique. Furthermore, our observers underwent a structured 30-min training session with annotated exemplars which also likely enhanced the scoring consistency. Relatively high ICCs for individual subscales confirm that RASI’s granular design does not compromise reliability when supported by adequate training and image quality. To specifically evaluate intraobserver reliability, we had the same 6 raters rescore the identical set of baseline photographs from a randomly selected subgroup of 60 patients after a 3-month interval, without access to their prior assessments. No significant drift in RASI overall scores was observed ($p>0.05$), and intra-observer

ICCs remained high (0.971). This demonstrates that individual clinicians maintain stable interpretation of RASI criteria over time, even after a prolonged interval. Such consistency is essential for longitudinal disease monitoring.

The most important advantage the RASI lies in the superior responsiveness to disease severity changes. In this study, RASI demonstrated a higher SRM compared with IGA, while ES estimates were similar between the 2 measures. This pattern suggests that although the overall magnitude of change relative to baseline variability is comparable, RASI may be more sensitive in capturing within-subject change over time. The higher SRM indicates that changes in RASI are more consistent and less variable across patients, supporting its potential advantage in detecting clinically relevant change. Additionally, among 35 patients defined as “stable” by IGA, RASI detected statistically significant changes in overall severity ($p < 0.001$). This finding has profound implications: it reveals that IGA’s categorical nature possesses a “blind spot” for subthreshold fluctuations that are nonetheless quantifiable and potentially clinically relevant. Such insensitivity could lead to difficulties in recognising subtle treatment effects or early disease relapse. In contrast, RASI captures the full spectrum of disease activity, making it ideally suited for monitoring treatment response and disease severity in real-world settings and in early-phase clinical trials, since rosacea is frequently treatment-resistant and many therapeutics demonstrate modest efficacy that may be clinically meaningful yet statistically undetectable using IGA-based endpoints.

Previous studies have demonstrated that VISIA red-area images can more effectively assess the severity of telangiectasia and the extent of lesion involvement (15). Therefore, 6 investigators re-evaluated the RASI and IGA scores of 230 patients based on baseline VISIA red-area images to determine whether this approach could improve inter-observer agreement and score correlations. However, the results showed that scoring based on VISIA red-area images did not lead to any improvement (Table SII). A possible explanation is that VISIA red-area images may overemphasize vascular signals that are not readily discernible to the naked eye, thereby introducing variability in evaluators’ interpretations. In addition, diffuse background erythema may obscure discrete vascular signals, further contributing to inconsistency in assessment.

Limitations

Nevertheless, several limitations warrant acknowledgment. First, although photographic assessment allows standardized image acquisition, repeated evaluation and blinded assessment, photograph-based

2-dimensional ratings have the inherent difficulties to rate the skin lesions such as telangiectasia and erythema, which are susceptible to physiological fluctuations; future work should conduct a direct comparison between VISIA-based image analysis data and the visual assessment scores on the spot. Second, whereas the RASI uses a 5-level scale for most rosacea features (erythema, papules/pustules and telangiectasia), rhinophyma is graded on 4 levels. This reduced scale likely contributes to higher interobserver reliability for rhinophyma but may limit sensitivity to subtler manifestations. Moreover, the RASI does not assess ocular symptoms. Third, our cohort was exclusively Chinese; further validation in other ethnic populations is needed. Additionally, we did not correlate RASI scores with patient-reported outcomes, which are also essential to consider when assessing rosacea patients. Finally, the minimal clinically important difference (MCID) for RASI remains undefined (16).

Conclusion

Our study supports the adoption of RASI for quantifying rosacea severity. Its validated inter- and intraobserver reliability, as well as exceptional responsiveness collectively position it as a potentially valuable tool for clinical practice and trials. We recommend its integration into future rosacea research protocols and encourage future collaboration to validate in diverse populations and establish MCID threshold.

ACKNOWLEDGEMENTS

Funding sources: The National Natural Science Foundation of China (82504330, 82273559), Sichuan Science and Technology Program (2026NSFSC1617), and The Postdoctor Research Fund of West China Hospital, Sichuan University (2025HXBH126).

Data availability statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

IRB approval status: Reviewed and approved by the Institutional Review Board of West China Hospital. (HX2025#1961).

The authors have no conflicts of interest to declare.

REFERENCES

1. Tan J, Almeida LMC, Bewley A, Cribier B, Dlova NC, Gallo R, et al. Updating the diagnosis, classification and assessment of rosacea: recommendations from the global ROSacea COnsensus (ROSCO) panel. *Br J Dermatol* 2017; 176: 431–438. <https://doi.org/10.1111/bjd.15122>
2. Schaller M, Almeida LMC, Bewley A, Cribier B, Del Rosso J, Dlova NC, et al. Recommendations for rosacea diagnosis, classification and management: update from the global ROSacea COnsensus 2019 panel. *Br J Dermatol* 2020; 182: 1269–1276. <https://doi.org/10.1111/bjd.18420>
3. Del Rosso JQ, Tangheiti E, Webster G, Stein Gold L, Thiboutot D, Gallo RL. Update on the management of rosacea from the

- American Acne & Rosacea Society (AARS). *J Clin Aesthet Dermatol* 2020; 13: S17–S24.
4. Gether L, Overgaard LK, Egeberg A, Thyssen JP. Incidence and prevalence of rosacea: a systematic review and meta-analysis. *Br J Dermatol* 2018; 179: 282–289. <https://doi.org/10.1111/bjd.16481>
 5. Ma G, Zhang Y, Gao Q, Yuan X, Zhou Z, Jian D, et al. Gabapentin improves the flushing of rosacea, but not other rosacea symptoms or quality of life: Results from a multicenter, randomized, double-blind, placebo-controlled pilot study. *J Am Acad Dermatol* 2025; 92: 920–922. <https://doi.org/10.1016/j.jaad.2024.12.003>
 6. Hopkinson D, Moradi Tuchayi S, Alinia H, Feldman SR. Assessment of rosacea severity: a review of evaluation methods used in clinical trials. *J Am Acad Dermatol* 2015; 73: 138–143. <https://doi.org/10.1016/j.jaad.2015.02.1121>
 7. Wienholtz NKF, Thyssen JP, Christensen CE, Thomsen SF, Karmisholt KE, Jemec GBE, et al. Validity and reliability of the Rosacea Area and Severity Index: a novel scoring system for clinical assessment of rosacea severity. *J Eur Acad Dermatol Venereol* 2023; 37: 573–580. <https://doi.org/10.1111/jdv.18721>
 8. Mattei PL, Corey KC, Kimball AB. Psoriasis Area Severity Index (PASI) and the Dermatology Life Quality Index (DLQI): the correlation between disease severity and psychological burden in patients treated with biological therapies. *J Eur Acad Dermatol Venereol* 2014; 28: 333–337. <https://doi.org/10.1111/jdv.12106>
 9. Jacobson ME, Morimoto RY, Leshem YA, Howells L, Williams HC, Grinich E, et al. The Eczema Area and Severity Index: an update of progress and challenges in its measurement of atopic dermatitis after 20 years of use. *J Eur Acad Dermatol Venereol* 2025; 39: 70–85. <https://doi.org/10.1111/jdv.20248>
 10. Alexis AF, Callender VD, Baldwin HE, Desai SR, Rendon MI, Taylor SC. Global epidemiology and clinical spectrum of rosacea, highlighting skin of color: review and clinical practice experience. *J Am Acad Dermatol* 2019; 80: 1722–1729. <https://doi.org/10.1016/j.jaad.2018.08.049>
 11. Taylor SC. Skin of color: biology, structure, function, and implications for dermatologic disease. *J Am Acad Dermatol* 2002; 46: S41–62. <https://doi.org/10.1067/mjd.2002.120790>
 12. Berardesca E, Maibach H. Racial differences in skin pathophysiology. *J Am Acad Dermatol* 1996; 34: 667–672. [https://doi.org/10.1016/s0190-9622\(96\)80070-3](https://doi.org/10.1016/s0190-9622(96)80070-3)
 13. Goh CF. Diversity of Asian skin: a review on skin biophysical properties. *Exp Dermatol* 2024; 33: e14959. <https://doi.org/10.1111/exd.14959>
 14. Gomez-Lara AR, Zakaria A, Sanchez-Anguiano ME, Amerson EH. Rosacea prevalence, severity, and phenotype by race, ethnicity, and gender: a cross-sectional study of a diverse patient cohort within a primary care population. *JAAD Int* 2026; 24: 338–341. <https://doi.org/10.1016/j.jdin.2025.11.016>
 15. Pan Y, Jia K, Yan S, Jiang X. Effectiveness of VISIA system in evaluating the severity of rosacea. *Skin Res Technol* 2022; 28: 740–748. <https://doi.org/10.1111/srt.13194>
 16. Sedaghat AR. Understanding the Minimal Clinically Important Difference (MCID) of patient-reported outcome measures. *Otolaryngol Head Neck Surg* 2019; 161: 551–560. <https://doi.org/10.1177/0194599819852604>