


ORIGINAL ARTICLE

Translation and validation of 17-item Wound-QoL questionnaire in a Chinese population

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Funding information

Youth Clinical Research Project of Peking University First Hospital, Grant/Award Number: 2017CR13

Abstract

We aimed to translate the 17-item questionnaire to measure the quality of life of patients with chronic wounds (Wound-QoL-17) and verify its reliability and validity in the Chinese population. The standard Chinese version of the Wound-QoL-17 was determined through translation, back translation, and cultural adaptation. A total of 121 patients with chronic wounds from the wound center of a tertiary hospital in Beijing were recruited. Through a questionnaire and physical examination, we tested the criterion-related validity, known group validity, structural validity, internal consistency coefficient (Cronbach's alpha), and test-retest correlation. A new structure of four factors was extracted by exploratory factor analysis, and the cumulative contribution rate was 72.23%. The total score and that of the four factors, which were significantly correlated with the EuroQoL Five Dimensions Questionnaire (EQ-5D) and the Short Form-36 Health Survey (SF-36) ($P < 0.05$), also showed statistically significant differences between patients with different pain grades, with or without wound odour, and between different groups of patients reporting wound changes in the past 2 weeks. Cronbach's alpha was between 0.779 and 0.906, while the test-retest reliability was between 0.532 and 0.802. We concluded that the Chinese Wound-QoL-17 has good reliability and validity and is suitable for evaluating the quality of life of patients with chronic wounds.

KEYWORDS

chronic wound, quality of life, reliability, validity

Key Messages

- we translated and tested the reliability and validity of the Standard Chinese Wound-QoL-17
- the Chinese Wound-QoL-17 was found to have four factors, correlated well with EQ-5D and SF-36, as well as good known group validity
- the Chinese Wound-QoL-17 has high internal consistency and reasonable test-retest reliability

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- the Chinese Wound-QoL-17 can be used for patients who are literate. The four-factor structure is more suitable for the Chinese population, and the Three-factor structure of the original scale is suggested for transnational research

1 | INTRODUCTION

A chronic wound is one that cannot achieve anatomical and functional integrity through normal, orderly, and timely repair process, and could not achieve anatomical and functional integrity.¹ Clinically, the term usually refers to a wound that has been treated for more than one month without any signs of healing.¹ A meta-analysis of observational studies conducted by Martinengo et al. showed that the combined prevalence of chronic wounds with mixed aetiology in the general population was as high as 2.21%.² Although the prevalence of chronic wounds varies worldwide, they have become a common problem affecting patients' quality of life whilst consuming a lot of medical expenses and social resources.³ Thus, there is an urgent need to comprehensively evaluate their impact to improve patients' quality of life. The generic assessment tools for quality of life, commonly used for chronic wounds, include the Nottingham Health Profile (NHP),⁴ the Medical Outcomes Study Short-Form 36 (SF-36),⁵ the EuroQol Five Dimensions Questionnaire (EQ-5D),⁶ and the World Health Organisation Quality of Life-bref (WHOQOL-bref).⁷ The specific tools for wounds-related quality of life are the Freiburg Life Quality Assessment (FLQA-W),⁸ the Cardiff Wound Impact Schedule (CWIS),⁹ and the Würzburg Wound Scale (WWS).¹⁰ The common problem with the generic tools lies in the lack of measurement for wound-specific impact, whereas with wound-specific tools it refers to incomplete dimensions or lengthy scales. To compensate for these defects, Blome et al. developed the Wound-QoL based on the above three wound-specific tools.¹¹ It was designed to assess the quality of life of patients with chronic wounds and has been translated and verified in numerous countries in Europe and North America.¹²⁻¹⁶ However, it has not been verified and applied to the Chinese population. This study aims to translate the Wound-QoL questionnaire and verify its reliability and validity in the Chinese population to provide an effective evaluation tool for clinical and scientific research.

2 | METHODS

2.1 | Sample and recruitment

This descriptive cross-sectional study was conducted between July 2019 and June 2021. Using convenient

sampling methods, patients were recruited from the wound center of the Peking University First Hospital, a tertiary educational hospital in Beijing, China. Data were collected using questionnaires and physical examination. The initially targeted sample size was 85–340, as exploratory factor analysis requires a sample size to be 5–20 times¹⁷ the number of questionnaire items. When the actual sample size reached 121 cases, the Kaiser–Meyer–Olkin (KMO) and Bartlett's test indicated that $KMO = 0.875$, $\chi^2 = 1248.017$, $df = 120$, $P < 0.01$, suggesting that this sample size was suitable for exploratory factor analysis; therefore, we stopped data collection. Inclusion criteria included (1) a diagnosis of chronic wound at least 1 month prior to study enrollment, (2) age ≥ 18 years, and (3) provision of written informed consent. Patients who had mental illnesses, who were unable to fill in the questionnaire independently or answered the questions orally were excluded from the study.

After arriving at the clinic, the patients who met the inclusion criteria were recruited. The purpose, significance, and procedures of the study were explained to them, and written informed consent was obtained before enrollment. The researchers measured the wounds and collected disease-related data during dressing changes. The participants were then asked to fill out the questionnaires by themselves or with the help of the researchers. All the above processes were completed during the same visit.

To avoid real changes happening between two consecutive measurements, the original author suggested 3–7 days interval for test–retest reliability.¹⁸ However, in general, the interval of the test–retest reliability of the quality of life questionnaire was more than 7 days, usually 7–14 days.¹⁹⁻²¹ Thus, to avoid recalling the answers to the previous measurement still available for the participants, we chose a interval of 7–14 days. Additionally, we selected patients who reported no change compared with 2 weeks prior to the second measurement (20 patients, see Table 1) to ensure the stability of the participants' condition.

Ethical approval (IRB# 2017[1302]) was obtained from the Peking University First Hospital Ethics Committee.

2.2 | Demographic and disease-related data

Demographic and disease-related data were collected using a self-designed questionnaire. Demographic data

TABLE 1 Demographic and Clinical data (N = 121)

Variables	n(%)
Gender	
Male	68(56.2)
Female	53(43.8)
Marital status	
Live with spouse	87(71.9)
Live without spouse	34(28.1)
Education level	
Primary school or below	7(5.8)
Junior middle school	30(24.8)
Senior high school	22(18.2)
Junior college	14(11.6)
Undergraduate or above	48(39.7)
Monthly income per capita	
<¥3000 ^a	12(10.0)
¥3001-¥5000	27(22.3)
≥¥5001	82(67.8)
Residence	
Urban	111(91.7)
Rural	10(8.3)
Lives alone	
No	84(69.4)
Yes	37(30.6)
Job status	
Employed	47(38.8)
Unemployed	14(11.6)
Retired	60(49.6)
Payment for medical expenses	
Medical insurance	95(78.5)
Free medical care	10(8.3)
Own expense	12(9.9)
New rural cooperative medical insurance	4(3.3)
Wound aetiology	
Diabetic foot	35(28.9)
Trauma	18(14.9)
Abscess	18(14.9)
Post-operation wound healing defect	16(13.2)
Venous ulcer	8(6.6)
Malignant tumour	5(4.1)
Pressure Injury	3(2.5)
Scar ulcer	3(2.5)
Gangrenous pyoderma	2(1.7)
Burn	2(1.7)
Wound of unknown aetiology	8(6.6)

(Continues)

TABLE 1 (Continued)

Variables	n(%)
Other atypical wounds ^b	3(2.5)
Wound location	
Head, face and neck	8(6.6)
Chest and abdomen	17(14.0)
Back, waist and sacrococcygeal	10(8.3)
Arms and hands	9(7.4)
Legs	34(28.1)
Feet	43(35.5)
Wound exudate	
Dry	19(15.7)
Moist	71(58.7)
Wet	23(19.0)
Saturate	5(4.1)
Leakage	3(2.5)
Wound odour	
No odour	100(82.6)
Slight	14(11.6)
Moderate	5(4.2)
Strong	2(1.6)
Wound infection	
Diagnosed infection	29(24.0)
Suspected infection	20(16.5)
No infection	72(59.5)
Patients reporting wound changes	
Significantly improved	47(38.8)
Better than 2 weeks ago	41(33.9)
Same as 2 weeks ago	20(16.5)
Worse than 2 weeks ago	11(9.1)
Seriously deteriorated	2(1.7)
Wound pain	
Mild (NRS 0–3)	91(75.2)
Moderate (NRS 4–7)	21(17.4)
Severe (NRS 8–10)	9(7.4)

^a¥Renminbi(RMB)Chinese currency 1¥ ≈ US \$ 0.157.^bOther atypical wounds include arterial ulcers (0.8%), pilonidal sinuses (0.8%), and dermatomyositis-related ulcers (0.8%).

included patients' gender, marital status, education level, monthly income per capita, place of residence, living alone or not, working status, and payment method for medical expenses.

Disease-related data included wound aetiology, wound location, wound duration (by month), exudation, wound odour, infection, pain level, and, patients

reporting wound changes in the past 2 weeks. To assess wound odour, we adopted Haughton's²² method which divides the severity of the odour into four levels: strong, moderate, slight, and no odour. "Strong" refers to odour that was evident upon entering the room with the dressing intact, which is about 6–10 ft from the patient; "moderate" describes odour that was evident at similar distance as the "strong" with the dressing removed; "slight" refers to odour that was evident "at close proximity to the patient" with the dressing removed; and "no odour" is when no odour was detected even standing by the patient's side with the dressing removed.²² Infection was determined based on bacterial culture. Wounds with positive results were diagnosed with infection; ones with negative results in bacterial culture, yet with local redness, swelling, heat, pain, or purulent secretion were considered suspicious infection, and wounds other than the above two situations were considered infection-free. The last question referred to the patients' feelings about the wound tendency change in the last two weeks, with results divided into five levels: serious deteriorated, worse, no change, better, and significantly improved. We also adopted the numerical rating scoring (NRS) method (score 0–10)²³ to assess the severity of wound pain during the past 24 h, where 0–3 indicated mild pain, with 4–7 as moderate, and 8–10 as severe.

2.3 | Development of the Chinese Wound-QoL

The original Wound-QoL was developed in 2014 by German scholars Blome et al.,⁶ based on the FLQA-W, the WWS, and the CWIS. The 17-item questionnaire was used to evaluate the influence of chronic wounds on the patients' quality of life. The Likert 5 scoring system (0–4) was adopted to indicate the impairment of life quality, with "0" indicating "not at all" and "4" indicating "very much." The questionnaire includes three subscales: the body subscale (items 1–5), the psyche subscale (items 6–10), and the day life subscale (items 11–16). Item 17, regarding the financial burden, does not belong to any subscale. The average score for each item was used to calculate the total and subscale scores. A higher score, therefore, indicates lower life quality. Cronbach's alpha of the questionnaire and the three subscales were between 0.85 and 0.92,²⁴ having a strong correlation with the EQ-5D ($r = 0.65$). The average responding time was 2.4 min.²⁴

After obtaining translation authorization from the original author (English version),¹³ we translated it into the Standard Chinese version according to the international guideline,²⁵ following six steps: ① Two individuals (master of nursing specialist, MNS) fluent in both Chinese and

English served as forward translators. They both independently translated the English version of the questionnaire into Chinese. ② The research team compared and merged the two Chinese translations to form a consensus version. ③ Other two bilingual individuals (MNS), who had not seen the original English version before, translated the Chinese consensus version back into English. ④ The researcher team compared it with the original English version to determine the differences and revised the Chinese consensus version. ⑤ At the request of the original author, we requested a professional translation institution (Editage) to repeat the forward translation. ⑥ The original author also had a German translation institution redone-back translation. Finally, the researcher discussed separately each questionnaire item with the original author and the German translator via teleconference to form the test version. The test version was sent to 10 chronic wounds patients with different educational levels, with all 10 confirming that they could read and understand the meaning of all items. Finally, the determined version of the Wound-QoL was completed (Figure 1).

2.4 | Generic quality of life questionnaires

The EQ-5D and the SF-36 Health Questionnaire were used as the validation criteria. In the original validation study, Augustin et al.²⁴ used the 3-level version of the EQ-5D (EQ-5D-3L) as a criterion for construct validation. The EQ-5D-3L⁶ included a health description system and a visual analog scale (EQ-VAS). The health description system contained five questions regarding mobility, self-care, usual activities, discomfort/pain, and anxiety/depression. Each question included three severity levels: no problems, some problems, and extreme problems. We calculated the EQ-5D-3L score using the Chinese EQ-5D-3L utility value system²⁶ developed and verified by Liu et al., with a value range of -0.149 to 1.000 . Higher scores indicate better health-related quality of life. The EQ-VAS is a vertical visual scale with a length of 20 cm. Patients were asked to mark their current health state on a scale ranging from 0 to 100, with "0" indicating "worst health state" and "100" "best health state."⁶ The EQ-VAS score regarding life quality was sensitive to fluctuations.

Because the EQ-5D is not widely used in China, to facilitate the comparison among the local population, we adopted another generic tool, the SF-36, as a criterion for validation, as it is more common in China. The SF-36 was designed by the Medical Outcomes Study to measure general health status.⁵ Nowadays it is adopted in different languages in more than 40 countries. The scale includes 36 items and eight dimensions, which evaluate eight

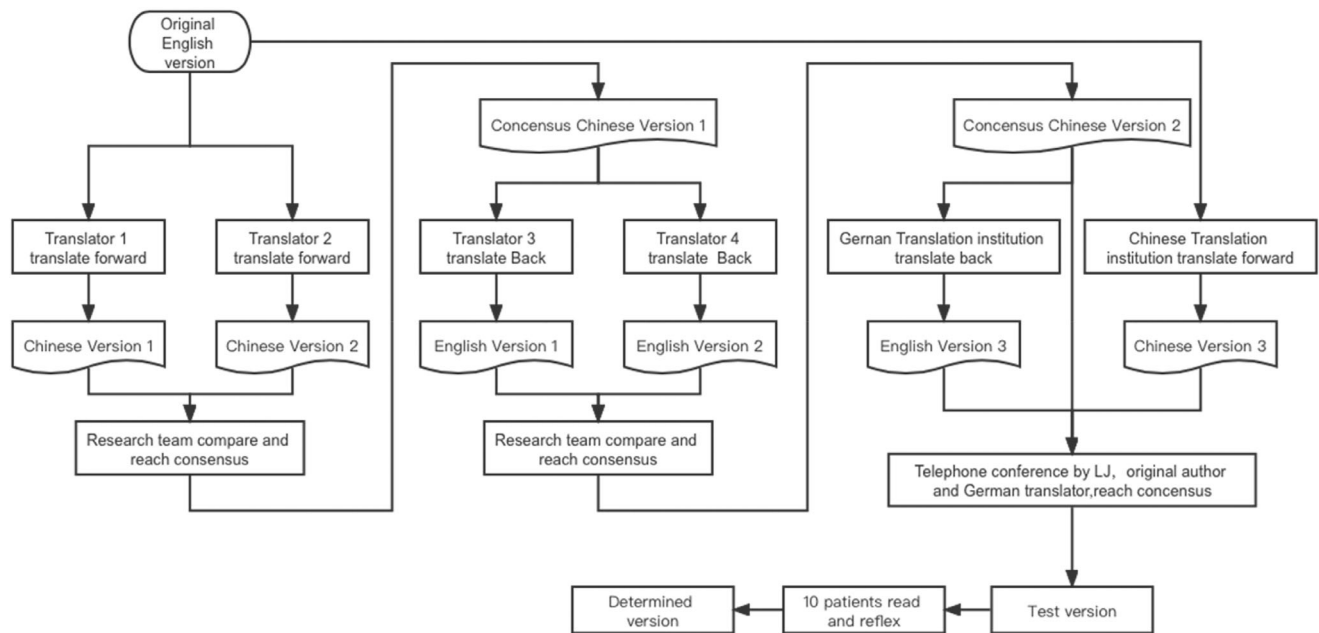


FIGURE 1 Flow chart of translation procedure

aspects of health status, namely: physical function, role physical, body pain, general health, vitality, social function, role emotional, and mental health. Since the late 1990s, it has been widely used in China as a generic assessment tool for QoL.

2.5 | Reliability and validity evaluation

The following indicators were used to evaluate the reliability and validity of the Chinese Wound-QoL: ① structural validity was tested using exploratory factor analysis; ② criterion-related validity was reflected by the correlation analysis with EQ-5D-3L and SF-36; ③ known group validity was verified by factor grouping, as follows: grading of pain (moderate or above pain versus mild pain), wound odour (presence versus absence of odour), infection (diagnosed infection or signs of infection versus no infection), and different groups of patients reporting wound changes (improved versus deteriorated)^{27,28}; ④ internal consistency was manifested by Cronbach's alpha; ⑤ correlation analysis of scores in two successive measurements was used to demonstrate test-retest reliability.

2.6 | Data analysis

The original data were analysed using SPSS, version 23.0 (IBM SPSS Statistics for Macintosh, 2015. Armonk, NY: IBM Corp.). Continuous data were expressed as a mean \pm standard deviation (SD) and extreme or median values,

while categorical data were presented as proportions. Exploratory factor analysis was used to verify structural validity, with a factor load ≥ 0.30 as acceptable. The Cronbach's alpha was calculated for internal consistency. Correlation analysis (Spearman) was used to verify the test-retest reliability and criterion-related validity. The Mann-Whitney U test was used to test known group validity.

3 | RESULTS

3.1 | Demographic and clinical characteristics

Table 1 shows the clinical and demographic data of the 121 enrolled patients. The average age was 54.9 ± 18.0 (20–85, median 58) years. The average wound duration was 6.8 ± 18.8 (1–180, median 2) months. The average NRS score of wound pain was 2.4 ± 2.6 (0–10, median 2).

3.2 | Validity of Wound-QoL

Referring to the structure of the original questionnaire, we conducted the KMO and Bartlett test on items 1–16, setting item 17 as a single item. The results showed that $KMO = 0.875$, $\chi^2 = 1248.017$, $df = 120$, $P < 0.01$, indicating suitability for exploratory factor analysis. Adopting the principal component method and orthogonal rotation of the maximum variance, four factors were extracted according to the gravel map: inner body (items 1 and 4),

TABLE 2 Factor load matrix after rotation of Chinese Wound-QoL ($N = 121$)

No.	Item	Inner body	Outer body	Psyche	Daily life
Item 1	...my wound hurt	0.888	0.028	0.154	0.140
Item 4	...the wound has affected my sleep	0.773	0.286	0.270	0.213
Item 2	...my wound had a bad smell	0.183	0.876	0.146	0.098
Item 3	...there was a disturbing discharge from wound	0.038	0.836	0.267	0.208
Item 5	...the treatment of the wound has been a burden	0.142	0.234	0.742	0.274
Item 6	...the wound has made me unhappy	0.166	0.227	0.727	0.438
Item 7	...I have felt frustrated because the wound is taking so long to heal	0.321	0.218	0.671	0.268
Item 8	...I have worried about my wound	0.363	0.326	0.727	0.280
Item 9	...I have been afraid of the wound getting worse or of new wounds appearing	-0.017	0.041	0.700	0.005
Item 10	...I have been afraid of knocking the wound	0.380	-0.010	0.562	0.302
Item 11	...I have had trouble moving about because of the wound	0.044	0.127	0.085	0.865
Item 12	...climbing stairs has been difficult because of the wound	0.080	0.061	0.066	0.852
Item 13	...I have had trouble with day-to-day activities because of the wound	0.260	0.107	0.263	0.769
Item 14	...the wound has limited my leisure activities	0.145	0.090	0.304	0.708
Item 15	...the wound has forced me to limit my activities with others	0.055	0.188	0.302	0.731
Item 16	...I have felt dependent on help from others because of the wound	0.222	0.078	0.196	0.764

KMO = 0.875, $X^2 = 1248.017$, $df = 120$, $P < 0.01$.

	Inner body	Outer body	Psyche	Daily life	Total score
SF36-PF [#]	-0.265**	-0.053	-0.246**	-0.533**	-0.429**
SF36-RP	-0.310**	-0.182*	-0.383**	-0.534**	-0.516**
SF36-BP	-0.612**	-0.165	-0.439**	-0.393**	-0.510**
SF36-GH	-0.334**	-0.229*	-0.375**	-0.428**	-0.468**
SF36-VT	-0.192*	-0.204*	-0.329**	-0.351**	-0.384**
SF36-SF	-0.284**	-0.257**	-0.471**	-0.553**	-0.576**
SF36-RE	-0.241**	-0.111	-0.403**	-0.268**	-0.383**
SF36-MH	-0.216*	-0.179*	-0.351**	-0.237**	-0.338**
SF36-HT	0.310**	0.238**	0.341**	0.352**	0.410**
SF36-Total	-0.407**	-0.215*	-0.518**	-0.583**	-0.625**
EQ-VAS	-0.312**	-0.205*	-0.342**	-0.426**	-0.436**
EQ-5D-3L	-0.387**	-0.146	-0.429**	-0.643**	-0.600**

Note: ** $P < 0.01$, * $P < 0.05$.

Abbreviations: BP, body pain; GH, general health; HT, health transition; MH, mental health; PF, physical function; RF, role emotional; RP, role physical; SF, social function; VT, vitality.

TABLE 3 Correlation coefficient between Chinese version of Wound-QoL and SF-36 and EQ-5D-3L/EQ-VAS ($n = 121$)

outer body (items 2 and 3), psyche (items 5–10), and daily life (items 11–16). The cumulative variance contribution rate was 72.23%. Table 2 presents the results of the exploratory factor analysis.

The four factors and the total scores of the Chinese Wound-QoL were well correlated with most SF-36 subscales and EQ-5D dimensions. The correlation coefficients are listed in Table 3 ($N = 121$).

TABLE 4 Scores of Chinese Wound-QoL in patients from different groups (Mean \pm SD, $N = 121$)

grouping criterion		<i>n</i>	Inner body	Outer body	Psyche	Daily life	Total score
Pain	NRS ≥ 4	30	2.60 \pm 1.18	1.63 \pm 0.93	2.61 \pm 1.11	2.58 \pm 1.13	2.44 \pm 0.91
	NRS < 4	91	1.51 \pm 0.57	1.36 \pm 0.62	2.17 \pm 0.98	2.08 \pm 0.99	1.95 \pm 0.70
<i>t</i>			4.881	1.492	2.028	2.300	3.068
<i>P</i>			<0.001	0.144	0.045	0.023	0.003
Odour	Yes	7	2.43 \pm 1.30	2.57 \pm 1.64	3.45 \pm 1.33	3.40 \pm 1.27	3.18 \pm 1.15
	No	114	1.74 \pm 0.86	1.35 \pm 0.56	2.21 \pm 0.97	2.13 \pm 0.99	2.00 \pm 0.71
<i>t</i>			3.006	1.943	3.212	3.265	2.667
<i>P</i>			0.047	0.099	0.002	0.001	0.036
Infection ^a	Yes	49	2.00 \pm 1.01	1.68 \pm 0.93	2.48 \pm 1.08	2.32 \pm 1.07	2.23 \pm 0.90
	No	71	1.63 \pm 0.79	1.25 \pm 0.45	2.16 \pm 0.98	2.14 \pm 1.03	1.96 \pm 0.68
<i>t</i>			2.233	3.062	1.662	0.947	1.850
<i>P</i>			0.027	0.003	0.099	0.346	0.067
Patients reporting wound changes ^b	Deteriorated ^b	13	2.73 \pm 1.39	2.12 \pm 1.16	3.37 \pm 1.01	3.03 \pm 1.20	2.95 \pm 0.94
	Improved	88	1.57 \pm 0.74	1.33 \pm 0.59	2.06 \pm 0.92	2.10 \pm 0.99	1.91 \pm 0.68
<i>t</i>			2.932	2.402	4.743	3.035	4.875
<i>P</i>			0.012	0.032	<0.001	0.003	<0.001

^aIncludes confirmed and suspected infections.

^b“Deteriorated” patients includes patients reporting “seriously deteriorated” and “worse than 2 weeks ago.” “Improved” patients includes patients reporting “significantly improved” and “better than 2 weeks ago.” There were also 20 patients who felt no change not included in the comparison.

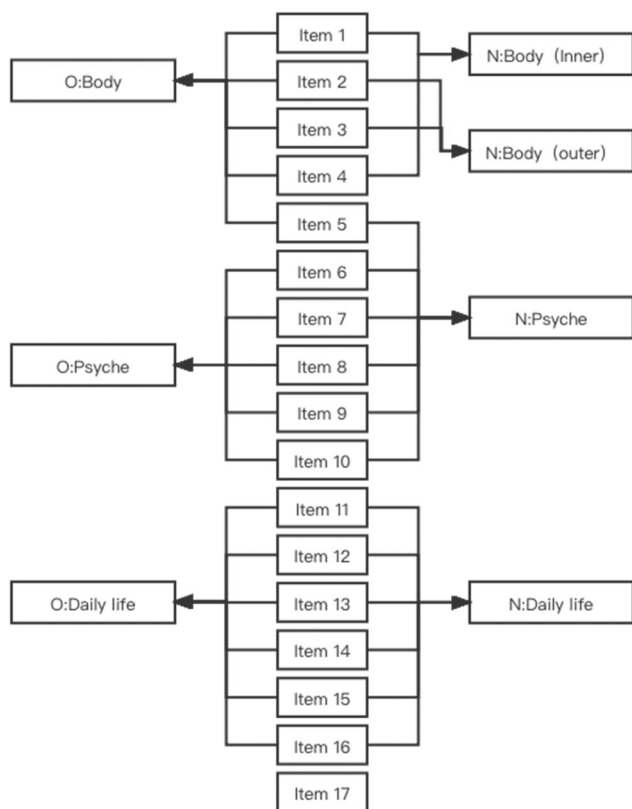


FIGURE 2 Original and new factor Structure change of Chinese Wound-QoL. *O: original, N: new.

Studies^{27,28} have shown that patients' quality of life differs according to the following factors: pain grade, wound types, wound odour, infection, and patients reporting wound changes. Thus, the differences in the Wound-QoL scores between the different groups were compared. Table 4 presents the results.

3.3 | Reliability of the Chinese Wound-QoL

Consistent with the original structure, we tested the Cronbach's alpha and the test-retest correlation of the three-factor structure of the original scale. Cronbach's alpha for all items and the three factors (Body, Psyche, and Daily life) were 0.912, 0.752, 0.804, and 0.906, respectively. The repeated measurement of 20 patient intervals were between 10 and 14 days while the test-retest reliability of all items and three factors (Body, Psyche, and daily life) were respectively 0.674 ($P = 0.01$), 0.571 ($P = 0.009$), 0.851 ($P < 0.001$), 0.690 ($P = 0.001$).

For the four-factor structure derived from the exploratory factor analysis in our study, Cronbach's alpha of the four factors (inner body, outer body, psyche, daily life) were 0.781, 0.779, 0.843, and 0.906, respectively. The test-retest reliabilities of the four factors were 0.619

($P = 0.004$), $0.532(P = 0.016)$, $0.802(P < 0.001)$, and $0.690(P = 0.001)$, respectively.

4 | DISCUSSION

This study aimed to translate the English version of the Wound-QoL-17 into Chinese and verify its reliability and validity within the Chinese context. Through this study, we adopted the standard methods for forward translation, back translation, and cultural adaptation²⁵ and involved the original German author in the translation procedure to retain the original meaning as much as possible. Our data showed that Cronbach's alpha of the questionnaire and the four factors were between 0.779 and 0.906, which are acceptable values compared with the original data of 0.85 to 0.92,²⁴ reflecting high internal consistency. The test-retest reliability of the total score and the four factors was between 0.532 and 0.802, indicating fairly high stability. Compared with the SF-36 and the EQ-5D, a significant correlation was detected in most dimensions (Table 3), which verifies high criterion-related validity. The Wound-QoL score could better distinguish patients with different pain grades, with or without odour or infection, and with different patient-reporting wound changes, which reflects high known group validity. In summary, our data showed that the Chinese version of the Wound-QoL has good internal consistency, acceptable test-retest reliability, and high criterion correlation and known group validities.

Our data identified four factors through exploratory factor analysis: inner body, outer body, psyche, and daily life, which were slightly different from the original factor structure. The original body factor (items 1–5) was separated into three factors, as items 1 and 4 created the inner body factor, items 2 and 3 entered the outer body factor, and item 5 was categorised as the psyche factor (see Figure 2). This change in items can be related to previous studies.^{13,29} When the English Wound-QoL was verified in the United States, it was found that items 2, 3, 10, 12, and 16 contributed less to the corresponding dimensions; thus, a new factor structure was suggested.¹³ Von Stulpnagel et al.²⁹ reanalyzed the data of 1185 patients from six countries and deleted items 10, 12, and 17, while retaining items 2, 3, and 16 for high relevance, and item 5 was retained but not included in any subscales. These studies suggest that items 2, 3, and 5 are relatively unstable and not closely related to their dimensions, which supports the factor changes reported in this study.

In general, the change in items 1–5 could be attributed to the Chinese culture of proprieties. By comparing items 2 and 3 to 1 and 4, we found that items 2 (smell) and 3 (discharge) described more explicit wound symptoms, which could affect patients' appearance and could be noticed by

both patients themselves and others.²⁹ The Chinese greatly value decency in front of others. Thus, compared with pain (item 1) and sleep impairment (item 4), explicit and difficult-to-hide symptoms receive more attention and have a greater impact on individuals in China. We regard this as the reason why items 1–4 fall within two different factors. For item 5, categorised in the psyche factor, the cause might be the Chinese patients' understanding of the term "treatment burden." In Chinese, "burden" is related more to the psychological rather than the physical aspect, and the latter is expressed more often with "suffering." Von Stulpnagel et al.²⁹ also found that item 5 was a generic question rather than one pointing to a certain dimension, so they decided not to assign it to any specific factor group. This suggests that the understanding about item 5 is ambiguous in different languages. In summary, although the factor structure of the Chinese version of the questionnaire has changed, this is mainly a result of China's cultural and linguistic background.

Regarding the application of Wound-QoL, our study mainly included patients able to read and write; however, in the clinical environment, some types of chronic wounds are often accompanied by sensory or consciousness disorders, such as pressure injury. Although 5 patients with pressure injuries were included in our study, they were not representative of the entire population of patients with pressure injuries. Therefore, we suggest that this questionnaire is unsuitable for assessing the quality of life of patients with sensory or consciousness disorders. In these cases, we could refer to the relatives to complete the Wound-QoL rating the quality of life of the patients.³⁰ In addition, considering that the number of cases with different wound types was uneven in this study, we suggest verifying it in a wider region and population to obtain more reliable conclusions. Although the new four-factor structure had high validity in China, our data also demonstrated high reliability for the original questionnaire and the three-factor structure. Considering that the original questionnaire and factor structure are widely used internationally, we suggest that future researchers adopt a three-factor structure for analysis when conducting transnational comparisons.

5 | CONCLUSION

After strict translation, back translation, and reliability and validity tests, this study verified the Standard Chinese Wound-QoL among patients with chronic wounds in China. Its reliability and validity indicators meet the psychometric requirements. Therefore, the Chinese Wound-QoL scale can be used as an assessment tool for the quality of life of patients with chronic wounds.

Future research could include a wider range of cases, especially with respect to the wound types included in this study for verification, to obtain more reliable conclusions.

AUTHOR CONTRIBUTIONS

Jin Liu, Huijuan Li, and Xin Qi designed the study. Jin Liu, Peiyong Zhang, Rui Bai, Xiaojin Fu, and Hui Guan were responsible for feasibility evaluation, as well as for recruiting patients and collecting data. Jin Liu performed data cleaning and analysis and wrote the manuscript. Bing Wen, Yanming Ding, and Xin Qi were responsible for the quality monitoring and provided comments on the revision of the manuscript. All the authors approved the final manuscript.

ACKNOWLEDGEMENT

We thank Prof. Matthias Augustin for giving us permission for the translation and Dr. Phil. Christine Blome for verifying the questionnaire, assisting in the translation and back translation procedures, and providing suggestions for revising the draft. We thank the medical staff of the Plastic Surgery & Burn Department of the Peking University First Hospital for their efforts and assistance with the research and the patients for their participation. This research was supported by the Youth Clinical Research Project of the Peking University First Hospital (grant number 2017CR13).

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

DATA AVAILABILITY STATEMENT

Data available on request from the authors.

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How to cite this article: Liu J, Li H, Zhang P, et al. Translation and validation of 17-item Wound-QoL questionnaire in a Chinese population. *Int Wound J*. 2023;20(3):659-668. doi:[10.1111/iwj.13907](https://doi.org/10.1111/iwj.13907)