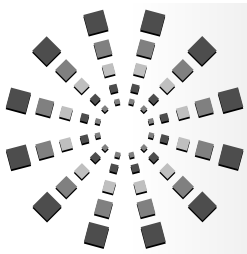

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Chinese Version of the Psychological Inflexibility in Pain Scale for Cancer Patients Reporting Chronic Pain

KEY WORDS
Cancer
Chinese version
Chronic pain
Psychological inflexibility
Psychometric properties

Background: Cancer-related chronic pain is reported by many patients during treatment. There are very few Chinese tools for measuring psychological inflexibility caused by cancer pain, particularly with regard to psychological processes that might influence pain severity and function disorder during cancer treatment. **Objective:** To culturally adapt the Psychological Inflexibility in Pain Scale (PIPS) to Chinese cancer patients experiencing chronic pain, including the determination of psychometric properties of the translated PIPS. **Methods:** This cross-sectional study included 2 phases: (1) translation and cultural adaptation and (2) determination of psychometric properties of the translated PIPS. In total, 389 cancer patients with several types of cancer experiencing chronic pain enrolled from May to September 2018 at a tertiary cancer hospital in Yuelu District of Hunan Province, China. **Results:** The Chinese PIPS version was semantically equivalent to the original. It had a 2-factor structure with satisfactory content validity (content validity index = 0.78–1.00), convergent and discriminant validity (composite reliability and average variance extracted at 0.41–0.89, $P < .001$), criterion-related validity ($r = 0.54$ and 0.41, $P < .001$), Cronbach's α coefficients ($\alpha = .87$), and test-retest reliability ($0.9 \leq r \leq 0.98$). **Conclusions:** The Chinese PIPS version has been culturally adapted and has strong psychometric properties. The scale is a psychometrically sound assessment of psychological inflexibility that can be used for future studies of pain and pain management for cancer patients. **Implications for Practice:** The study provides a vital tool for the psychological management of cancer patients with chronic pain.

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Supported by the Fundamental Research Funds for the Central Universities of Central South University (2018zzts957); Health and Family Planning Commission of Hunan Province, China (C20180261); and Hunan Provincial Science and Technology Department (2018JJ6110).

The authors have no conflicts of interest to disclose.

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Accepted for publication August 19, 2019.
DOI: 10.1097/NCC.0000000000000772

Pain is a common symptom for cancer patients, especially those with advanced, metastatic, or terminal cancer.[1] It occurs during cancer treatment and often persists afterward.[2] Chronic cancer–related pain is a public health issue.[3] Pain is reported by 40% of patients at the completion of curative treatment.[4] In contrast, it affects more than 66% of patients with advanced or terminal cancer, and 55% suffer moderate to severe pain.[5] Pain management during cancer treatment is a recently recognized problem,[6] and analgesic management is inadequate for 42% of patients.[7] The opioid misuse epidemic has proven to be a significant barrier to the management of cancer pain.[8] Unrelieved, persistent pain has physical effects[9] and threatens health-related quality of life,[10] including emotional distress.[11] Many literatures have described in cancer patients treatment-related emotional distress, which leads to increased pain intensity and prolonged pain duration and impacts the quality of life.[1,12–14]

The concept of psychological inflexibility is rooted in Acceptance and Commitment Therapy (ACT) which is a typical representative of the third wave of Cognitive Behavioral Therapy (CBT).[15] Acceptance and Commitment Therapy is a CBT alternative for pain management,[16] and it is thought to enhance psychological flexibility, which is the ability to persist with or change action in the context of the present moment, oriented by goals and dependent on the current situation.[17] There is a pathological ACT model focusing on psychological inflexibility, which is referred to inability to act effectively in accordance with a valued life in the presence of unpleasant thoughts, emotions, or bodily symptoms.[17]

Psychological flexibility is considered to be a cornerstone of personal health and social function[18] and serves as a protective factor for those experiencing emotional distress.[17] This attribute is a mediator between pain intensity and negative emotion. It also reduces disability and improves life satisfaction for pain patients who follow ACT.[19]

Previous studies of patients with cancer pain have reported that psychological flexibility is associated with reductions in pain intensity, pain-related anxiety, depression, and physical and psychological disability[20] and also with improvements in walking distance, need for medical visits,[21] pain acceptance, and quality of life.[22] Psychological inflexibility is not related to pain severity in all medical conditions. For example, psychological inflexibility was not associated with pain severity in neurofibromatosis type 1[23] but was related to pain in breast cancer patients.[24] Furthermore, psychological inflexibility is not specific to those with cancer pain but rather positively correlates with anxiety, depression, distress, and emotional interference in patients with noncancer pain.[25]

The Psychological Inflexibility in Pain Scale (PIPS) is the most direct scale for measuring psychological inflexibility among patients with chronic pain.[26,27] The PIPS has been shown to effectively measure psychometric properties in multiple languages[28–30] and various pain disorders including whiplash-associated disorder, fibromyalgia, large back pain, and heterogeneous chronic pain conditions. Notably, many cancer patients suffer from pain. Measuring psychological inflexibility would help improve pain management and quality of life in cancer-related pain. These studies demonstrated findings for patients with chronic pain except those with cancer-related pain.[28–30] Currently, there is no Chinese language version to measure pain-related psychological inflexibility in cancer patients. Such a Chinese version of the PIPS would help with the psychological management of Chinese cancer patients with chronic pain. This study was conducted to develop a culturally sensitive measure of psychological inflexibility that could be used for future studies of cancer pain and other pain-related conditions.

■ Methods

Design

This cross-sectional study was conducted at a tertiary cancer hospital in Yuelu District of Hunan Province, China. It included 2 phases: translation of the PIPS (phase 1, December 2017 to April 2018) and patient data collection (phase 2, May to September 2018).

Procedures

PHASE 1: TRANSLATION AND CULTURAL ADAPTATION

The Swedish version of the PIPS was obtained from the original author by e-mail[27]; in December 2017, it was culturally adapted based on established guidelines.[31,32] The following 5 steps were taken: (1) forward translation, (2) synthesis translation, (3) back-translation, (4) expert committee assessment, and (5) pretesting. A flow diagram outlining of the cultural adaptation process is shown in Figure 1.

First, forward translation of the original version of the PIPS into Chinese was completed by 2 English majors and independent professional bilingual translators with doctoral degrees, one with medical education background and one without. The translators were informed of the study objectives and received the original version of the PIPS via e-mail. Each translator completed a Translated Language Report (TL1 and TL2).

Next, a psychotherapist fluent in both Chinese and English compared the original PIPS with TL1 and TL2 and discussed any ambiguities and discrepancies with the first 2 translators using a committee approach. The psychotherapist was involved in the psychological research of cancer patient for 8 years and was a CBT expert. The 3 individuals worked together and produced a single preliminary translated language version consensus.

Third, the preliminary translated language version was back-translated independently by another 2 independent certified translators majoring in English, one with a medical education background and one without. These translators generated 2 back-translated language versions (B-TL1 and B-TL2). Neither of the 2 translators was informed of the study objectives.

Fourth, an expert committee evaluated the similarities and differences in wording, sentence structure, meaning, and relevance among the original, B-TL1, and B-TL2 versions. The expert committee consisted of 3 healthcare providers, 2 psychotherapists, 2 forward translators, and 2 back-translators. All 3 healthcare providers were engaged in cancer pain management for more than 8 years. Both psychotherapists had conducted ACT research for 5 years. A consensus was reached leading to the final translated language version.

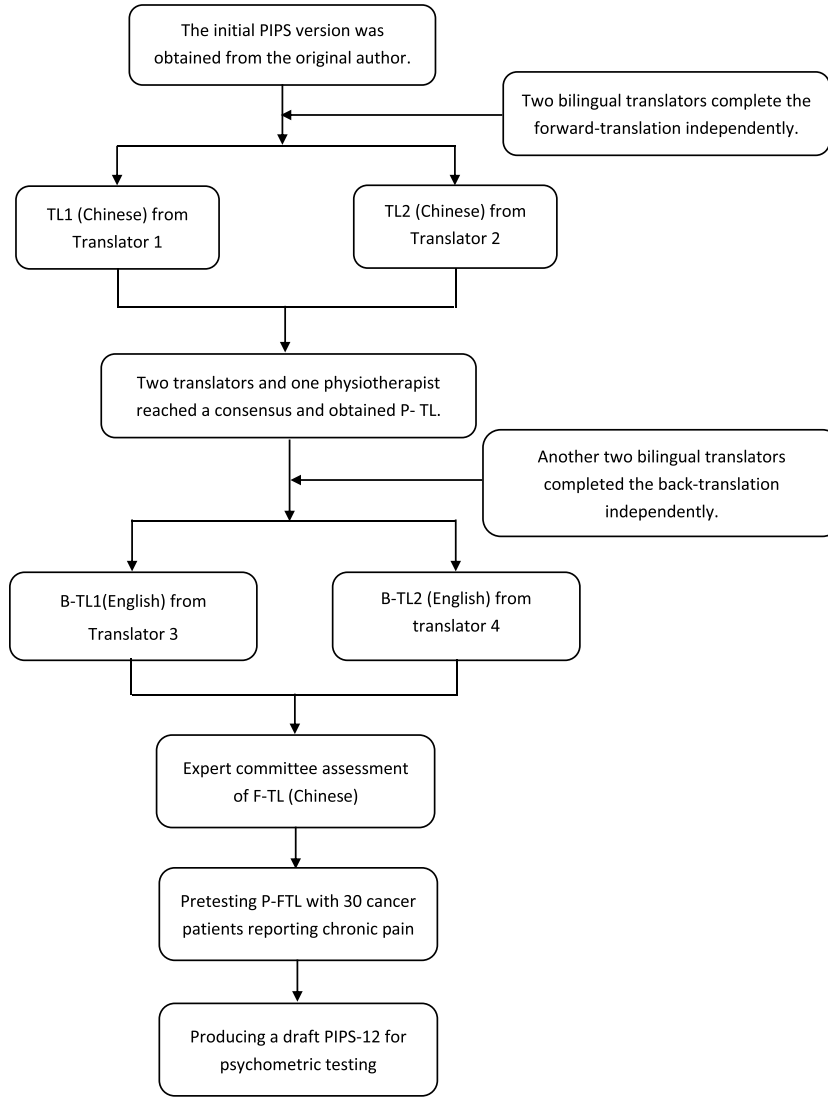

Figure 1 ■ Flow diagram outlining the process of cultural adaptation.

Finally, in the pretest stage, 30 cancer patients suffering from pain were recruited to perform a preliminary test to determine the PIPS final translated language version's readability and feasibility.[31] The patients evaluated the specific contents and discussed it with the staff, who produced a draft of the Chinese version of the PIPS ready for psychometric testing.

PHASE 2: CLINICAL STUDY

This cross-sectional study was conducted from May 2018 to September 2018 at a tertiary cancer hospital in Yuelu District of Hunan Province, China.

Participants

A total of 389 cancer patients reporting chronic pain enrolled in the study. Since we planned to use the PIPS to assess multiple cancer types in the next study, patients with different types of cancer who reported pain were recruited. Thirty patients were involved in the pretest stage. The remaining 359 patients completed all analyses described in this study: 120 of 359 patients (33.4%) completed the second assessment that determined the test-retest reliability, which further determined the consistency of the PIPS over 14 days. Confirmatory factor analysis (CFA) required a projected sample size of 300 to 500.[32] Our sample size was adequate. The participants' inclusion criteria were (1) age 18 years or older; (2) diagnosed with cancer based on histopathologic examination and pain duration for more than 3 months; (3) numeric rating scale (NRS) score of pain intensity of 4 or greater; (4) absence of neurological, psychiatric, or cognitive disorders; (5) an ability to communicate in Chinese; and (6) signed informed consent. Participants were excluded if they underwent certain psychotherapy 3 months before the study or were in the middle of certain psychotherapy.

Instruments

SOCIODEMOGRAPHIC AND CLINICAL DATA QUESTIONNAIRE

This measure covered 2 sections: sociodemographic characteristics (age, gender, education, marriage, job, residence, and religious faith) and clinical information (type of cancer, pain duration, pain site(s), and breakthrough pain or not).

NRS ON PAIN INTENSITY

The 11-point NRS measures pain intensity with a visual analog scale, ranging from no pain (0) to the worst pain imaginable (10), which provides a self-reported measurement of pain intensity in many settings and institutions.[33]

PSYCHOLOGICAL INFLEXIBILITY IN PAIN SCALE

This tool was developed to detect psychological inflexibility in patients with chronic pain.[26] The 12 items of the PIPS (PIPS-12) including avoidance (8 items) and cognitive fusion (4 items) subscales were published in English in 2010.[27] Participants record their response to each item using a 7-point scale from "never true" to "always true" (1-7). The total PIPS score is the sum of all subscales (avoidance and cognitive fusion), ranging from 12 to 84. A higher score indicates a higher level of psychological inflexibility. The PIPS-12 shows satisfactory reliability and validity: Cronbach's α coefficient at .87, comparative fit index (CFI) at 0.907, goodness-of-fit index (GFI) at 0.915, and adapted goodness-of-fit index (AGFI) at 0.875.[27]

SECOND EDITION OF ACCEPTANCE AND ACTION QUESTIONNAIRE

This instrument measures experiential avoidance.[34] This entity has been conceptualized as the tendency to avoid negative internal experiences and an important concept in numerous psychopathology conceptualizations as well as theories of psychotherapy. It refers to the self-related tendency to engage in certain behaviors leading to avoidance of pain and related distress.[26] In general, the measure has satisfactory psychometric properties among healthy university students in China. This scale consists of 7 responses based on a 7-point Likert scale, with scores ranging from 7 to 49 points. A higher score indicates greater experiential avoidance. The Chinese version of the second edition of the Acceptance and Action Questionnaire (AAQ-II) used in the current study showed sound reliability and validity, with Cronbach's α coefficient at .88, CFI at 0.99, Tucker-Lewis index at 0.97, root mean square error of approximation (RMSEA) at 0.06, and standardized root mean square residual (RMSR) at 0.02.[35]

CHRONIC PAIN ACCEPTANCE QUESTIONNAIRE

Chronic Pain Acceptance Questionnaire (CPAQ) is an instrument to assess the acceptance of chronic pain.[36] Chronic Pain Acceptance Questionnaire and AAQ-II were used in this study to measure the criterion-related validity. The 8 items of CPAQ (CPAQ-8) were translated into Chinese in 2016, containing 2 subscales: activity engagement and pain willingness. The 4-item pain willingness subscale is scored in reverse. All items are rated on a 7-point Likert scale ranging from 0 (never true) to 6 (always true). The total score is obtained by combining both subscales. Higher scores suggest better acceptance. The Chinese version of the CPAQ-8 demonstrates reliability with a Cronbach's α coefficient at .84 and good validity with CFI at 0.982, GFI at 0.967, and RMSEA at 0.061.[37]

Ethical Issues

The research was approved by the institutional review board of behavioral and nursing research at the Xingya Nursing School of Central South University (no. 2018016). Before the enrollment, participants were informed of the study objectives, confidentiality issues, anonymity in data collection management, and their free right to withdraw anytime from the participation. All participants willingly signed the informed consent.

Statistical Analysis

SPSS 23.0 (IBM Corp, Armonk, New York) was used for the descriptive analyses and item discrimination analyses and to assess the content validity, internal consistency, and test-retest reliability. AMOS 23.0 (IBM AMOS, Meadville, Pennsylvania) was used to further examine the factorial structure, including CFA and convergent and discriminant validity. For all analyses, frequencies and percentages were calculated for nominal variables, with means and SDs as well as 95% confidence intervals for continuous variables. $P \leq .05$ was considered statistically significant.

PARTICIPANT CHARACTERISTICS

For the sociodemographic information and clinical data of the participants, the status and distribution of the continuous variables were assessed with mean and SD, whereas the categorical variables were assessed with frequency distribution and percentage.

DETERMINATION OF THE STRUCTURE OF THE CHINESE VERSION OF THE PIPS

Item discrimination was analyzed before factor structure analysis, so that unsatisfactory items were initially eliminated ($P > .05$). To differentiate between respondents, we ranked the total scale. The lowest and highest 27% of the scores were classified as the low- and high-score groups, respectively. These 2 groups of extreme data were analyzed by independent t tests. Entries with $P > .05$ were deleted.

With regard to content validity, the item-level content validity index (I-CVI) and scale-level content validity index (S-CVI) were calculated to evaluate the item relevance and comprehensiveness. The S-CVI was consistent with the S-CVI/UA (universal agreement) and the S-CVI/Ave (average I-CVI). The I-CVI, S-CVI/UA, and S-CVI/Ave were all bigger than 0.78, 0.80, and 0.90, respectively, indicating good content validity.[38,39]

The factor structure of the scale was calculated with CFA, which was used to examine the underlying structure of the items. The χ^2/df, CFI, normalized fit index (NFI), GFI, AGFI, RMSR, and RMSEA were used to quantify the goodness of fit for the factorial model. A good-fit model was expected as follows: χ^2/df, <3.0; CFI, >0.90; NFI, >0.90; GFI, >0.90; AGFI, >0.90; RMSR, <0.05; and RMSEA, <0.08.[40]

To estimate the convergent and discriminant validity, composite reliability (CR) and average variance extracted (AVE) were performed by CFA with standardized and unstandardized regression weights. Raines-Eudy[41] recommended that CR of 0.50 or greater was acceptable. Henseler et al[42] suggested that each construct's

AVE should be more than its squared correlation with other constructs in the model.

To assess the criterion-related validity with Pearson correlation coefficient, we included 2 psychological inflexibility-related questionnaires (AAQ-II and CPAQ-8). A commonly accepted rule for describing Pearson correlation coefficients (r) is as follows: $r \geq 0.60$, strong; $0.30 < r < 0.60$, moderate; and $r \leq 0.30$, weak.[43]

Cronbach's α coefficient was used to assess the internal consistency of each facet of the scale. A value of 0.60 or greater was considered to be an acceptable level of internal reliability.[44] Of the 359 patients, 120 completed the second assessment to determine the test-retest reliability after 14 days, and the data were used to determine the scale consistency over time. A value greater than 0.70 indicated good test-retest reliability.[45]

■ Results

Phase 1

After the translation, expert committee assessment, and adaptation, 30 cancer patients with chronic pain engaged in the pretest. Several minor modifications were made for cultural equivalence. For item 2, we translated "don't have any energy" into "mei you li qi (没有力气)" rather than "jin pi li jin (筋疲力尽, exhausted)," a Chinese idiom, which might be difficult for those with lower education level to understand. For item 2, we added "when I am in pain" at the end of the sentence. For item 3, "I need to understand what is wrong in order to move on" was replaced by "I need to understand what's wrong with my pain sites in order to move on." For item 5, "I avoid doing things when there is a risk it will hurt or make things worse" was changed to "I avoid doing things when there is a risk it will cause me pain or make it worse" because the original version did not include pain information. For item 10, "control life" was translated into "zhi pei sheng huo (支配生活)" rather than "kong zhi sheng huo (控制生活)." For item 11, "planning activities" was translated into "zhi ding huo dong ji hua (制定活动计划)" rather than "gui hua huo dong (规划活动)" because the former was a more readable to Chinese expression. Most pretest subjects had no difficulty or confusion while completing the questionnaires. The Chinese PIPS was then considered ready for further evaluation.

Phase 2

PATIENT INFORMATION

The response rate was 97.8% (351/359). Data were missing for 2 variables (marriage and job), but they were kept in the analysis. Hence, data from all patients were used for analysis. Frequency distributions showed that no item was extremely skewed with low variability. Table 1 presents the sociodemographic information and clinical data. The mean patient age was 52.54 years with an SD of 13.29 years. Most participants were female (53.8%), were married (78.0%), lived in rural areas (59.3%), and did not have any religion (98.9%). With regard to clinical background, 39.8% had pain in the abdomen, and 24.2% were diagnosed with lung cancer. More than 75.5% reported pain for less than 6 months.

Table 1 • Demographic Information and Pain-Related Characteristics of the Participants (n = 359)

Variable	Frequency n	Frequency (%)	Mean ± SD	Range
Age, y	359		52.54 ± 13.29	18–82
Gender				
Female	193	53.8		
Male	166	46.2		
Education				
Primary	106	29.5		
Middle	95	26.5		
High	102	28.4		
Higher education	56	15.6		
Marital status				
Married	280	78.0		
Unmarried	18	5.0		
Divorced or widowed (others)	61	17.0		
Job				
Employee	74	20.6		
Self-employed	55	15.3		
Retired	35	9.7		
Others	195	54.3		
Residence area				
Rural	213	59.3		
Urban	146	40.7		
Pain location				
Abdomen	143	39.8		
Chest	125	34.8		
Shoulder and back	101	28.1		
Leg	59	16.4		
Arm	40	11.1		
Neck	36	10.0		
Lamb	34	9.5		
Head	18	5.0		
Others	31	8.6		
Diagnosis				
Lung cancer	87	24.2		
Liver cancer	54	15.0		
Breast cancer	43	12.0		
Colon cancer	33	9.2		
Pancreatic cancer	23	6.4		
Nasopharynx cancer	22	6.1		
Cervical cancer	16	4.5		
Others	81	22.6		
NRS	359		8.32 (1.58)	4-10

Abbreviation: NRS, numeric rating scale.

PSYCHOMETRIC TESTING OF THE CHINESE PIPS

Significant difference was seen in each item between the high- and low-score groups ($P < .001$), indicating well-differentiated scale items (Table 2).

Nine experts were engaged in the PIPS committee assessment. The I-CVIs were between 0.78 and 1.00; the S-CVI/UA and S-CVI/Ave were 0.92 and 0.97, respectively. These values indicated satisfactory relevance and comprehensiveness for all PIPS items.

Table 2 • Results of Item Discrimination Analyses (n = 359)

Item number	Low-Score Group, M ± SD	High-Score Group, M ± SD	*t*	*P*	95% CI of Difference Value: Lower Limit	95% CI of Difference Value: Upper Limit
1. I cancel planned activities when I am in pain.	4.48 ± 1.15	6.01 ± 0.57	−12.36	.000[a]	−1.78	−1.29
2. I say things like "I don't have any energy," "I am not well enough," "I don't have time," "I don't dare," "I have too much pain," "I feel too bad," or "I don't feel like it."	4.26 ± 1.00	5.72 ± 0.65	−12.74	.000[a]	−1.69	−1.23
3. I need to understand what is wrong in order to move on.	3.58 ± 1.15	5.11 ± 0.80	−11.41	.000[a]	−1.80	−1.27
4. Because of my pain, I no longer plan for the future.	4.73 ± 0.76	6.11 ± 0.511	−15.71	.000[a]	−1.55	−1.21
5. I avoid doing things when there is a risk it will hurt or make things worse.	5.05 ± 1.00	6.31 ± 0.48	−11.68	.000[a]	−1.48	−1.05
6. It is important to understand what causes my pain.	4.11 ± 0.94	5.22 ± 0.64	−10.23	.000[a]	−1.33	−0.90
7. I don't do things that are important to me to avoid pain.	4.25 ± 1.18	6.21 ± 0.76	−14.52	.000[a]	−2.23	−1.69
8. I postpone things because of my pain.	4.44 ± 1.14	6.11 ± 0.76	−12.70	.000[a]	−1.94	−1.42
9. I would do almost anything to get rid of my pain.	4.88 ± 1.00	5.98 ± 1.00	−8.19	.000[a]	−1.37	−0.84
10. It's not me that controls my life; it's my pain.	4.64 ± 0.99	6.08 ± 0.58	−13.01	.000[a]	−1.66	−1.22
11. I avoid planning activities because of my pain.	4.35 ± 0.88	5.94 ± 0.84	−13.82	.000[a]	−1.82	−1.37
12. It is important that I learn to control my pain.	4.75 ± 1.04	6.15 ± 0.60	−12.12	.000[a]	−1.63	−1.17

Abbreviations: 95% CI, 95% confidence interval; M, mean.
[a]$P < .001$.

Confirmatory factor analysis was completed with the maximum likelihood method based on a 2-factor structure. The 7 criteria (χ^2/df, CFI, NFI, GFI, AGFI, RMSR, and RMSEA) were calculated and are shown in Table 3. These analyses suggested that the 2-factor model was a good fit for the data explaining the largest variance. The model structure with standardized parameter estimates is depicted in Figure 2.

For the 2-factor structure of the PIPS (avoidance and cognitive fusion), the CR and AVE of avoidance were 0.89 and 0.50, and those for the cognitive fusion were 0.74 and 0.41, respectively, with satisfactory validity (Table 4). The squared correlations between avoidance and cognitive fusion (0.34, $P < .001$) were below the avoidance AVE (0.50) and cognitive fusion AVE (0.41).

For criterion-related validity, the correlation between PIPS and AAQ-II was 0.54 ($P < .001$), whereas that between PIPS and CPAQ-8 was −0.41 ($P < .001$).

Cronbach's α coefficient was .87 for the Chinese PIPS version, indicating good internal consistency. The Cronbach's α coefficients for avoidance and cognitive fusion subscales were .88 and .74, respectively.

The responses to the Chinese PIPS provided by a random subsample of 120 patients with cancer pain indicated high temporal stability of the scale over a 14-day period. The intraclass correlation coefficients were $r = 0.98$ (overall PIPS), $r = 0.98$ (avoidance), and $r = 0.97$ (cognitive fusion).

■ Discussion

This study produced a Chinese version of the PIPS for patients experiencing chronic pain during cancer treatment. This version is culturally adapted and has sound measurement properties (Appendix).

Table 3 • Goodness-of-Fit Values for Different Models (n = 359)

Model	Model Fit Indices: χ^2	*df*	χ^2/df	CFI	NFI	GFI	AGFI	RMSR	RMSEA
12-Item PIPS[a]	132.91	53	2.508	0.953	0.925	0.944	0.917	0.040	0.065
12-Item PIPS[b]	264.06	53	4.98	0.98	Null	Null	Null	0.058	0.070
14-Item PIPS[c]	533.41	77	6.93	0.872	Null	0.888	0.847	Null	0.099
12-Item PIPS[d]	324.60	53	6.12	0.907	Null	0.915	0.875	Null	0.092
11-Item PIPS[e]	81.07	53	1.53	Null	Null	0.925	Null	Null	0.054

Abbreviations: AGFI, adapted goodness-of-fit index; CFI, comparative fit index; GFI, goodness-of-fit index; NFI, normalized fit index; PIPS, Psychological Inflexibility in Pain Scale; RMSR, root mean square residual; RMSEA, root mean square error of approximation.
[a]The 12-item PIPS was a result of goodness-of-fit values in the current study.
[b]The 12-item PIPS was a result of goodness-of-fit values in the study of Trompetter et al.[29]
[c]The 14-item PIPS was a result of goodness-of-fit values in the study of Wicksell et al.[27]
[d]The 12-item PIPS was a result of goodness-of-fit values in the study of Wicksell et al.[27]
[e]The 11-item PIPS was a result of goodness-of-fit values in the study of Barke et al.[28]

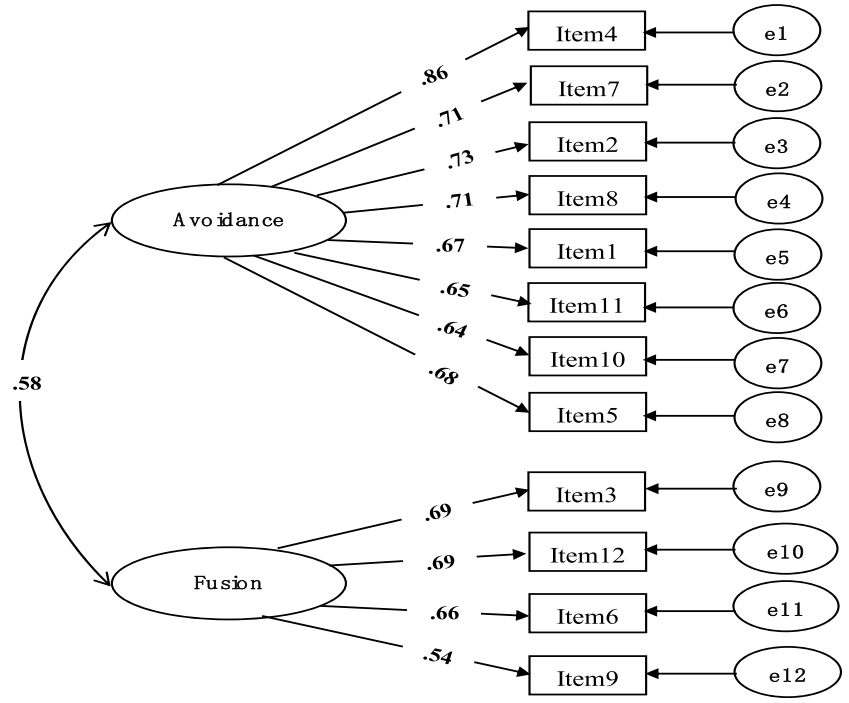

Figure 2 ■ Two-factor model structure with standardized parameter estimates.

Cultural Adaptation

The equivalence in translation and culture adaptation was rigorously maintained. The wording and syntax were at a primary level to meet different education levels. For example, idioms are avoided, which is consistent with the study by Shen et al.[46]

■ Psychometric Evaluation

This study tested the psychometric properties of the Chinese PIPS version in cancer patients reporting chronic pain. The findings were comparable to those of the former studies,[26–30] revealing significant item discrimination among all items in the Chinese PIPS version.

Item discrimination analysis was therefore conducted before factor analysis to fully qualify the Chinese version. As expected, the item scores significantly distinguished the level of psychological inflexibility in cancer patients suffering chronic pain for every item, even though this step was omitted in previous adaptations of the PIPS.[26–30] This omission was likely due to different statistical indicators used in those studies, with no essential impact on the scale quality.

Content validity was assessed to guarantee semantic equivalence to the original PIPS. The adapted Chinese PIPS version showed excellent content validity and can now be used for Chinese cancer patients reporting chronic pain. Such adjustments have not been reported in previous adaptations of the PIPS concerning content validation,[26–30] which may be that adjustments are not necessary because of minimal language differences, higher

Table 4 • Confirmatory Factor Analysis With Standardized and Unstandardized Regression Weights (n = 359)

Item No.	Subscale	UNSTD	SE	*Z*	*P*	STD	CR	AVE
Item 4	Avoidance	1				0.862	0.89	0.50
Item 7	Avoidance	1.227	0.081	15.072	.000[a]	0.706		
Item 2	Avoidance	1.019	0.065	15.743	.000[a]	0.728		
Item 8	Avoidance	1.125	0.075	15.08	.000[a]	0.706		
Item 1	Avoidance	1.002	0.071	14.018	.000[a]	0.669		
Item 11	Avoidance	0.995	0.074	13.489	.000[a]	0.65		
Item 10	Avoidance	0.949	0.071	13.279	.000[a]	0.643		
Item 5	Avoidance	0.834	0.058	14.456	.000[a]	0.685		
Item 3	Fusion	1				0.693	0.74	0.42
Item 12	Fusion	0.897	0.089	10.074	.000[a]	0.693		
Item 6	Fusion	0.708	0.073	9.734	.000[a]	0.655		
Item 9	Fusion	0.69	0.083	8.329	.000[a]	0.536		

Abbreviations: AVE, average variance extracted; CR, composite reliability; SE, standard error; STD, standardized; UNSTD, unstandardized.
[a]$P < .001$.

levels of education, or ready understanding of the content in those countries.

For construct validity, the CFA results were slightly different from those of the other 4 PIPS versions. Herein, this 2-factor model had a good fit with the Swedish,[26,27] Dutch,[29] and Spanish[30] versions. With regard to the CFA, the current study showed that the 2-factor model was a good fit, consistent with the Swedish,[26,27] Dutch,[29] and German[28] versions, except for item 3 ("I need to understand what is wrong in order to move on"), which was removed in the German version. Other versions kept the 12 items of the original PIPS.

Convergent and discriminant validity assessments were not conducted for the other 3 PIPS translations.[28–30] However, those versions underwent hierarchical regression analyses to assess the relationship between psychological inflexibility and background variables (age, gender, education, and pain duration) and/or dependent variables (mindfulness, pain intensity, pain disability, life satisfaction, anxiety, depression, pain acceptance, life control, quality of life, affective distress, and pain catastrophizing).[27–30]

Criterion-related validity was computed in this study as well as in the Spanish[30] and Swedish[26,27] versions. There was a strong relationship between psychological inflexibility and pain acceptance.

The Cronbach's α coefficient for the Chinese version of the PIPS was satisfactory, which was consistent with the Swedish,[26,27] Dutch,[29] Spanish,[30] and German[28] versions. The test-retest reliability was assessed by intraclass correlation coefficient and was acceptable after a 14-day interval, suggesting temporal stability, which is consistent with the Spanish version.[30]

■ Limitations

This study has some limitations. First, the participants are primarily all cancer patients reporting chronic pain; therefore, findings in this study may not be generalizable to all cancer patients with pain. In addition, patient recruitment is based on the detection of psychological inflexibility in a heterogeneous group of patients with chronic pain due to different types of cancer. Further research is needed to determine the specific measurement of psychological inflexibility among patients with specific types of cancer reporting chronic pain.

■ Implications for Nursing Practice and Research

With the high incidence of chronic cancer pain, pain management mainly relies on analgesics. Healthcare providers are also required to help patients accept the pain and improve their quality of life from a cognitive perspective. The Chinese PIPS version can be used to measure the psychological inflexibility in cancer patients with chronic pain. For those with a high degree of psychological inflexibility, healthcare providers may suggest nonpharmacological interventions to reduce negative emotions. This may reduce symptom severity and serve as a viable pain management approach. Further multicenter research is necessary to determine a meaningful clinical cutoff score for this Chinese version of the PIPS. Likewise, the value of this scale as a means to recognize and modify psychological inflexibility in the context of cancer pain management requires further clarification.

■ Conclusions

This study has developed a culturally adapted Chinese version of the PIPS with satisfactory psychometric properties. It is useful in evaluating psychological inflexibility in cancer patients with chronic pain. The Chinese version of the PIPS is established as a result of multidisciplinary teamwork and provides a vital assessment tool to facilitate the psychological management of cancer patients with chronic pain.

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Appendix

疼痛患者心理灵活性量表

Psychological Inflexibility in Pain Scale

请阅读下表，根据你当前的实际情况作出判断并在相应的数字上打“√”。

Below you will find a list of statements. Please rate how true each statement is for you right now by circling a number next to it.

题　　目	完全不符合	几乎不符合	很少符合	偶尔符合	经常符合	几乎符合	完全符合
1、疼痛时，我会取消计划好的活动 I cancel planned activities when I am in pain.	1	2	3	4	5	6	7
2、疼痛时，我会说“我没力气”、“我不太舒服”、“我没时间”、“我不敢”、“我太痛了”、“我感觉很糟糕”或“我不想这样”这一类的话。 I say things like ”I don’t have any energy”, ”I am not well enough”, ”I don’t have time”, ”I don’t dare”, ”I have too much pain”, ”I feel too bad”, or ”I don’t feel like it”.	1	2	3	4	5	6	7
3、我需要弄清楚疼痛的原因，才能继续好好生活 I need to understand what is wrong in order to move on.	1	2	3	4	5	6	7
4、由于身体疼痛，我不再规划未来 Because of my pain, I no longer plan for the future.	1	2	3	4	5	6	7
5、我不会冒险去做可能导致我疼痛或者让疼痛加重的事。 I avoid doing things when there is a risk it will hurt or make things worse.	1	2	3	4	5	6	7
6、了解引起我疼痛的原因很重要。 It is important to understand what causes my pain.	1	2	3	4	5	6	7
7、为了避免疼痛，即使对我很重要的事我也不会去做。 I don’t do things that are important to me to avoid pain	1	2	3	4	5	6	7
8、由于疼痛，有些事情我会推迟去做。 I postpone things because of my pain.	1	2	3	4	5	6	7
9、我愿意尝试几乎所有能缓解我疼痛的事情。 I would do almost anything to get rid of my pain.	1	2	3	4	5	6	7
10、支配我生活的，不是我自己，而是我的疼痛。 It’s not me that controls my life, it’s my pain.	1	2	3	4	5	6	7
11、由于疼痛，我不去制定活动计划。 I avoid planning activities because of my pain.	1	2	3	4	5	6	7
12、学会控制疼痛对我很重要。 It is important that I learn to control my pain.	1	2	3	4	5	6	7