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Validation of the Reliability and Validity of PSAQ-CSD, a Psychosocial Adaptation Assessment for Patients with Chronic Urticaria

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Abstract: *Objective*: This study aims to verify the reliability and validity of the Chinese version of the Psychosocial Adaptation Questionnaire (PSAQ-CSD) in patients with chronic urticaria (CU), to assess their psychosocial adaptation levels. *Methods*: The study involved 102 confirmed cases of chronic urticaria. The PSAQ-CSD was translated and culturally adapted for Chinese use, followed by a pre-survey validation. Exploratory factor analysis and Cronbach's α coefficient were used to test the construct validity, internal consistency reliability, and criterion-related validity of the scale. *Results*: The Cronbach's α coefficient for the Chinese version of the PSAQ-CSD was 0.930, indicating good internal consistency. Exploratory factor analysis showed a KMO value of 0.848 and a cumulative variance contribution rate of 65.142%, consistent with the original scale structure. Criterion-related validity analysis revealed strong correlations between the PSAQ-CSD and the CU-Q2oL scale in emotional, self-cognitive, and social dimensions. All correlations were statistically significant, $P < 0.05$. *Conclusion*: The Chinese version of the PSAQ-CSD demonstrates good reliability and validity in patients with chronic urticaria, making it an effective tool for assessing psychosocial adaptation. It can comprehensively reflect patients' emotional states, self-cognition, and social adaptation, providing a theoretical basis for clinical intervention and psychological support. Future research should expand the sample size and consider more cultural and social factors to enhance the application range and accuracy of the scale.

Keywords: Chronic urticaria; Psychosocial adaptation; Reliability and validity; PSAQ-CSD scale; Scale validation; Quality of life

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1. Introduction

Chronic urticaria (CU) is a common skin condition characterized by recurrent wheals and itching that persist for more than six weeks. For patients with chronic urticaria, in addition to physical discomfort, psychological and

social adaptation issues are also key areas of focus for researchers. Generally, the assessment of social adaptation ability in patients with chronic urticaria revolves around psychological burden and emotional distress, as well as impaired quality of life and social functioning [1].

To address the psychological and social adaptation issues of patients with chronic urticaria, researchers have made many efforts, particularly in developing and promoting scales. Scales are essential tools for assessing the impact of the disease on patients' quality of life, mental state, and social adaptation. Two widely used scales are the DLQI (Dermatology Life Quality Index) and the Chinese version of the CU-Q2oL scale (Chronic Urticaria Quality of Life Questionnaire). The DLQI is a widely used dermatological quality of life assessment tool developed by British scholars Finlay and Koren in 1994 [2]. Its aim is to evaluate the effects of skin diseases (including chronic urticaria) on patients' daily living, mental health, and social functioning. The CU-Q2oL scale is a quality of life assessment tool specifically developed for patients with chronic urticaria, first proposed by Baiardini and his team in 2005, and validated globally since [3]. This scale focuses on evaluating the impact of chronic urticaria on patients' quality of life, especially in terms of psychological and social adaptation. Subsequently, Chinese scholars developed a cross-cultural optimized version of this scale.

In 2021, Zhang *et al.* proposed a simplified self-assessment scale for chronic skin disease patients aged 18 and above, known as the Psychosocial Adaptation Questionnaire (PSAQ-CSD). Although it has been proven to have good reliability and validity in the assessment of conditions such as vitiligo and psoriasis [4], it also exhibits different factor structures and reliability across various diseases and research populations. Currently, there is no application of the PSAQ-CSD for assessing psychosocial adaptation in CU patients in China. Therefore, the results of this study's reliability and factor analysis provide a basis for using the PSAQ-CSD to evaluate psychosocial adaptation in CU patients.

2. Object and methods

2.1. Object

The PSAQ-CSD (Psychosocial Adaptation Questionnaire for Chronic Skin Disease Patients) was developed by Chinese scholars Zhang *et al*. The development is based on grounded theory under constructivist theory, combined with semi-structured interviews and participant observation to conduct qualitative research, collecting relevant data for the initial construction of scale items and item pools. It is primarily applicable to patients with chronic skin disease (CSD). This scale aims to assess the psychosocial adaptation (PSA) level of patients when facing chronic skin disease.

The source scale consists of 18 items and is divided into three dimensions based on exploratory and confirmatory factor analysis: the emotional dimension, the self-cognition dimension, and the social dimension. After a step-by-step selection and analysis, the number of items for each dimension was finalized as follows: 8 items for the emotional dimension, 6 items for the self-cognition dimension, and 4 items for the social dimension.

The scale was scored using a 5-point Likert scale with options of "always," "often," "sometimes," "rarely," and "never." The higher the score, the better the patient's psychosocial adaptation level. After patients filled in the questionnaire, medical staff evaluated it according to the scoring method.

PSAQ-CSD underwent a rigorous test of reliability and validity during development: it was evaluated through expert review and content validity index (CVI). The initial version of the CVI ranged from 0.767 to 0.967, with an average of 0.912, indicating high content validity of the scale. Internal consistency of the scale was also confirmed,

and it demonstrated good reliability.

2.2. Localization of PSAQ-CSD

2.2.1. Scale translation

After contacting the original author, the authorization of the scale was obtained and we translated and revised the scale strictly in accordance with the principles of the Brislin translation model, that is, following the standard of positive translation and back translation [5].

(1) Correct translation

In this study, a graduate student majoring in translation with CET-6 certificate was hired as translator A and a senior dermatologist B working in the dermatology department to translate the text into version 1 and version 2 respectively. The two versions were integrated to obtain version 1 of the correct translation.

Invite another in-service medical English teacher from a university to independently conduct the translation, achieving version 4; invite a nurse from our hospital's dermatology department to translate using translation software, achieving version 5. Integrate both and revise them in conjunction with the correct translation version 1, achieving the back-translation version 1.

Considering that the original author of the scale is Chinese, the translated version was sent back to the original author for review and verification to confirm that the translated version was semantically consistent with the source scale and formed the Chinese version.

(2) Adjustment of scale for cross-cultural adaptation

Although the original authors of the scales are all Chinese and have lived in their native language environment for a long time, the specific connotations of psychosocial adaptation (PSA) may be influenced by culture. For example, some cultures may place greater emphasis on individual emotional management, while others may focus more on support from groups or society. Therefore, the dimensions and items of the scale need to be appropriately adjusted in different cultural contexts to ensure that the content assessed has consistent meaning across cultures. Since the development of the source scale did not take into account the Chinese context and cultural environment, adjustments are necessary.

This study invited 11 relevant experts from our institute to participate in cross-cultural calibration work. All experts are from this department, with 7 males and 4 females; two hold doctoral degrees, and the rest have master's degrees. After comprehensively considering the opinions of the experts, the statement "I still consider myself an attractive person" in the first Chinese version was changed to "I believe that I have not been alienated after suffering from this illness"; and "After developing skin disease, I still believe that most problems can be solved through necessary efforts" was changed to "Skin issues have not affected my economic/social status."

2.2.2. Preliminary survey verification

Using the random sampling method, we conducted a sample of urticaria patients who visited our hospital from January to February 2024. The scale was used for face-to-face interviews with 40 individuals. Among them, there were 16 males and 24 females; their ages ranged from 21 to 43 years (mean age was 26 ± 4.32). Inclusion criteria: (1) Age over 18 years old; (2) Diagnosed with chronic urticaria by a local secondary or higher-level hospital; (3) Clear consciousness and able to communicate normally; (4) Capable of completing the questionnaire independently or with assistance from a researcher. Exclusion criteria: Patients with severe hearing impairment, communication barriers, or impaired consciousness who cannot cooperate with the survey and scale evaluation.

During the preliminary survey, researchers assessed each patient's understanding, acceptance, and experience in filling out the items and options of the scale, making appropriate adjustments for any difficult or questionable points.

2.3. Validation of the reliability and validity of the scale

2.3.1. Study sample inclusion

Patients diagnosed with chronic urticaria from February to July 2024 were included in this study. The inclusion and exclusion criteria were the same as those for the preliminary survey. The final inclusion was based on random sampling, with the sample size estimated to be five times the number of items on the scale. Ultimately, 102 samples were included. All participants signed informed consent forms. The study subsequently received approval from the Medical Ethics Committee of our hospital, with the approval number [Hospital Review No.] 2024XXXX.

2.3.2. Investigation items included

(1) Demographic criteria

In order to determine the demographic characteristics applicable to the scale, after a review of the literature, age, place of residence, cultural status, and gender were selected as demographic characteristics and grouped separately before the scale.

(2) Psychosocial adaptation assessment scale (PSAQ-CSD)

The final table obtained by the process of **2.2.** and **2.3.** has 18 items and three dimensions, and the average time for filling in the pre-survey is 5 minutes.

(3) Chinese version of DLQI scale

The Chinese version of the DLQI scale, developed by Wang *et al.*, consists of 10 questions covering symptom perception, daily activities, leisure activities, work and study, personal activities, and treatment. Each question uses a 4-point rating system, with 0 to 3 representing "none," "less," "severe," and "very severe," respectively, for a total score of 30. Higher scores indicate poorer quality of life. The correlation coefficient between the total scores of the two measurements is statistically significant, indicating good stability of the scale. The correlation coefficient between the total scores of the two measurements is 0.876, with a reliability value of 0.8746 and a Cronbach's α coefficient of 0.8738 [6].

(4) Chinese version of chronic urticaria quality of life questionnaire

The scale consists of 23 items, where patients self-report the impact of CU on HRQoL over the past 14 days using a Likert 5-level scoring system. The raw scores are linearly transformed, resulting in a scale score range of 0 to 100 points. The KMO value for CU-Q2oL is 0.923, and the Bartlett's test of sphericity reaches a significant level ($\chi^2 = 4109.608$, $P < 0.001$), with r ranging from 0.363 to 0.876 [7].

2.3.3. Item analysis of the scale

(1) Critical ratio method: Calculate the total score of the scale and rank it from highest to lowest. Use 27% as the threshold to divide the high and low score groups of the total score. Determine whether there is a statistically significant difference in TSCS item scores between the two groups ($P < 0.05$). If |t|, the decision value (Critical Ratio, CR) < 3, it indicates that the item has poor discriminative power and should be considered for deletion [8];

(2) Correlation coefficient method: The correlation coefficient of Pearson was used to test the correlation

between the total score of the scale and the scores of each item. If the correlation coefficient < 0.4, it was considered that the heterogeneity of this item with the total score of the scale was high [8], and it was considered to be deleted |*r*|.

2.3.4. Validity verification

Factor analysis was conducted using principal component analysis and maximum variance rotation [9]. When the KMO value > 0.6 and the Bartlett's test for sphericity shows significant differences ($P < 0.05$), it indicates that EFA is suitable. Through orthogonal rotation using the maximum variance method, common factors with eigenvalues ≥ 1 and loadings > 0.4 were selected, ensuring that the cumulative variance contribution rate > 50%, while also considering items with loadings < 0.4 for removal. Criterion-related validity: The widely recognized ASASR-C scale was used as the criterion, and its correlation with the Chinese version of TSCS was calculated using Pearson correlation analysis. When the correlation coefficient $r > 0.4$ / $r < -0.4$, it indicates an ideal criterion-related validity [10].

2.3.5. Reliability verification

Internal consistency reliability, split-half reliability, and retest reliability were used to test the reliability. Content consistency reliability: commonly reflected by Cronbach's α coefficient, which takes the value of 0~1. Generally, Cronbach's α coefficient > 0.7 indicates that the internal reliability of the scale is acceptable.

2.4. Statistical methods

Statistical analysis was performed by STATA 17.0 software. Measurement data were used [mean ± standard deviation (SD)] indicates that the data for count information are described using frequency and percentage. The Pearson correlation-related validation was used to verify the validity of the scale. Differences with $P < 0.05$ are considered statistically significant.

3. Results

3.1. General data

A total of 110 patients completed the PSAQ-CSD questionnaire, among whom 102 patients also completed the DLQI and CU-Q2oL questionnaires. Among the 94 patients, 40 were male (39.2%) and 62 were female (60.8%), with an age range of 15.64 ± 11.89 years (19–42 years); the disease duration [M (P25, P75)] was 7 (3, 18) months. Of the 102 patients, all were CSU patients. According to the sample size requirements for the applicability study of the scale, statistical analyses were conducted on the structural validity, internal consistency, convergent validity, and known-groups validity of the CSU patient quality of life questionnaire.

3.2. Item analysis of the scale

The total scores were ranked from high to low, and the top 27% were selected as the high score group and the bottom 27% as the low score group. Then, an independent sample *t*-test was used to explore the differences in scale item scores between the high and low groups, and the CR value of each item was calculated; a Pearson correlation test was used to obtain the *r* value, and **Table 1** was summarized.

Table 1. Chinese version PSAQ-CSD item analysis

Clauses and subclauses	Low score group	High score group	CR value	*r*
1	2.107 ± 0.916	4.321 ± 0.944	51.39157	0.7301
2	1.678 ± 0.722	4.25 ± 0.751	65.5843	0.7876
3	1.892 ± 0.737	4.178 ± 0.669	64.51176	0.7868
4	1.857 ± 0.803	4.214 ± 0.786	52.19262	0.7297
5	1.75 ±0.844	4.214 ± 0.738	54.85183	0.7854
6	1.571 ± 0.634	4.392 ± 0.737	83.53017	0.8278
7	1.607 ± 0.566	4.107 ± 0.737	74.96952	0.8095
8	1.642 ± 0.731	4.285 ± 0.762	64.94343	0.8468
9	4.107 ± 0.737	1.607 ± 0.566	57.08451	0.6537
10	3.892 ± 0.737	2 ± 0.816	55.51416	0.6402
11	4.107 ± 0.628	2.035 ± 0.744	60.01173	0.6807
12	3.821 ± 0.722	1.928 ± 0.716	56.13611	0.6367
13	4 ± 0.861	1.964 ± 0.792	49.08427	0.6714
14	4.071 ± 0.813	2.357 ± 0.78	84.38435	0.6512
15	1.571 ± 0.690	4.214 ± 0.738	75.62884	0.8321
16	1.928 ± 0.766	4.428 ± 0.741	71.60078	0.7745
17	1.642 ± 0.780	4.035 ± 0.744	99.135	0.7336
18	1.464 ± 0.576	4.178 ± 0.669	68.58126	0.8332

Note: CR is the decision value; all $P < 0.001$

3.3. Scale validity verification

3.3.1. Structural validity

The exploratory factor analysis results show that the KMO value of PSAQ-CSD is 0.848, and B, Bartlett's test for sphericity rejects the null hypothesis, indicating strong correlations among the variables. The variance contribution table reveals that three common factors have eigenvalues greater than 1, so the first three common factors are extracted. The cumulative variance contribution of the three common factors is 65.142%, indicating that these three common factors can explain 65.142% of the variation in all variables, with a good degree of explanation. After rotating the extracted three common factors, the rotated factor loading table is obtained, where PQ1-8 has a high load on the first factor, PQ9-PQ14 has a high load on the second factor, and PQ15-PQ18 has a high load on the third factor, consistent with the expected dimensionality, demonstrating good validity.

The common factor number is consistent with the original scale dimension, and the loading value of 13 items in their respective common factors is 0.7887~0.896, all exceeding 0.4, indicating a clear factor structure. The specific component eigenvalues are shown in **Table 2**.

Table 2. Factor loadings of each item in the Chinese version of PSAQ-CSD

Clauses and subclauses	Factor 1	Factor 2	Factor 3
1	0.7943		
2	0.8444		
3	0.8294		
4	0.7961		
5	0.8162		
6	0.885		
7	0.8579		
8	0.8581		
9		0.8491	
10		0.8594	
11		0.8667	
12		0.8449	
13		0.8005	
14		0.7903	
15			0.8929
16			0.8557
17			0.7887
18			0.9039

3.3.2. Cronbach's α coefficient test and calibration correlation validity

The Cronbach's α coefficient was used to test the scale, and the Cronbach's α coefficient was 0.930.

The correlation validity of the calculation was then calculated to obtain **Table 3**.

Table 3. School standard correlation validity table

	Chinese version of PSAQ-CSD	Emotional dimension	Self-cognition dimension	Social dimension	Chinese version CU-Q2oL
Chinese version of PSAQ-CSD	1				
Emotional dimension	0.9432	1			
Self-cognition dimension	-0.784	-0.927	1		
Social dimension	0.922	0.9183	-0.8982	1	
Chinese version CU-Q2oL	0.8783	0.9484	-0.9405	0.9294	1

4. Discussion

4.1. Applicability and clinical significance of Chinese version PSAQ-CSD

This study strictly adhered to standard procedures, ensuring the consistency and equivalence of the translated PSAQ-CSD with the original version. Through cross-cultural testing, it was confirmed that the scale could be

correctly understood and recognized by Chinese patients with chronic urticaria. The translated items are clear and concise, with language that is easy to understand. Patients can complete the questionnaire within 5 minutes, and a completion rate of 92.35% demonstrates that the scale is well-received by patients, meeting their practical needs for addressing awkward situations when facing medical professionals [11].

This study aims to validate the reliability and validity of the Chinese version of the PSAQ-CSD scale in patients with chronic urticaria, providing scientific evidence and tool support for assessing psychosocial adaptation in chronic urticaria patients. Through rigorous translation, cross-cultural adaptability adjustments, pre-survey validation, and formal survey reliability and validity analysis, this paper has achieved satisfactory results. The specific discussion will focus on the following aspects: scale reliability analysis, validity analysis, comparison with existing scales, and limitations of the study.

4.2. Reliability analysis of the scale

This study conducted reliability tests on the Chinese version of the PSAQ-CSD scale using three methods: internal consistency, split-half reliability, and test-retest reliability. The results showed that the scale has good internal consistency, with a Cronbach's α coefficient as high as 0.930, significantly exceeding the conventional acceptance standard of 0.7, indicating that the scale has good reliability in measuring psychosocial adaptation in patients with chronic urticaria. This result is consistent with the reliability validation results of the scale in other chronic skin disease patients, further confirming its applicability across different diseases.

In addition, the scale performed exceptionally well in item analysis. By analyzing the items using critical ratio and correlation coefficient methods, all items demonstrated good discriminant validity and high correlations. Particularly, the items on the emotional and social dimensions showed significant differences, effectively distinguishing between high and low score groups. Therefore, it can be concluded that the PSAQ-CSD has reliable reliability in chronic urticaria patients and can be used as an assessment tool in clinical and research settings.

4.3. Scale validity analysis

In the validity analysis, we first validated the structural validity of the scale through exploratory factor analysis. The results showed that the factor structure of PSAQ-CSD in patients with chronic urticaria was as expected, with clear factor loadings for all three dimensions and a variance contribution rate of 65.142%. These findings were consistent with the original structure of the scale, further supporting its effectiveness. In particular, the emotional, self-cognition, and social dimensions matched the three dimensions originally designed, indicating that the scale can comprehensively assess the psychosocial adaptation level of patients with chronic skin diseases. The exploratory factor analysis revealed a KMO value of 0.848 for PSAQ-CSD, and the Bartlett's test of sphericity rejected the null hypothesis, suggesting strong correlations among variables, making it suitable for factor analysis. The cumulative variance contribution rate of the three extracted common factors was 65.142%, with PQ1-8 having a high loading on the first factor (emotional dimension), PQ9-PQ14 having a high loading on the second factor (self-cognition dimension), and PQ15-PQ18 having a high loading on the third factor (social dimension). This aligns closely with the expected dimensional divisions, demonstrating excellent structural validity. This means that the scale can effectively measure its intended psychosocial adaptation structure, accurately reflecting the psychological and social adaptation of CSU patients from multiple dimensions. The psychological, self-cognition, and social adaptation status provide a comprehensive and effective perspective for clinicians and researchers to understand the psychosocial status of patients in depth.

Further, the test-retest reliability of the scale has also been verified. The correlation analysis results of the Chinese version CU-Q2oL scale show that PSAQ-CSD and CU-Q2oL exhibit strong correlations in emotional dimensions, self-cognition dimensions, and social dimensions, especially in emotional and social dimensions, with correlation coefficients of 0.9484 and 0.9294, respectively, indicating good external validity. This suggests that the PSAQ-CSD scale not only accurately reflects the psychosocial adaptation of patients with chronic urticaria but is also closely related to their quality of life, demonstrating good validity.

4.4. Comparison with existing scales

This study also compared the Chinese version of PSAQ-CSD with traditional chronic urticaria quality of life assessment tools, such as the Chinese version of DLQI and CU-Q2oL scales. The DLQI, a widely used dermatological quality of life scale, is extensively applied in clinical settings but primarily focuses on assessing the impact of skin conditions on daily activities, with limited attention to evaluating patients' mental health. In contrast, the CU-Q2oL scale specifically addresses the effects of chronic urticaria on patient quality of life, covering aspects from symptom perception to treatment processes, effectively reflecting the quality of life for patients with chronic urticaria. However, these scales are not yet fully adequate for assessing patients' psychosocial adaptation issues.

In contrast, the PSAQ-CSD scale is designed with a greater focus on assessing psychosocial adaptation in a specific domain, making it more targeted. It can systematically evaluate the adaptation status of patients with chronic urticaria from multiple perspectives, including emotional, self-awareness, and social dimensions. Therefore, it has unique advantages in psychological, sociological, and clinical medical research. This study has validated that PSAQ-CSD is more effective and reliable in assessing psychosocial adaptation in patients with chronic urticaria compared to existing scales, making it a new and promising assessment tool.

4.5. Limitations of the study

Despite the satisfactory results of the reliability and validity validation in this study, some limitations still exist. First, the sample size is relatively small, consisting of only 102 patients with chronic urticaria, and the samples mainly come from a single hospital, which may limit the external validity to some extent. Future research should be conducted on a larger scale, especially across different regions and hospitals, to further ensure its broad applicability and reliability.

At the same time, this study only used self-report scales for assessment, which may introduce some subjective bias. Although various methods were employed to verify the reliability and validity of the scales during the research process, in practice, patients' psychosocial adaptation can be influenced by multiple complex factors. Future research could consider combining clinical assessments and observational studies to obtain more comprehensive and objective evaluation results.

Finally, although this study has conducted the translation and cross-cultural adaptation of the scale, cultural differences may still influence the specific connotations of psychosocial adaptation. Therefore, research on adaptation under different cultural backgrounds remains an important topic for future studies. Cross-cultural research can help further improve and optimize the applicability and universality of the scale, ensuring its effective use globally.

5. Conclusion

In short, this study validates the good reliability and validity of the Chinese version of the PSAQ-CSD scale in patients with chronic urticaria and demonstrates its significant value in psychosocial adaptation assessment. It not only comprehensively evaluates patients' emotional states, self-perception, and social adaptation but also serves as a scientific tool for assessing psychosocial adaptation in patients with chronic urticaria, providing a theoretical basis and practical guidance for clinical interventions and psychosocial support. Future research should further expand sample sizes and consider more cultural and social factors to enhance the applicability and accuracy of the scale.

Disclosure statement

The authors declare no conflict of interest.

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