Translation and psychometric validation of the Patient Participation Culture Tool for healthcare workers in Chinese nursing context

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Abstract

Background Promoting patient participation stands as a global priority in nursing care. Currently, there is a lack of a standardized tool to assess the culture of patient participation from the perspective of nurses in China.

Aims To translate and examine the validity and reliability of the Patient Participation Culture Tool for healthcare workers (PaCT-HCW) on general hospital wards in Chinese nursing context.

Methods A cross-sectional research study was conducted among 812 nurses. Brislin's recommendations were adhered to during the translation of the scale. Validity was assessed using construct validity, content validity, and face validity. Split-half reliability, test–retest reliability, and internal consistency reliability were used to evaluate dependability. The study was guided and reported following the STROBE checklist and recommendations for reporting the results of studies of instrument and scale development and testing.

Results The Chinese version of PaCT-HCW (the PaCT-HCW-C) exhibits good face validity and content validity. A rigorous exploratory factor analyse verified a six-factor (competence, support, perceived lack of time, information sharing and dialogue, response to questions and acceptance of a new role) scale structure with a cumulative variance contribution of the factors with 44 items of 68.840%. With a Cronbach's α coefficient of 0.962, split-half reliability of 0.866, and intraclass correlation coefficients of 0.989, the instrument demonstrates great reliability. Confirmatory factor analysis results validated the consistency of the six factors with the structure of the PaCT-HCW-C scale.

Conclusions The 44-item PaCT-HCW-C is a valid and reliable instrument with satisfactory psychometric properties. It could serve as a tool for assessing the effectiveness of international programs aimed at fostering patient participation from the perspective of nurses, while also providing insights from China's practical experiences.

Keywords Patient-centred care, Patient participation, Nurses, Psychometric, Validity, Reliability

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Background

Studies have demonstrated that roughly 1 in every 10 patients encounters harm in healthcare, resulting in over 3 million deaths annually due to unsafe care [1]. However, above 50% of harm (1 in every 20 patients) is preventable [2]. The impact of meaningful patient and family participation is remarkable for improving patient safety in healthcare [3]. Patient safety is defined as "the absence of preventable harm to a patient and the reduction of the risk of unnecessary harm associated with healthcare to an acceptable minimum." Up to this point, studies have consistently shown positive outcomes for patients who actively engage in their treatment [3, 4]. The importance of patient participation, a pillar of person-centered care, in modern healthcare, cannot be overstated [5, 6]. Many studies have shown the beneficial effects of patient participation in safety-related activities on healthcare quality, reducing medication errors and hospital stays, promoting self-management in chronic illnesses, medication adherence and patient safety [6–9]. Additionally, patients may have a feeling of empowerment and participation in the delivery of their treatment. In light of this, the World Health Organization and current studies consider encouraging patient participation a global priority [4, 10].

Although patient participation is commonly used in healthcare, there is no universal agreement on what is meant by the phrase "patient participation". A concept analysis conducted in recent years showed that patient participation revolves around a patient's rights and opportunities to influence and engage in the decision making about his care through a dialogue attuned to his preferences, potential and a combination of his experiential and the professional's expert knowledge [11]. In nursing care, patients' participation is defined as a concept that relates to and includes the three caring science concepts: learning, caring relationship and reciprocity [12].

Patient participation is influenced by three things: Effective communication, factors affecting patients, and factors affecting healthcare professionals [13]. Patients' choices to engage in patient safety programs are influenced by their knowledge, health circumstances, attitudes, and experiences [14]. However, the factors of patient participation connected to healthcare workers have received little research attention [15]. Healthcare professionals and patients respond to one another's conduct in a reciprocal process called patient involvement. Patient participation is mostly sparked by the healthcare professionals (particularly nurses) readiness to delegate authority and responsibility. And before patient participation can be created, this conduct is a necessary step [15]. More understanding of how these variables affect nurses' behavior is thus required. Additionally, research

has shown that not all nurses support patient participation and that nurse conduct may both promote and impede active patient participation [16, 17]. Some nurses were not fostering an atmosphere that encouraged active patient participation, thus, they needed to develop techniques to do so [4]. To progress the research, it is necessary to evaluate the nurses-related patient participation variables that best reflect culture of patient participation in public and academic hospital wards using accurate and trustworthy measuring methodologies.

Nurses, as the linchpin of healthcare, play an indispensable role in advocating for patient participation in disease management. Patient participation also contributes, to a certain extent, to enhancing nurses' job satisfaction, commitment, and supportive behaviors [6]. Therefore, measuring the culture of patient participation from the perspective of nurses holds significant clinical significance. For patient participation results to be valid, effective, and trustworthy, measurement is crucial. Even though high-quality healthcare is highly connected with patient participation, there are few reliable ways to assess and provide a thorough understanding of patient participation [18]. To evaluate patient participation from the viewpoints of patients, family caregivers, observers, or other stakeholders, previous research has produced several questionnaires [19]. The Patient Preferences for Patient Participation (4Ps) is a clinical tool designed to incorporate the preferences and experiences of patients. It empowers patients to depict, prioritize, and evaluate their involvement in healthcare, thereby fostering improved communication and collaboration within the healthcare setting [20]. The dyadicOPTION was created by one study team to assess patient perspectives on collaborative decision-making, the observer, and the general practitioner [21]. Although the dyadic OPTION has the greatest potential for evaluating the fundamental elements of patient involvement, it is not the best way to comprehend the ward's patient participation culture from the viewpoint of the nurses.

The behavior of the nurses is ingrained in the collective culture of the ward, which is crucial in change management. Eight sections make up the Patient Participation Culture Tool for Healthcare Workers (PaCT-HCW), created based on this culture by researchers in Belgium. Its reliability and validity have been shown to be high [6]. In 2017, the PaCT-HCW was revised into the Patient Participation Culture Tool for Inpatient Psychiatric Wards (PaCT-PSY), demonstrating strong psychometric properties and content validity, thus further promoting its utilization [15]. However, a crucial issue is whether it can be applied to nurses in China, a country with a communal culture like Belgium. To provide healthcare managers with a new instrument to evaluate patient participation

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culture from the nurses' viewpoint in Chinese hospital wards, this study aims to translate and perform a cross-cultural adaptation of the PaCT-HCW to the Chinese context, and examine its psychometric properties.

Methods

Participants and study design

The research report followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE), which provides recommendations for reporting observational studies [22] and recommendations for reporting the results of studies of instrument and scale development and testing [23, 24].

A cross-sectional, multicenter study was undertaken between May and August 2022 to explore the psychometric characteristics of the Chinese version of PaCT-HCW (the PaCT-HCW-C) in Henan Province, China. This study conveniently selected 1–2 hospitals from the eastern region (1 hospital), western region (1 hospital), southern region (1 hospital), northern Region (1 hospital), and central region (2 hospitals) regions of Henan Province to conduct a multicenter survey, ultimately including a total of 6 hospitals. In each hospital, nurses were recruited according to the proportion of the number of nurses in different departments as much as possible to increase the sample diversity. The directors of the nursing departments in each hospital aided the researchers in recruiting participants for the study. Subsequently, they conducted an online information session outlining the objectives of the research and ensuring the confidentiality of the data. Eligibility Criteria: Nurses meeting both (a) possessing a nurse practice credential from China and (b) fulfilling the inclusion criteria while having hospital-based clinical nursing experience were included. If a nurse wasn't helping with ward care, they were excluded because they had less direct interaction with patients.

According to the principle that the sample size required for factor analysis should be 5 to 10 times the number of items, and given that the Chinese version of the PaCT-HCW contains 52 items, this study calculated the sample size as 6 times the number of items. Factoring in a 15% rate of invalid questionnaires, the required sample size should be no less than 368 participants. Considering that both exploratory factor analysis and confirmatory factor analysis were to be conducted in this study, the minimum sample size required should be at least 736.

Instruments

General demographic questionnaire

The general demographic questionnaire was designed by the researchers based on existing studies [13, 15]. Ten different factors were examined: gender, age, education, job title, managerial or administrative position, type of ward (e.g., surgical, internal medicine, obstetrics and gynecology, medical rehabilitation, geriatric, other), length of employment in the hospital, length of employment on the ward, hospital grade, and city in which the hospital is situated.

The PaCT-HCW

The Patient Participation Culture Tool for Healthcare Workers (PaCT-HCW) is a self-assessment instrument designed to evaluate the level of patient participation culture within hospital wards. (Please refer to Supplementary file 1 for the English version). As of now, it is the only instrument available for measuring patient participation culture from the viewpoint of a healthcare professional [6, 19]. Eight unique subscales(competence, perceived lack of time, support, information sharing and dialogue, perceived lack of time, factual questions, challenging questions, notifying questions, and acceptance of a new role) make up the 52-item PaCT-HCW, according to the development and validation study in four phases. Each subscale's Cronbach's α ranged from 0.67 to 0.93, while Armor's alpha varied somewhat higher, from 0.76 to 0.94, showing strong psychometric qualities [6]. A four-point Likert scale is used for all questions (1: strongly disagree; 4: strongly agree).

Translation and cultural adaptation

First, the researchers requested Simon Malfait's consent via email to translate the PaCT-HCW into Chinese for this research. Following Brislin's translation criteria, it was subsequently translated into Chinese [24]. There were four phases involved in the translating process. (a) Forward translation: PaCT-HCW was translated from English to Simplified Chinese by two bilingual nursing researchers. The initial draft was produced following discussions within the study team to ensure consistency between the translated versions. Subsequently, the Chinese draft was translated back into English by two English professors experienced in international studies but unfamiliar with the tool. They reviewed and adjusted the discrepancies in the back-translated version. Finally, the research team members compared the original instrument with the translated and back-translated versions to identify any differences. (c) Cultural adaptation: An essential phase in the translation measurement process is cultural adaptation. To ensure that the ideas and implications of the original PaCT-HCW were preserved, this research enlisted the participation of seven specialists. The seven experts were nurse practitioners, nurse educators, or researchers with more than 10 years of professional experience and competence in patient participation or measurement. Regarding conceptual equivalence, content relevance, and clarity of presentation, the

experts separately assessed each scale item. Each item was assessed independently, and any unclear or complicated language was changed. Thereafter, 15 ward nurses were used to test the PaCT-HCW in Chinese until all misunderstandings had been resolved. The PaCT-HCW-C was created after these procedures.

Data collection

Participants were given the choice to complete the survey using an online platform (the Questionnaire Star platform) or using a paper copy. All the participants completed the PaCT-HCW-C and the general demographic questionnaire. The Questionnaire Star platform was set to delete questionnaires whose answering time was too short (according to pre-survey statistics, the shortest answering time for face-to-face paper answers was 2 min, and accordingly deleted questionnaires that are less than 120 s), and invalid questionnaires such as scribbling according to the rules. After the paper questionnaire is completed, the researchers took it back on the spot, checked the completeness of the questionnaire, and ask them to fill in the missing items in time. Finally, a total of 826 participants were eventually enrolled through the Questionnaire Star platform and offline questionnaire distribution and the number of valid questionnaires was 812. From the participants, 50 were randomly selected using a computer-generated table of random numbers. To test the stability of the PaCT-HCW-C, the 50 participants were contacted by telephone or WeChat and asked to fill in questionnaires again on the 14th day after the first questionnaire was filled.

Statistical data analysis

The data analysis procedure uses IBM SPSS Statistics 21.0 and AMOS 24.0. For categorical data, frequency and percentage were utilized, while continuous variables were described using the mean ± standard deviation (SD).

Content validity

The seven experts in the cultural adaptation phase were asked to take part in the cultural adaptation evaluation, using a 4-point Likert scale (1 being not relevant and 4 being very relevant). If there were six or more experts, acceptable content validity was determined as I-CVI ≥ 0.80 and S-CVI ≥ 0.90 [25].

Item analysis

By examining and evaluating each item of the PaCT-HCW-C, item analysis was utilized to filter and assess the quality of the items [26]. The correlation coefficient approach, each item's critical ratio (CR), Cronbach's α, and factor loading (factor analysis) were the evaluation techniques employed for the item analysis. The following

criteria must be met for an item to be eliminated: (a) a CR value < 3.00; (b) a corrected item-total correlation coefficient value < 0.40; and (c) When a record was removed, Cronbach's α increased significantly. Ultimately, after professional assessment and judgment by the researchers, items were considered for elimination if they met two or more of these criteria.

Factor analysis

Both confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) were selected to assess the construct validity of the PaCT-HCW-C, aiming to validate the factor structure of the tool within the Chinese context and ensure its applicability and reliability in this specific setting. A total of 812 samples were randomly divided into group A (406 individuals) for EFA and group B (406 participants) for CFA. To determine the PaCT-HCW-C factor structure, an EFA based on a PCA with a varimax rotation was performed. By determining the Kaiser–Meyer–Olkin coefficient (KMO > 0.6) and using Bartlett's sphericity test ($p < 0.05$), the applicability of factor analysis was confirmed. A factor load of more than 0.40 and an eigenvalue greater than 1.0 was extracted [27]. To confirm the fit of the factor structure, a CFA was conducted. The chi-square goodness-of-fit test, the goodness-of-fit index (GFI), the chi-square-to-degrees-of-freedom ratio (χ^2/df), the comparative fit index (CFI), the adjusted goodness-of-fit index (AGFI), the incremental fit index (IFI), the tacker-lewis index (TLI), the RMSEA (root mean square error of approximation), and the RMR were all used to calculate the (root mean square residual). The GFI values were > 0.80, suggesting an appropriate model, while the RMR values were < 0.05, and the RMSEA values were < 0.08, indicating an acceptable model. If the CFI, TLI, and IFI values are more than 0.90, it means that the modeled trajectory closely matches the data [28].

Reliability analysis

For the PaCT-HCW-C, Cronbach's α and split-half reliability were computed. The scale often has a Cronbach's α (> 0.60) and a Cronbach's α (> 0.80) for each subscale, suggesting strong internal consistency [29]. Using the Intraclass Correlation Coefficient (ICC) and a 95% confidence interval (CI), the test–retest reliability was assessed. It was determined whether reproducibility was "excellent" (ICC, > 0.75), "good" (ICC, 0.60–0.74), "fair" (ICC, 0.40–0.59), or "poor" (ICC, < 0.40) [30]. Fifty nurses were initially chosen and retested after two weeks to determine the test–retest reliability of the scale.

Ethical considerations

The Research Ethics Committee of Zhengzhou University gave its consent to this project (Blind for review) and

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access permissions were sought from the study sites. All prospective participants received information about the study, and they all voluntarily agreed to be recruited. All participants provided written informed permission for the study or electronically completed a consent form.

Results

Participant characteristics
There were 812 valid questionnaires in this study. Among the participants, 777 (95.7%) of whom were women and 35 (4.3%) of whom were males. And the majority were 25~35 years old (44.0%), supervisor nurse (56.9%), holding a bachelor's degree (83.6%), and working in internal medicine wards (43.9%). See Table 1 for more details.

Face validity and content validity
15 ward nurses from different types of wards (internal medicine, surgical, gynaecology and obstetrics, medical rehabilitation, and geriatric) were recruited to evaluate the face validity of the PaCT-HCW-C. These nurses had more than ten years of work experience and had direct encounters and communication with patients. Everyone who took the PaCT-HCW-C said that the questions were simple and straightforward. Participants said the scale could be finished in between 5 and 10 min and that the number of items was adequate. The PaCT-HCW-C was evaluated by the seven experts, and the results demonstrated excellent content validity, with an item-level content validity index (I-CVI) ranging from 0.71 to 1.00 and a scale-level content validity index (S-CVI) of 0.97.

Item analysis
The Item analysis results of the PaCT-HCW-C are shown in Table 2. A t-test using an independent sample was performed, using the highest 27% of the PaCT-HCW-C 's score as the high group and the lowest 27% as the low group. Each item's findings between the high and low groups were significantly different ($p < 0.01$), and all of the CR values > 3.00. The 52-item PaCT-HCW-C's correlations varied from 0.429 to 0.784 ($p < 0.01$) in terms of significance. Therefore, no items were deleted at this step.

Construct validity and model fit
The results of EFA
Bartlett's test of sphericity attained a level of significance after an EFA of the 52 items revealed the KMO value to be 0.945 ($x^2 = 18,682.653$, $p < 0.001$), proving that it was appropriate for the group's factor analysis Participants in A. Eight factors were extracted from the main component analysis using a varimax rotation, however they were not entirely compatible with the eight components of the original PaCT-HCW, accounting for 70.565% of the variance. As a result of the factor structure's flaws,

several goods had double or triple loadings. Once the EFA produced a structure that was easy to understand, these components with inappropriate loading were deleted. Therefore, the final EFA was conducted with the appropriate KMO (0.941) and Bartlett sphericity test ($x2 = 15,423.932$, $p < 0.001$). Additionally, the scree plot and eigenvalues revealed a six-factor solution with 44 items that accounted for 68.840% of the overall variance. KMO score of 0.945 and Bartlett's test of sphericity degree of significance ($x^2 = 18,682.653$, $p < 0.001$), an EFA of the 52 items revealed that it was appropriate for component analysis of the group A participants. Eight components that were not entirely consistent with the eight variables of the original PaCT-HCW were extracted by main component analysis with a varimax rotation and accounted for 70.565% of the variance. As a result of the factor structure's flaws, several goods had double or triple loadings. Once the EFA produced a structure that was easy to understand, these components with inappropriate loading were deleted. A suitable KMO (0.941) and Bartlett sphericity test ($x^2 = 15,423.932$, $p < 0.001$) were used to conduct the final EFA. Additionally, the scree plot and eigenvalues revealed a six-factor solution with 44 items accounting for 68.840% of total variation. In the final EFA results of the PaCT-HCW-C, factors 5, 6, and 7 in the original PaCT-HCW were merged into one factor and renamed as "Response to questions", and the other item attribution and naming of factors were consistent with the original PaCT-HCW. See details in Fig. 1 and Table 3.

The results of CFA
CFA was performed using the original eight-factor structure [6] in group B participants. Despite taking into account the modification indices, the findings demonstrated that the eight-factor model had insufficient goodness of fit and was only partially supported. Then, a six-factor model derived from the EFA was used to evaluate the data for CFA, and this model had improved fit quality compared to the eight-factor model (Fig. 2). In addition, using the modification indices, it was effective in modifying the model to get a satisfactory goodness of fit ($x^2 = 2252.536$, df = 862, x^2/df = 2.613, GFI = 0.803, RMR = 0.024, CFI = 0.916, TLI = 0.983, IFI = 0.908, RMSEA = 0.063). The model allowed the residuals of the various items to correlate, and it was thought that the correlations between the residuals might be explained by their commonalities [31]. For example, items P29 and P30 are about discharge-related information.

Reliability
The Cronbach's α of the PaCT-HCW-C was 0.962, and the Cronbach's α of the six subscales were ranged from 0.748 to 0.966, indicating satisfactory internal

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Table 1 Overview of the participants' characteristics (*n* = 812)

Variable	Options	n	%
Gender	Male	35	4.3
	Female	777	95.7
Age	< 25 years	72	8.9
	25 ~ 35 years	357	44.0
	35 ~ 45 years	319	39.2
	≥ 45 years	64	7.9
Education	College degree or below	107	13.2
	Bachelor degree	679	83.6
	Postgraduate education	26	3.2
Job title	Nurse	104	12.8
	Senior nurse	205	25.3
	Supervisor nurse	462	56.9
	Associate chief nurse-master	35	4.3
	Chief nurse-master	6	0.7
Hold an administrative or managerial position	Yes	135	16.6
	No	677	83.4
Ward type	Internal medicine	356	43.9
	Surgical	171	21.1
	Gynaecology and obstetrics	88	10.8
	Medical rehabilitation	27	3.3
	Geriatric	30	3.7
	Others	140	17.2
Duration of employment in the hospital	< 1 years	36	4.4
	1 ~ 3 years	79	9.7
	3 ~ 5 years	64	7.9
	5 ~ 10 years	172	21.2
	≥ 10 years	461	56.8
Duration of employment on the ward	< 1 years	73	8.9
	1 ~ 3 years	63	7.6
	3 ~ 5 years	78	9.6
	5 ~ 10 years	185	22.8
	≥ 10 years	413	50.1
Hospital grade	Primary hospital	27	3.3
	Secondary hospital	58	7.2
	Tertiary hospital	727	89.5
City where the hospital is located	Eastern Henan	112	13.8
	Western Henan	161	19.8
	Southern Henan	103	12.7
	Northern Henan	126	15.5
	Central Henan	310	38.2

consistency. The split-half reliability of the PaCT-HCW-C was 0.866, and the six subscales' split-half dependability values varied from 0.625 to 0.919 (Table 4). The 2-week test–retest reliability was assessed in 50 nurses. The ICC of the PaCT-HCW-C was 0.989 (95% CI: 0.980–0.994; *p* < 0.01), which may be considered adequate. The results are shown in Table 5.

The final scale

After the translation into Chinese, the PaCT-HCW-C consists of six dimensions (competence, support, perceived lack of time, information sharing and dialogue, response to questions and acceptance of a new role), totaling 44 items. The number of items is moderate, facilitating easy comprehension. The scale utilizes a

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Table 2 Analysis of the items of the PaCT-HCW-C ($n = 812$)

Items	Mean	SD	CR	Item-total correlations	Cronbach's α if the item was deleted
Item 1	3.71	0.562	-13.666	0.481**	0.968
Item 2	3.74	0.527	-13.838	0.498**	0.968
Item 3	3.37	0.677	-17.508	0.505**	0.968
Item 4	3.34	0.734	-18.593	0.589**	0.968
Item 5	3.42	0.692	-22.842	0.651**	0.968
Item 6	3.51	0.696	-19.505	0.638**	0.968
Item 7	3.54	0.647	-18.054	0.549**	0.968
Item 8	3.46	0.716	-19.722	0.600**	0.968
Item 9	3.54	0.711	-20.104	0.640**	0.968
Item 10	3.54	0.653	-21.701	0.659**	0.968
Item 11	3.44	0.762	-21.683	0.609**	0.968
Item 12	3.16	0.944	-13.513	0.436**	0.969
Item 13	3.17	0.909	-15.787	0.446**	0.969
Item 14	2.91	0.981	-15.134	0.429**	0.969
Item 15	3.61	0.648	-14.795	0.589**	0.968
Item 16	3.48	0.669	-18.870	0.629**	0.968
Item 17	3.44	0.686	-22.803	0.671**	0.968
Item 18	3.35	0.753	-23.778	0.628**	0.968
Item 19	3.44	0.679	-23.623	0.683**	0.967
Item 20	3.49	0.661	-21.661	0.678**	0.967
Item 21	3.58	0.616	-23.938	0.769**	0.967
Item 22	3.52	0.691	-25.587	0.721**	0.967
Item 23	3.64	0.591	-21.262	0.747**	0.967
Item 24	3.57	0.627	-25.561	0.784**	0.967
Item 25	3.49	0.680	-27.559	0.735**	0.967
Item 26	3.24	0.851	-16.995	0.528**	0.968
Item 27	3.40	0.729	-24.491	0.617**	0.968
Item 28	3.42	0.717	-25.292	0.702**	0.967
Item 29	3.51	0.673	-23.341	0.701**	0.967
Item 30	3.50	0.660	-25.973	0.665**	0.968
Item 31	3.48	0.692	-26.780	0.724**	0.967
Item 32	3.36	0.786	-23.100	0.584**	0.968
Item 33	3.64	0.562	-20.003	0.696**	0.967
Item 34	3.62	0.565	-21.131	0.678**	0.968
Item 35	3.58	0.638	-22.500	0.719**	0.967
Item 36	3.63	0.612	-21.037	0.729**	0.967
Item 37	3.70	0.530	-20.179	0.680**	0.968
Item 38	3.74	0.526	-15.859	0.634**	0.968
Item 39	3.70	0.552	-18.080	0.667**	0.968
Item 40	3.75	0.509	-15.847	0.660**	0.968
Item 41	3.78	0.500	-14.321	0.666**	0.968
Item 42	3.74	0.525	-19.084	0.717**	0.967
Item 43	3.75	0.540	-16.364	0.649**	0.968
Item 44	3.75	0.498	-18.209	0.698**	0.968
Item 45	3.80	0.491	-13.711	0.665**	0.968
Item 46	3.73	0.573	-16.048	0.683**	0.968
Item 47	3.63	0.678	-18.401	0.581**	0.968
Item 48	3.56	0.711	-19.450	0.589**	0.968

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Table 2 (continued)

Items	Mean	SD	CR	Item-total correlations	Cronbach's α if the item was deleted
Item 49	3.61	0.629	-19.292	0.640[**]	0.968
Item 50	3.56	0.651	-17.509	0.617[**]	0.968
Item 51	3.51	0.700	-18.299	0.619[**]	0.968
Item 52	3.16	0.912	-19.474	0.541[**]	0.968
Standard			**≧3.000**	**≧0.400**	**[a]0.968**

The PaCT-HCW-C: the Chinese version of the Patient Participation Culture Tool for healthcare workers

SD standard deviation, *CR* critical ratio

[**] *p* < 0.01

[a] The Cronbach α of the PaCT-HCW-C was 0.862

four-point Likert scale (1: strongly disagree; 4: strongly agree), with a total score range of 44–176.

Discussion

This study provides a more context-appropriate tool for assessing patient participation culture from nurses' point of view based on a sample of 812 clinical nurses in Henan Province, China. All participants stated that the scale items were easy to comprehend, which indicates that the PaCT-HCW-C is a feasible, user-friendly quantitative tool for clinical nurses.

An increasing body of research has attested to the benefits of patient involvement in patient safety initiatives in healthcare [4, 31]. International organizations aiming to improve patient safety encourage patients to participate in their care [16]. As the core strength of healthcare workers, nurses play an irreplaceable role in advocating for patients to participate in disease management and patient participation could also improve work engagement, nurse job satisfaction, and helping behaviors [32, 33]. In order to get deeper insight into these issues and take specific steps to solve them, this research develops a more context-appropriate instrument for measuring patient participation.
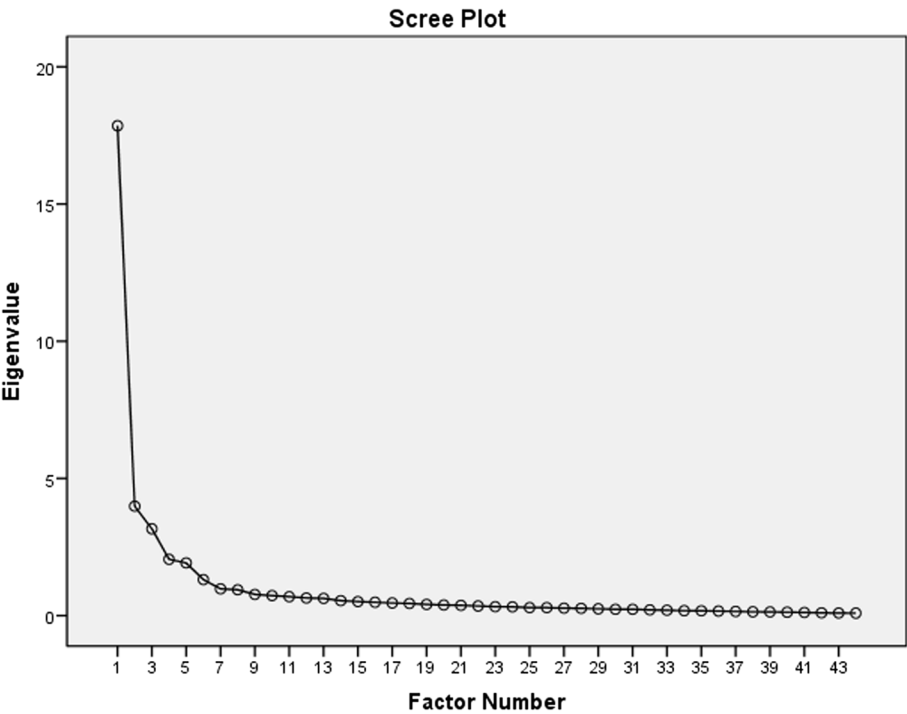

Fig. 1 Scree plot of the six-factor model

Table 3 Results of the final EFA of the PaCT-HCW-C with 46 items ($n = 406$, group A)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Factor 1: 能力 (Competence)						
1.我认为我有把相关信息通知到患者的能力 I feel competent to inform the patient	**0.793**	0.120	0.057	0.212	0.222	0.116
2.我认为我有征求或咨询患者意见的能力。 I feel competent to ask advice from or consult the patient	**0.805**	0.271	0.075	0.146	0.189	0.125
3.我认为我有将医疗过程中的一些问题的决策权交给患者的能力 I feel competent to delegate power to the patient concerning several topics of the healthcare process	**0.519**	0.336	0.071	0.257	0.114	0.066
Factor 2: 支持 (Support)						
4.医院的管理层创造了一个有利于提高患者参与度的工作环境 The management of the hospital facilitates a working environment that supports patient participation	0.133	**0.724**	-0.044	0.236	0.161	0.084
5.医院管理层的行为证明了患者参与的重要性 The actions of the hospital management illustrate that patient participation is an important issue	0.140	**0.753**	0.077	0.283	0.165	0.121
6.我的领导对患者参与持积极的态度 My supervisor has a positive attitude towards patient participation on the ward	0.122	**0.765**	0.080	0.222	0.207	0.118
7.当我让患者参与到治疗过程中时, 我的领导对此表示赞赏 My supervisor shows appreciation when I let a patient participate	0.135	**0.704**	0.008	0.135	0.209	0.127
8.我的领导会考虑员工的建议以提高病房患者的参与度 My supervisor takes into account suggestions of employees to improve patient participation on the ward	0.098	**0.770**	0.005	0.220	0.195	0.053
9.我的领导会分享我们在提高患者参与度上所获得的成果 My supervisor shares the results we achieve concerning patient participation	0.090	**0.823**	0.103	0.244	0.121	0.123
10.我的同事们会相互支持以便让患者参与到治疗过程中来 Colleagues support each other in letting patients participate in the healthcare process	0.040	**0.756**	0.062	0.258	0.205	0.165
11.我的领导会亲自参与制定与患者参与相关的任务或构想 My supervisor is personally involved in shaping a mission/vision concerning patient participation	0.023	**0.795**	0.011	0.292	0.071	0.154
Factor 3: 对"时间不足"的感知 (Perceived lack of time)						
12.人员配备不足降低了患者的参与度 Insufficient staffing reduces patient participation	0.089	-0.011	**0.896**	0.170	0.198	0.102
13.病房所面临的压力影响了患者的参与度 Pressure on the ward influences patient participation	0.100	0.038	**0.885**	0.202	0.179	0.080
14.患者参与导致患者近期个体化护理时间减少 Patient participation leads to short term loss of time in the individualized care of the patient	-0.010	0.148	**0.783**	0.300	0.043	0.126
Factor 4: 信息共享和对话 (Information sharing and dialogue)						
16.上周, 我告知了患者其患病原因 During the last week I informed patients about the causes of their disease	0.182	0.147	0.085	**0.695**	0.146	0.051
17.上周, 我告知了患者其疾病可能的治疗方案 During the last week I informed patients about the possible treatment options for their disease	0.078	0.190	0.120	**0.758**	0.119	0.056
18.上周, 我告知了患者医院在其疾病方面所取得的进展 During the last week I informed patients about the results the hospital achieved concerning their illness	0.058	0.202	0.056	**0.730**	0.096	0.073
19.上周, 我告知了患者其疾病可能导致的后果 During the last week I informed the patient about the possible consequences of their illness	0.108	0.274	0.126	**0.768**	0.095	0.031
20.上周, 我告知了患者其检查或治疗的结果 During the last week I informed patients about the results of their tests or treatments	0.057	0.154	0.043	**0.787**	0.220	-0.006
21.上周, 我在检查或治疗前告知了患者这样做的原因 During the last week I told patients before a test, examination or treatment why it was needed	0.190	0.212	0.088	**0.713**	0.319	0.091
22.上周, 我在检查或治疗前告知了患者这样做可能带来的后果 During the last week I told patients before a test, examination or treatment what the possible consequences are	0.063	0.230	0.078	**0.692**	0.199	0.107

Table 3 (continued)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
23.上周, 我在检查或治疗前征得了患者的同意 During the last week I asked permission to a patient before I did a test, an examination or a treatment	0.157	0.235	0.107	**0.661**	0.323	0.065
24.上周, 我向患者解释了哪些是他们可以决定的问题 During the last week I explained to patients on which items they could decide	0.133	0.218	0.065	**0.751**	0.288	0.117
25.上周, 我鼓励患者对在其检查或治疗中出现的问题 (共同) 做出决定 During the last week I stimulated patients to (co-) decide about the choices that had to be made in their tests, examinations or treatments	0.176	0.269	0.051	**0.720**	0.127	0.185
28.上周, 我试图了解患者对其带病生活方面的期望 During the last week I tried to understand the patient's expectations concerning the daily living with the disease	0.027	0.212	0.129	**0.703**	0.104	0.242
29.上周, 我告知了患者其出院后的治疗方案 During the last week I informed patient concerning their treatment after their dismissal from the hospital	0.067	0.106	0.093	**0.742**	0.196	0.223
30.上周, 我询问患者是否做好了出院准备 During the last week I asked patients if they felt ready for dismissal	0.016	0.071	0.058	**0.732**	0.126	0.296
31.上周, 我就出院安排方面咨询了患者的意见 During the last week I consulted patients concerning their opinions about the dismissal moment	0.006	0.167	0.124	**0.730**	0.190	0.208
32.上周, 我鼓励患者与患相同疾病的病友进行联系 During the last week I stimulated patients to contact peers	-0.039	0.141	0.118	**0.606**	0.063	0.285
Factor 5: 对问题的回应 (Response to questions)						
37.当患者询问某项操作如何进行时, 我会积极回答他们的问题 I am positive towards patient asking: "how a certain procedure is executed"	0.140	0.115	0.068	0.361	**0.654**	0.140
38.当患者询问其所服药物是否正确时, 我会积极回答他们的问题 I am positive towards patient asking: "whether the medication they receive is correct"	0.157	0.187	0.072	0.202	**0.700**	0.121
39.当患者询问医务人员的名字以及这些医务人员要做什么时, 我会积极回答他们的问题 I am positive towards patient asking: "what the name of the healthcare worker is and what they are about to do"	0.062	0.180	0.064	0.232	**0.707**	0.216
40.当患者询问为什么医务人员移除了某件医疗器械时, 我会积极回答他们的问题 I am positive towards patient asking: "why a healthcare worker removes an apparatus"	0.044	0.146	0.070	0.171	**0.841**	0.155
41.当患者询问医务人员是否洗了手时, 我会积极回答他们的问题 I am positive towards patient asking: "if the healthcare worker has washed his or hers hands"	0.080	0.182	0.095	0.123	**0.855**	0.191
42.当患者认为医疗过程中发生了某种错误并就此提出疑问时, 我会积极回答他们的问题 I am positive towards patient saying: "if they think a fault has happened"	0.096	0.179	0.045	0.259	**0.739**	0.271
43.当患者提出尚未收到其检查结果时, 我会积极回答他们的问题 I am positive towards patient saying: "they have not received the results of their tests yet"	0.052	0.172	0.063	0.188	**0.759**	0.246
44.当患者认为他们的伤口发生了感染并就此提出疑问时, 我会积极回答他们的问题 I am positive towards patient saying: "if they think their wound is infected"	0.042	0.158	0.065	0.230	**0.771**	0.260
45.当患者的腕带丢失或被移除并询问该如何处理时, 我会积极回答他们的问题 I am positive towards patient saying: "if their identification bracelet is lost or removed"	0.142	0.172	0.137	0.125	**0.814**	0.231
Factor 6: 接受新角色 (Acceptance of a new role)						
47.我认为把医院层面关于患者安全的进展告知患者是件很重要的事情 I regard it as important to inform patients about the results of the hospital regarding patient safety topics	0.070	0.122	0.091	0.115	0.281	**0.809**
48.我认为如果医院发生了安全方面的事故, 且与患者相关时, 把此事告知患者是件很重要的事情 I think it is important to inform patients regarding a safety incident when they are a part of this incident	0.031	0.081	0.080	0.177	0.285	**0.791**
49.当患者要记录关于患者安全方面的事情时, 应支持他们 Patients should be supported to make their own notes regarding patient safety	0.123	0.141	0.091	0.160	0.348	**0.750**
50.在我印象中, 病房里的患者都想就患者安全方面的问题尽一份自己的责任 I have the impression patients on our ward want to take responsibility regarding patient safety	0.029	0.193	0.030	0.243	0.205	**0.768**

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Table 3 (continued)

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
51.在我印象中, 患者敢于提出与患者安全有关的问题 I am under the impression that patients dare to ask questions concerning patient safety	0.076	0.270	0.079	0.199	0.218	**0.698**
52.在患者安全问题中, 患者的角色越重要, 就越会对医患关系造成负面影响(反向计分) A more important role for patients in patient safety issues could have negative effects on the healthcare worker-patient relationship (REVERSE)	0.093	0.061	0.037	0.260	0.269	**0.486**

The PaCT-HCW-C: the Chinese version of the Patient Participation Culture Tool for healthcare workers; factors with loadings ≧ 0.40 were bold

The PaCT-HCW-C has high content validity as determined by the study, with both the inter-rater and intra-rater reliability coefficients (I-CVI and S-CVI) meeting statistical requirements.

According to item analysis, all items evaluated the same underlying concept since their item-total correlations were higher than 0.40. And because all of the CR values were over the cutoff value of 3.00, the PaCT-HCW-C was shown to have a high level of discriminatory ability with regards to patient participation culture aspects. Though Cronbach's α of the entire scale was increased 0.01 after item 12, 13 or 14 was removed, it does not meet the criteria for deleting items. The item-total correlations for each item in the analysis were substantially over 0.40, demonstrating that the items measured the same underlying concept. A substantial discriminative ability of the PaCT-HCW-C for aspects of patient participation culture of the participants was also shown, and the CR values were all greater than the 3.00 threshold. Even if the deletion of items 12, 13, or 14 raised the scale's overall Cronbach's α by 0.01, this does not fulfill the requirements for item deletion.

Within the EFA, double loadings were anticipated and tolerated. However, they can imply conceptual overlap between the factors and the items, which might result in worse factor differentiation and model fit [34]. In China, nurses must introduce their names and positions before each nursing operation, which may lead to an inappropriate factor load in Item 15. As the duration of pain and discharge time of patients is very uncertain, Chinese nurses usually avoid answering such questions directly, which may lead to items 33 and 34 not only belonging to factor 5 (Factual Questions) but also belonging to factor 4 (Information sharing and dialogue). As a result of the initial EFA's improper factor loading, eight elements were eliminated. In addition, factors 5, 6, and 7 in the original PaCT-HCW belong to different types of problems, but they merged into one factor in this study. This may be because nurses are not sensitive to the discrimination of problem types under

the Chinese cultural background. According to the final EFA results, the total variance explained by the six-factor structure of the PaCT-HCW-C were over the borderline of the recommended range (> 50%) which was higher than the original scale conducted in Belgian participants [6].

The CFA demonstrated that the PaCT-HCW's initial eight-factor structures [6] did not give an acceptable fit for the study data. However, the results demonstrated a strong match for the six-factor structure constructed following the study's final EFA. No items were eliminated in this approach since the six-factor model's goodness of fit improved following the modification. The similarities between the items, however, allowed for the display of correlations between some residuals. The six-factor model demonstrates a reduction in the number of subscales and items compared to the original eight-factor structure, thereby simplifying the initial framework [6].

In this investigation, the PaCT-HCW-C generally showed excellent dependability, indicating that the PaCT-HCW-C's internal consistency was good, the Cronbach's α for the total scale and its six subscales were 0.962 and ranged from 0.748 to 0.966, respectively. This was only marginally better than the original version's values of 0.92 for the total scale and 0.67 to 0.93 for the subscales. The split-half reliability of the PaCT-HCW-C was satisfactory, except for the Competence subscale, which had a split-half reliability of 0.625. All other subscales and the overall scale had split-half reliability values of more than 0.7. The PaCT-HCW-C's excellent stability in measuring the healthcare worker-related elements of patient participation culture from the nurses' perspective was demonstrated by its high test–retest reliability. Additionally, compared with the Patient Participation Culture Tool for inpatient psychiatric wards (PaCT-PSY) [15] which was used to measure the patient participation culture on psychiatric wards, PaCT-HCW-C was tested its effectiveness in groups of nurses in different types of wards, future research could test and compare the psychometric
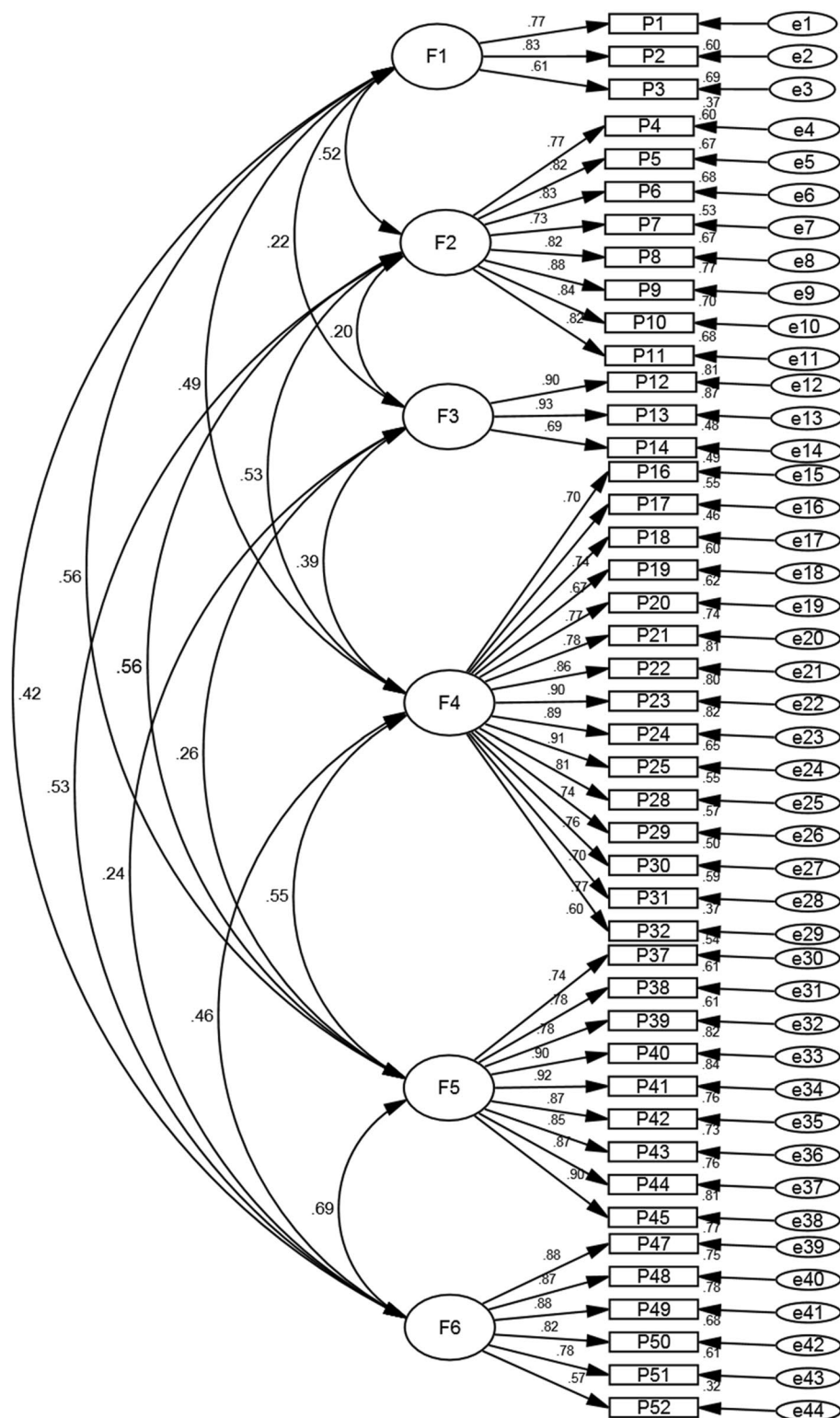
Fig. 2 Confirmatory factor analysis of the six-factor model of the Chinese version of the PaCT-HCW (*n* = 406, group B). F1: Competence, F2: Support, F3: Perceived lack of time, F4: Information sharing and dialogue, F5: Response to questions F6: Acceptance of a new role

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Table 4 Internal consistency and split-half reliability of the PaCT-HCW-C (*n* = 812)

Classification	Number of items	Mean	SD	Cronbach's α	split-half reliability
Competence	3	10.82	1.449	0.748	0.625
Support	8	27.80	4.689	0.938	0.924
Perceived lack of time	3	9.24	2.552	0.883	0.728
Information sharing and dialogue	15	52.25	8.033	0.956	0.919
Response to questions	9	29.90	3.552	0.953	0.916
Acceptance of a new role	6	21.04	3.501	0.896	0.850
The PaCT-HCW-C (total)	44	154.84	18.366	0.962	0.866

The PaCT-HCW-C: the Chinese version of the Patient Participation Culture Tool for healthcare workers

SD standard deviation

Table 5 Test–retest correlations of the PaCT-HCW-C (*n* = 50)

Classification	Number of items	ICC	95% CI
Competence	3	0.814	[0.674–0.894]
Support	8	0.922	[0.864–0.956]
Perceived lack of time	3	0.971	[0.949–0.984]
Information sharing and dialogue	15	0.987	[0.977–0.993]
Response to questions	9	0.975	[0.957–0.986]
Acceptance of a new role	6	0.971	[0.949–0.984]
The PaCT-HCW-C (total)	44	0.989	[0.980–0.994]

The PaCT-HCW-C: the Chinese version of the Patient Participation Culture Tool for healthcare workers

ICC Intraclass correlation coefficients, *CI* confidence interval

properties of the PaCT-HCW-C in nurses of different job types.

In addition, existing research has identified certain demographic characteristics of nurses that influence their willingness to engage in patient participation, utilizing tools such as the PaCT-HCW [35]. Future studies should value nurses' experiences in patient participation and focus on providing patient participation-specific basic and ongoing education to support nurses in fulfilling their own roles [36, 37].

Limitations

The study has several limitations. Only a tiny portion of the sample was male, owing to China's unique cultural setting and the inherent role perceptions within the nursing profession, which may impact the sample's representativeness. Additionally, in this investigation, the PaCT-HCW-C generally showed excellent dependability, indicating that the PaCT-HCW-C's internal consistency was good, the Cronbach's α for the total scale and its six subscales were 0.962 and ranged from 0.748 to 0.966, respectively. This was only marginally better

than the original version's values of 0.92 for the total scale and 0.67 to 0.93 for the subscales. While the Cronbach's α value of 0.962 indicates a high level of internal consistency among the items, suggesting potential redundancy, we opted to retain all items for comprehensiveness. However, this approach may inadvertently introduce redundant items, thus potentially affecting the precision of measurement.

Conclusions

This study established a 44-item PaCT-HCW-C's validity and reliability, indicating that the scale may be useful for assessing patient participation culture from the viewpoint of Chinese nurses. And the PaCT-HCW could provide nurse managers with a new tool for assessing patient participation culture that is more suitable for nursing situations, which has a positive effect on improving the quality of patient-centered nursing services. In addition, further investigation is necessary because this is the first study to adapt and evaluate the PaCT-HCW-C's validity and reliability in China. And in the future, the PaCT-HCW-C may

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be used to assessing the effectiveness of patient participation promotion program which conducted at an international level and disseminate China's practical experience.

Supplementary Information

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Supplementary Material 1.

Authors' contributions
Author Contributions Statement Conception and design: Wenna Wang, Zhenxiang Zhang; acquisition of data: Wenna Wang, Qianqian Sun, Chenxi Zhou; analysis of data: Wenna Wang, Yongxia Mei, Chenxi Zhou; drafting of the manuscript: Wenna Wang, Shanshan Wang; Review of the manuscript: Shanshan Wang, Qiushi Zhang, Zhenxiang Zhang. All the listed authors have given final approval of the version to be published.

Availability of data and materials
Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate
The study was approved by the Ethics Committee of Zhengzhou University (No. ZZUIRB2022-82). All methods utilized in this study strictly adhered to ethical guidelines and regulations in their entirety. We informed all participants in advance about the study's purpose and procedures prior to conducting the survey, ensuring that informed consent was obtained from all research participants.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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